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REIMAGING RESOURCE CONSTRAINTS AND AFFORDANCES:

SMALLHOLDER, ENVIRONMENT AND STATE DYNAMICS IN WELLO, ETHIOPIA

by

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For

My late father, Gashaw Debalke,

My mother, Abesha Hailu, and

My aunt, Messelech Dessalegn

ABSTRACT

In this dissertation, I explore and analyze smallholders' perceptual and cultural understandings of environmental opportunities and constraints regarding land, soil, rain and trees in mixed-crop-livestock agriculture among rural communities of Wärräbabbo in Wello, northeast Ethiopia. Also, I identify, examine and analyze their responses mainly to drought, de-vegetation, soil erosion, land scarcity and food shortage. Based on a processual ecological anthropology, I argue that their understandings and responses are informed not only by their culture and their immediate environment but also by the external environment existing beyond their direct knowledge and experience. Thus, inasmuch as they do not live in isolation from regional, national and international contexts, I argue that conditions largely beyond local influences and experiences like land tenure and relief aid need to be considered. Based on these findings, I discuss the ongoing shift from a traditional "ecocentric" to an anthropocentric valuation of the environment and its resources and constraints, including changes in the notion of resources from given to investible entities. In this regard, I demonstrate that small farmers' perceptions, adaptive thoughts and cultural behaviors, including traditional ecological knowledge, though still distinct in many ways, yet are partly and slowly changing and converging with that of the state-model. Nonetheless, I stress that such a convergence does not necessarily result in better or ecologically superior resource management practices. In all cases, my work verifies the theory that, in the long run, consciousness and

knowledge alone are not sufficient to diagnose and respond to environmental constraints and opportunities unless what is considered ‘normal’ is kept on a constant doubt. Combining history not only with ethnography but also some aspects of linkage to higher level organizations, I discuss how environmental resources and constraints are not just empirical experiences but also matters of social construction. I underline that the need to be ecological in the human-environment relation has to be an intrinsic value of our environmental ethics or our sense of being human rather than a mere time-framed project. Over the years, the communities I studied have been combining survival and sustainability, potentially affecting existing approaches of understanding environmental affordances and constraints.

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LIST OF ABBREVIATIONS

AD	(Agricultural) Development Agents
ACSI	Amhara Credit and Saving Institution
AI	Artificial Insemination
ANRS	Amhara National Regional State
ANRSIB	Amhara National Regional State Investment Bureau
CSA	Central Statistical Agency
FAO	Food and Agricultural Organization
FHH	Female headed household
FSC	Farmers' Service Cooperative
FTC	Farmers' Training Center
HABP	Household Asset Building Program
IPM	Integrated Pest Management
IEK	Indigenous Environmental Knowledge
IK	Indigenous Knowledge
MHH	Male Headed Household
MERET	Managing Environmental Resources to Enable Transitions to more Sustainable Livelihoods
MOA	Ministry of Agriculture
NGO	Non-governmental Organization
PA	Peasant Association
PSNP	Productive Safety Net Program
m.a.s.l	Meters above sea level
TEK	Traditional Ecological Knowledge

WDARDO	Wärräbabbo District Agriculture and Rural Development Office
WSK	Western Scientific Knowledge

GLOSSARY OF LOCAL TERMS

Abdal	Village guardian spirit
Abbabidra	Local landlords of the past
Abbat addär	Indigenous, traditional
Addunia	Worldly life
Afärä k'ällal	Area or land with a shallow top-soil
Afärä käbbad	Area or land with a deep top-soil
Akkababi	Environment (the social environment primarily)
Akkababi t'ïbbäk'a	Environmental protection (the social environment primarily)
Akira	The After Life
Andalläf	Inter-year fallowing
Angač	Palace guards who were given land in lieu of their security services
Anša	Land left in fallow for some years before getting bush re-growth
Aränza	Land /soil with many rocks in it
Arïso šäšš	The practice of cultivating fields far from home village but within a distance that allowed getting back home in the evening
Ašabo	Salt
Ašara koffé	Sandy soil or land
Ayama	The plowing following the first in seedbed preparation
Ayïnïnnas	The personal wish or crave to use or own something belonging to others

Bïllagi	The season during which the minor rains fall from mid-February to mid-March
Balabat	Landlord
Bodda	Most fertile land or soil
Bosäbos	Most fertile land or soil
Boy	Furrow-like long depression dug to drain away excess water out of a farm land
Çinça märét	Infertile land
Çärärta	Lightening
Çoräs	The crop disease known as uziz
Çat	A mild-stimulant tree crop whose leaves and tender twigs are chewed for their stimulating and hilarious effects
Çinça	Poor or least fertile soil
Dergue	The military junta that toppled Emperor Haile Sellassie I and ruled the country from 1974-1991, also known as the Provisional Military Administrative Council until September 11, 1987 when it turned itself into a civilian government
Däbo	A local work party for agricultural and other activities organized by those who could throw a feast for the party
Däga	A temperate climatic zone
Däwla	Spirited or ideal wind believed to affect the impact of drought/famine on humans and livestock
Dïb	Bund built by the ancestors
Dingay t'ala	Land/soil with some rocks in it

Dïrk'	Drought, and also famine by extension
Du'a	Prayer made by an individual or a small group
Duga	Small trench dug to trap flood waters and moving soils
Fäläma	The ritual starting of the digging of a gravesite
Fida	Misfortune befalling the person, family or property of an individual
Gäbbar	A tax-paying farmer operating his holding
Gäbäré	A farmer (working on own labor), sometimes exclusively used for hardworking farmers
Gïbrïnna	Farming
Gama	A condition in which desired cool current of air is blocked from field crops by physical barriers such as bunds and trees
Gämäd	A unit of measure equal to 20, 25 or 30 linear meters and applied to measure land during the land redistribution of 1984 in Gäddärro and Wärräbabbo at large
Gämït't'oš	A sharecropping arrangement in which the tenant cleared and cultivated for some years bushy or cultivated 'virgin' land or land left in long fallow and in which the tenant took all the harvest in return for taming the land as a cropland
Gät'aba märét	Severely eroded and infertile land with inadequate soil to be dealt by plow or other digging instruments

Ǧigi	A local work party for agricultural and other activities organized by those who could throw a feast for the party
Gosa	Clan or maximal lineage and also used to refer to the village corporation irrespective of kinship
Got'	Village
Gïmïša	The first plowing in seedbed preparation
Gult	Fief or fief holding rights (untaxed estate granted for a lifetime)
Gulgualo	Harrowing
Gurïmïrïmta	Thunder
Ǧuzan	A skin disease believed to be caused by eating onions
Kab	Bund
K'äççé zämač	Campaigners during the reign of Menelik II
Kïnnïn	Tax tariff levied on a land during the feudal period
K'oti	A local, traditional chief to resolve conflicts and other issues based on religious or rather that secular powers or the decorated symbolic stick kept by such a man
Hamba	Leftover
Haräm	Weeds but also used as important livestock feed
Hid tagär	Environmental conditions that entice villagers to leave their homeland whereas other environmental conditions predispose them to stay in the homeland
Holläta	Malaria

Ïddari	Uncultivated land (yet theoretically)
Ïnğära	Thin round pita-like bread consumed as a traditional staple food by many Ethiopians
Ïrbo	A sharecropping arrangement in which the tenant took two-third of the produce while the landlord got one-third of it
Ïrzïk'	Fortune, blessing believed to begotten by chance rather than merit.
Kab	Stone bund used as a SWC measure
Kïrämït	The season during which the major rains fall from mid-June to mid-September
K'iré	Village self-help association known by the term *ïddïr* in many other parts of Ethiopia
K'ïrn	A miasmic gas released after rain falling on hot surface of air
Kïrrït	Check dam, one of the modern SWC structures
K'olla	Lowland with a hot climate
K'olo	Roasted grain crops used as food
K'uiama	The Final Day
K'unna	Local measure equivalent to eight kg
K'ut'ïb	Village guardian spirits
Lamba	Kerosene
Lambé	The crop disease known as uziz
Lam afär/märét	Fertile soil/land
Lïğbäll	A sharecropping arrangement between a married son and his father in which the son took one-third of the harvest

Mänäyyät	Contributing money for a collective prayer
Mäğärräb	Taking lesson from past environmental experience and acting now in order to improve the future
Mäggazo	A generic term for sharecropping arrangement
Mändär	Village, hub of an environment
Mäzualäm	Lack of love, goodwill, respect and cooperation among villagers
Mäwwafäk'	Love, goodwill, respect and cooperation among villagers
Mofär zämmät	The practice in which highlanders left their homes for a certain period with their farm implements and seeds and sharecropped as tenants with lowlanders before the practice was banned by the 1975 Land Reform
Mïsïläne	Local representative of higher level administrators of the feudal system
Muhäkkäl	Scapegoat
Näççïläbaš	Non-uniformed reserve army of the late period of Emperor Haile Sellassie I
Naim	A sheik
Nïrfo	Boiled grain crops used as food
Nur tagär	Environmental conditions that entice villagers to stay in their homeland whereas other environmental conditions predispose them to leave the homeland
Račča	The condition of consuming crops on piecemeal basis before harvest is collected; the crops could be consumed in full leaving no harvest in the end

Rïst	Hereditary taxed estates/hereditary land rights
Rïstä-gult	Hereditary *gult* rights
Sädäk'a	Alms
Sämon gäbbar	A priest who were in possession of land granted by government in lieu of his religious service in a church or monastery
Säïfa ïrïša	Diagonal tillage
Šärt'	Duty or responsibility to be fulfilled as in those required to render agriculture productive
Sïbbät	The tip of a plow; the deep inner most part of the top soil
Siso	One-third, a sharecropping arrangement in which one-third of the produce is taken by the landlord
Täfät'iro	Nature, symbolized usually in rain
Tïkïlläña	Tax collectors of the feudal system who used to be stationed at villages
Täläma	This is a traditional practice in which each village had a ritual figure that started planting of the major agricultural season. Ritual feats, *çat* chewing and collective prayers were involved in the process at the home of the ritual leader. This used to be part of the traditional ritual fertility which is no more today. There are households doing it on their own.
T'ämäk'	Tree branches, leaves, grasses or other cut plants used to prevent a starting rill erosion from growing further

Wädağa	A traditional collective prayer practiced by Muslims
Wäf arraš	Wild plant
Wäina däga	Sub-tropical climate
Wağib	A religious requirement
Wäk'ït	Time or season- a line of perception in which villagers interpret all changes around them and beyond through the change of time
Walka	Clayey land or soil
Wïrma	Dense vegetation, bush or bush land
Wäina däga	Sub-tropical climate
Wağib	Things allowed or preferred to do in religion
Wïha gäbb	Marshy or irrigable land
Wuğu	Corvée labor
Yabïddïr afär	Credit soil that is transported from other places and deposited in another place where it could be agriculturally useful
Yäçinät	The exchange of oxen labour for grain crops
Yägäbbar märét	Land possessed by a tax payer
Yägärafi	Exchange of oxen labour for crops
Yällabi	The keeping of a she animal with a person who cares for it and its offspring in exchange for her milk and milk products
Yänäçläbaš märét	Land granted to local militia men recruited towards the end of the Imperial Haile Selassie regime
Yäna'im märet	Land granted to a sheik in the feudal system
Yangač märét	Land granted to palace guards and servants

Yärrïbbi	The keeping of a she animal with a person who cares for it and its offspring which later are shared equally between the owner and the herder
Yaškär madäria	A parcel of land earmarked by a landlord for the temporary provisioning of his servants
Yäsämon gäbbar	Tenant sharecropping land possessed by a church or priests serving churches
Yazïnab dïrk'	An oxymoronic expression to refer to excess rain that results in negative effects as drought; literally it means "rain-born drought"
Yäwakkarra märét	Land collectively held by communities as pasture during the feudal system
Zär makïrämia	A practice in which a piece of land is allocated to planting a crop not for consumption but just to ensure seeds for the next planting season
Zat	The human flesh
Zäkha	Alms, one of the five pillars of Islam
Zämač	Reserve army of the feudal system who were given land in return for their free military service when called upon
Zämač gäbbar	Local militia men who were given land in lieu of their security and military service when called on by government during the feudal system
Zär makïrämia	A practice in which a piece of land is allocated to planting a crop not for consumption or sale but just to ensure seeds for the next planting season
Zat	The human flesh

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CHAPTER ONE: INTRODUCTION: SETTING, PROBLEM AND OBJECTIVE

1.1 The Setting

1.1.1 Brief Environmental Historical Introduction to Ethiopia

This dissertation is about the general topic of human-environment relations among farming communities in the northeastern highlands of Ethiopia. In its "realistic" but least known history or imagery, the country used to receive tremendous exaltations for its environmental ambience, agricultural resourcefulness and amazing flora and fauna, mostly in the accounts of travelers and missionaries (Huffnagel, 1961; Pankhurst, 1961; McCann, 1995). The Greeks called it "cool celestial island" (Hancock, 1985, as cited in McCann, 1995). Geographers still describe her as "the water tower of east Africa". Pankhurst quotes men like Ibn Fadl Allah, Brother Raphael and Almeida (in the 14th century) who described the profuse cultivation of wheat, *teff*[1], chick-peas, lentils and other cereals in the Ethiopian highlands (1961). He also quoted Almeida as writing, "this country is very fertile, for in some parts it yields two or three crops a year, though the energy and effort of the farmers put into cultivating is not great"[2] (Pankhurst, 1961, p. 200). Francisco Alvares, the Portuguese traveler who visited Ethiopia in the 16th century, wrote "It seems to me in all the world there is not so populous a country, and so abundant in corn, and herds of innumerable cattle" (as cited in McCann, 1995, p. 3). About a century later, in 1626, another Jesuit Fellow wrote, "The climate is so temperate that at the same time I saw in some places ploughing and sowing, and in others the wheat already sprouting, while in others it was full-grown and mature, in others reaping, threshing, gathering, and again sowing, the land never tiring of continual production of its fruits or failing in

[1] The Merriam Webster's Collegiate Dictionary defines it as an economically important Ethiopian annual cereal grass (*Eragrostis tef* syn. *E. abyssinica*) grown for its small grain which yields a white flour and as a forage and hay crop.

[2] The current generations in Wärräbabbo, where I did my ethnographic research, share this remark about their ancestors. Even today, many mentioned lack of determination for work or "laziness" as one of the factors of their underdevelopment.

its readiness to produce them" (Jerome Lobo 1629, as cited in McCann, 1995, p. 3). Richard Burton, who visited the city of Harar located in the escarpment towards the lowlands of east Ethiopia in the 19th century, described its heat as not being hot and its cold as not cold. Such additional accounts as "verdant" and "salubrious" had been used to describe the country (McCann, 1995, p. 4). Even in the mid-20th century, the country's potential had been well perceived by experts who regarded her as the "breadbasket of the Horn of Africa and the Middle East" (Cohen and Weintraub 1975, p. 1, as cited in Koehn, 1977, p. 2).

What is more, huge numbers of animals and abundant pastures as an important economic base have been well documented (Crummey, 2000; Pankhurst, 1961; Simoons, 1960). Animals thus documented included cows, sheep, goats, horses and mules. Mentioned from the side of the undomesticated were elephants, giraffes, lions, leopards and lynx, among others. In this regard, among Marco Polo's remarkable descriptions from the 13th century are "wild asses in plenty", "birds of many sorts unlike those found everywhere" and "enormous ostriches scarcely smaller than a donkey" (as cited in Pankhurst, 1961, p. 215). Today, the international scientific community has acknowledged Ethiopia as one of the nine original biodiversity centers in the world. I think the country still has its share in Africa's status "as sinks of tradable carbon, stores of biodiversity wealth, and symbols of cultural alterity" (Fairhead and Leach, 2003, p. 4). Yet, Ethiopia's landscapes and ecosystems are under threat. For example, although there is no strong evidence, the forest coverage believed to have been 40% of the country's landmass at the turn of the 20th century has been reduced to just 4 to 2.7 percents today. This is without mentioning recent reports (since 2009) that the forest coverage has increased up to 9 or 14 percents.

From history, therefore, we learn that the Ethiopian highlands largely used to be fertile and continually cultivated, supporting plenty of human, livestock and wildlife populations (Pankhurst, 1961; McCann, 1995; Simoons, 1960).

Unfortunately, in the second half of the 20th century, such beautiful appellations and their narrative images were paradoxically replaced by such lamentable descriptions as landscapes "burnt by drought", "people starved to death", farms reduced to "starvation plots" and a people suffering from an "inward march of famine", referring to the expansion of famine from the geographic margins into the highland core (Dessalegn, 1990, 1996; Mesfin, 1986). In this regard, the old Ethiopian adage *"when the periphery is trespassed, the center becomes periphery"* has already been long overdue. The country's name has thus been associated with drought and famine among the international community. In the face of plain world history that famine has occurred nearly everywhere, Svein Ege (1988, p. 156) has written the following: "Famine is, it should be emphasised, not limited to Ethiopia, although Ethiopia became *a symbol of the tragedy of Africa* [emphasis added]".

The human effect on the environment, however, was serious even in the 19th century as forests and groves of trees were reportedly depleted in many highland areas (Salt, 1811, Plowden, 1868, as cited in Pankhurst 1961). Based on travelers' accounts and oral history, Stanislaw Chojnacki (1963) had attempted to reconstruct the recent deforestation history of the country focusing on the province of Shoa. According to his review, the landscapes in this province and what is now known as the highlands of Hararghe, largely presented de-vegetated and cultivated areas so that later travelers were bewildered by what they observed in contrast to earlier travelers who were surprised by admiration. Reviewing notes left by travelers who visited the country in the 19th century, Chojnacki concluded that cultivated landscapes and scanty forests were dominant features of particularly the Shoan landscape. Showing the progress of deforestation, Harris (W.C. Harris, 1844, as cited in Chojnacki, 1963), who, in 1841 went from Ankobar to present-day Addis Ababa, described the entire area as "a timberless realm" (p.33). A.E. Pease, an Englishman, was also quoted by Chojnacki describing what he saw as a

"country with nothing for the eye to rest on but the beastly mule caravan", after travelling for days from the eastern city of Harar towards Addis Ababa during his visit of Ethiopia from 1900-1901 (A.E Pease, 1902, as cited in Chojnacki 1963, p. 33). At a later date, in 1905, the landscapes around Addis Ababa and its eastern parts leading to Ankobar were described by a traveler called Dr. Paul Mérab as a "bare open country" (Mérab, 1922, as cited in Chojnacki, 1963, p. 33). According to the same review, however, Addis Ababa, including the area called Finfinné and to some extent, Ent'ot't'o, were constituted of fertile land and such trees as juniper, podocarpus, olive trees, castor-oil trees, a forest of thorny mimosas and some great sycamores. Most of these vegetations were quickly destroyed when the royal seat of Emperor Menelik II was relocated to Ent'ot't'o and later to Finfinné towards the end of the 19th century (Chojnacki, 1963).[3] Today, the southern parts of the country are ecologically better off than the northern. Unfortunately, as their northern compatriots, food and ecological crises have also become part of the life of people in the south, at times within deceptive settings aid communities once described as "the green hunger".

Chojnacki also depended on other travelers' documents in his reconstruction. All of these documents had emphasized large cultivation of land and lack of forests which indicate that there was high presence of human and livestock population even during that time. The writer envisages the probability for a temporary halt in the deforestation process and the reversion of cultivated landscapes to bush, if not forest, since the 16th century following the invasion of Ahmad Grañ and the occupation of the land by migrant Oromo and the decrease in the autochthonous Amhara population (Chojnacki, 1963).

Against this historical background, it still behooves to note the resourcefulness of the country for agricultural development even though the

[3] The writer had documented, "The sovereigns wandered from one region to the other, and their camps were transferred from one place to another as soon as stands of wood were exhausted. This was the usual procedure of the Shoan rulers in the nineteenth century and it is very probable that the procedure of their ancestors was the same" (Chojnacki, 1963, p. 32).

representation of environmental degradation continues clouding its remaining potentialities. After visiting the 'central plateau' and 'southern slope' of the country in early the 1950s, the then Director of Food and Agriculture Organization (FAO), was heard praising her agricultural potentials. A book written by the then Ministry of Agriculture (MoA) said, "in informal conversation after his return from a field survey, he remarked that the area could only be compared to the corn belt triangle in the Mid-West of the United States and to the rich corner of Queensland in Australia" (1953, p 5). The same document bears this description: "The Ethiopian plateau is a country with rich soil, an equable climate and a good rainfall" (1953, p. 9).[4] Ample and fertile land as well as favorable climatic conditions for the production of diverse crops and livestock have been documented as the 'greatest' and then 'only important resources' of the country (Huffnagel, 1961, p. 133). At a more recent time, Peter Koehn wrote, "On the whole, Ethiopia possesses rich natural endowments that are favorable for food production, including large size, variety in terrain and elevation, fertile soil, and adequate rainfall" (1977, p. 102). Following Liebental (1976, p. 3), Koehn had also reaffirmed the agricultural resourcefulness of the country, especially in reference to the central plateau, including those of Arsi and Bale, the western regions such as Keffa, Wellega and the Blue Nile gorge area shared by Shoa, Gojjam, Wello and other regions (1977, p. 102).

In recent years, the national Rural Development Policy (and Strategies) of the Government of the Federal Democratic Republic of Ethiopia (FDRE, 2003) has represented land, water and unskilled labor as the most important resources of the country to be developed to achieve food security and national economic development. Today, there seems to be no part of the country

[4] The still remaining potential of mountain and hilly areas in Ethiopia compares with the rest of Africa which have also been supporting high number of population and mixed crop-livestock agriculture (Hurni, 1993, pp. 38-39). These areas still have opportunities for sustainable development despite the 'subsistence management of natural resources' they have been practicing and provided that appropriate measures such as soil conservation, irrigation and better marketing strategies are employed (Hurni 1993, p. 39).

without some problem of deforestation, soil erosion, drought and at times excess rain, perhaps except in the lowlands. Nonetheless, many areas, as already mentioned, still have high agricultural potentialities. The literature shows contradiction between direct empirical perception (of physical or material conditions) and cultural representation of the environmental destructions and potentials of Ethiopia. Accordingly, a true historiography of the environmental past and present of the country (and even its environmental outlook) is confounded between empiricism (experiencing physical or material conditions) and representation.

What is more, environmentalism in Ethiopia and the entire Africa has taken a different course to that in the West. That is why in some of the literature conflicts are reported when the two ethno-ecologies meet. In Ethiopia, as in the rest of Africa, environmentalism is largely about people threatened by food shortages and the incapacity to cope with natural problems affecting crops, livestock and human health. Ethiopian environmentalism does not deny that the flora and fauna need to be protected (FDRE, 1997). Of course, this has been one of its concerns, but implementation gives precedence to human beings around the basic necessities of survival.[5] As part of mitigating the human dimensions of environmental and climate change (especially famine and food insecurity), international development, relief aid, and land reclamation have long become the shadows from which new trans-cultural responsibilities are allocated to traditional resource users in rural Ethiopia. These inputs and their discourses have been affecting the country from the central policies developed at country-level to the micro-politics and techniques of managing individual household plots and livestock. In this regard, the country presents a long and diverse history of cultural, bio-

[5] This is a fundamental paradox and contradiction of the environmental quest not only in developing countries but also in the developed ones where not basic needs but excessive consumerism threaten ambient human-nature relationship. Notwithstanding the current positive environmental mitigation measures or at least heightened sensitivities, this contradiction is likely to continue for a long time.

physical, and local-national-global interaction affecting smallhoders' adaptation and resilience to ever-changing environmental conditions.

The irony between environmental experience and representation of Ethiopia is perhaps best represented in the following quotes from the MoA document already cited. It goes as

> The increase in world population is often compared with the increase in world supply of food. Many observers fear that there will be a time, not many years in the future, when there will be an acute world wide shortage in the food supply. Ethiopia's position will be particularly important in that event because of her vast expanse of fertile farm land in the midst of an area that is so preponderantly desert and non-productive. (1953, p. 17)

One of the major challenges of Ethiopian environmentalism is still to solve this paradox and lead the country into a state of worthiness not only for its population but also that of the rest of the globe.[6] There is a long way to go to narrow the gap between experience and representation from country to village level. My conviction is that localized studies such as this will have some contribution in achieving this objective.

1.1.2 People and Area of the Research

From among the nine regional states and two city administrative councils in the current administrative structure, I selected the Amhara National Regional State (ANRS).[7] The region's long history of agricultural use of land, high population density, land degradation and occurrence of recurrent droughts and famines were among the reasons for choosing it.[8] Situated in the north parts of

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[6] The currently debated leasing of land by government to foreign investors engaged in commodity crops production, including grain crops in lowland parts of the country, might be the beginning of the revelation of the country's worthiness to the rest of the world provided that this is adequately accompanied by fully fledged national food security.

[7] I made this regional selection in December 2006 in the country based on earlier knowledge and some consultations with Ethiopian scholars.

[8] The choice of Ethiopia as a research site has more meaningful justification rather than just the convenience of studying one's own country. The country could be said to be the symbol of both affluence and deprivation in the history of human relationships to the environment. Being one of the sources of human origins, it also displays a prolonged history of human intervention on the environment. Therefore, by many standards, Ethiopia qualifies as one of the best places to situate such a research.

the country (northeast Africa), this region covers 16.4% of the total land area of Ethiopia that is about 1,000,000 sq. km. (ANRS, 2002). According to the Amhara Region Information Bureau (ARIB), the region is divided into 10 zones, 22 town administrative units, 128 districts *(wäräda)* and 3,429 grassroots administrative units known as *k'äbälé* (2009). It falls mostly in the northeastern and northwestern Ethiopian plateaus with more than half of its area lying 2,000 meters above sea level (henceforth m.a.s.l) (ANRS, 2002). It exhibits all the five broad climatic zones in the country, ranging from desert to cool alpine, a characterization based on altitude. The minimum average annual precipitation is 598.3 mm whereas the highest is 1692 (ARIB, 2009). The lowest average annual temperature is 12.4 degree centigrade whereas the highest is 27.8 (ARIB, 2009).

About 89% of the people of the region live in rural areas and depend on smallholder agriculture (ARIB, 2009). With 90 persons per sq. km., the region is the second densely populated in the country (ANRS, 2002), next to Oromia. In the early years of 1970, the Amhara were estimated at about five million (Hoben, 1973). After two decades in 1994, they counted for about 26% of the entire population of 73 million (CSA, 2004). The Central Statistical Authority, based on the 2007 Population and Housing Census, put the population of the region at 17,214,056, accounting for 23.35% of a total population of 73,918,505 (CSA, 2008). It also reported that the population of the country has grown at a rate of 2.6% per annum from 1994 through 2007, showing a 0.2% reduction compared to the annual growth rate between 1984 and 1994. At regional level, the highest growth rate was recorded for Gambella region, which was 4.1% whereas the lowest was for ANRS which was 1.7%. The second lowest growth in rank was for the capital, Addis Ababa, at 2.1%. These drastic decreases, which are against reasonable expectation, have not been explained in the summary and statistical report of the 2007 Population and Housing Census (CSA, 2008).

Major crops grown in the region vary. In the highlands, dominant are *teff*, wheat and barley. Sheep, goats, cattle, chicken and equines, to some extent, are the animals tended. Recurrent drought, de-vegetation, persistent soil erosion, shortage of agricultural land (arable land and pastureland) and forest land are among the physical environmental problems of the region (ANRS, 2002; Dessalegn, 1996). The region accounts for more than 60% of the annual soil loss in the country. Because of these and a host of other interlocking factors that have to do with society, politics, economy, technology and ecology, many areas in the region are affected by 'chronic' and 'transitory' food insecurity[9] (ANRS, 2002). This might be an irony as the region accounts for nearly 47% of the grains and 32% of the livestock production of the country, respectively (ANRS, 2002).

[9] Several definitions of food security and insecurity have been given over the years. Availability of food-stuffs, access and consumption at global, national, household and individual levels to prevent hunger and achieve a healthy and productive life have been employed as dominant measurable indicators defining these terms. Focus from global to national and finally to the individual level has been an aspect of the evolution of defining food security and insecurity. The ability to get enough food either from own produce or purchase from the market are currently core aspects of food security. Mere availability of food at global or national levels is no more sufficient condition to achieve food security at the household and the individual level. Perceptions and cultural acceptability of food and the level of dignity that food insecure people achieve in getting their required food to prevent hunger and get the necessary nutrients for productive and healthy life are also necessary aspects of the concept. Simon Maxwell and Timothy Frankenberger (1992) compiled 27 definitions for food security and insecurity given from 1975 through 1991. These definitions generally have grown in the way which is recapitulated here. The definition given by the UN in 1975 went as "Availability at all times of adequate world supplies of basic food-stuffs…, to sustain a steady expansion of food consumption…and to offset fluctuations in production and prices (as cited in Maxwell and Frankenberger, 1992, p. 68)". The definition given by FAO in 1983 was "Ensuring that all people at all times have both physical and economic access to the basic food they need (as cited in Maxwell and Frankenberger, 1992, p. 68)." Focusing on active and healthy life, the World Bank's definition of 1986 has it as "Access by all people at all times to enough food for an active, healthy life (as cited in Maxwell and Frankenberger, 1992, p. 68). According to Maxwell (1988), "A country and people are food secure when their food system operates efficiently in such a way as to remove the fear that there will not be enough to eat (cited in Maxwell and Frankenberger 1992: 69). In a similar manner, Gillespie and Mason (1991) gave "The self-perceived ability of household members to provision themselves with adequate food through whatever means "(as cited in Maxwell and Frankenberger 1992, p. 69). It is not straightforward defining this concept since it is culture specific but that individuals have the legitimate access or entitlement to enough food at all times for a healthy, active and productive life seems to be the bottom-line.

The descendents of what are now known as the Amhara, the predominant inhabitants of this region, are believed to have settled in north Ethiopia crossing the Red Sea from the Arabian Peninsula some three millennia ago (McCann, 1995). While the Amhara have accepted both Christianity and Islam, in the Wello area, Christian Amhara used to dwell in the highlands until the 17th century whereas the Afar (Muslim and pastoralists) occupied the eastern and southern parts of Ambassäl and K'allu (Asnake, 1983, p. 95). Beginning this period, the area saw a gradual advent and settlement of the Oromo, who pushed the Christian Amhara to the highland areas known as Saint and Wadäla Dälanta, whereas part of them remained where they were, interspersed with the incoming Oromo (Asnake, 1983, p. 95). The Afar, who remained with the areas they occupied were part of the ethnic interaction that had been taking place in that part of the country. The interaction between the Amhara and the Oromo must have been intensive over the interlude centuries to the extent that by the middle of the 19th century, in the highlands of Wello, it was difficult to distinguish between the two (Asnake, 1983, p. 95). After Isenberg and Krapf, travelers who went through highland Wello by 1842, Asnake said that the Oromo language was no more spoken by the majority of its population who were settled there (1983, pp. 95-6), adding that since the last quarter of the 19th century, none of them did. While till the present those in the lowland district of K'allu and adjacent lowland villages closer to the highland districts as in Wärräbabbo have retained their language and other aspects of their identity, those in the highlands had been fully Amharanized (Asnake, 1983, p. 96). The cultural domination of the settling Oromo perhaps was even more paramount in the area of religion, as many of the highland Amhara had adopted Islam before 1842 (Isenberg and Krapf, as cited in Asnake, 1983, p. 96). Socioeconomic and political interaction had been hampered between the Amhara, the Afar and the Oromo, by the *Waǧǧirat* raiding tradition until the 1890's, when Ras Mikael (the king of Wello) was able to calm the lowland districts and reduced the *Waǧǧirat* conflicts (Asnake,

1983, p. 96). Also living in the Amhara region are the Cushitic people of Agäw and other ethnic groups as a result of internal movement within the country.

Within this region, the research was carried out among mountain-dwelling, mixed crop-livestock agriculturalists in a district called Wärräbabbo, South Wello zone. There were 2,518,450 people in the zone in 2007, of which 2,216,789 (87.98%) were rural (CSA, 2008). At the same time, the population of the district of Wärräbabbo was 99,824, accounting for 3.96% of the population of the zone (CSA, 2008). Of this, 93,099, (93.26%) were rural whereas just 6,725 people were urban (CSA, 2008). The ratio of male to female population in the district was nearly equal. The male population accounted for 50,106 whereas the female was 49,718.

Local oral histories of origin or past geographical movements of the communities of this research are not so informative of their past. Lineage founders not exceeding five to eight generations removed are to be traced in their genealogies. The descendents of each founder are still attached to the specific localities their ancestors were or were believed to have settled. Nevertheless, through time, some of them have spontaneously dispersed to different parts of the district and a few of them to adjacent districts. Still some have given up farming and rural life for good, establishing permanent residency in provincial town centers and the capital, Addis Ababa.[10] Over the last two decades, considerable numbers of the younger generations have been migrating mostly to the Middle East Arab states in search of survival livelihood. Replaced by a young generation on the move, the days are no longer of stationed people.

[10] Rural-urban migration appears to be a topic accorded less attention of (academic) researchers in Ethiopia compared to such topics as land degradation and famine. One of the probable reasons is that this form of migration is insignificant to affect the general landscape of human settlement and resource exploitation in the country. All the same, coupled with rural-to-rural migration, a topic equally neglected, if not more, the net outflow of individuals and households from rural villages is not only an interesting topic for academic investigation but also for practical reasons to facilitate socioeconomic development in rural Ethiopia.

The origins of their lineage founders are told by elders to be within and without what was the province of Wello, divided as North and South Wello during the days of the *dergue*. For instance, the *Irgoyyé* lineage founder is said to have come from the Harar area in east Ethiopia. The clergy lineage in K'és Gända came from the adjacent area (now district) of Ambassäl*,* relocated by Ras Ali, the then provincial ruler during the reign of Emperor Menelik II (1889-1913), into Gäddärro, to build a church (still functioning).[11] Also, the Bäk'alo lineage moved to there from Ambassäl*,* for reasons my informants did not know. According to local history, the Gäddärro area was occupied by Muslims when Bäk'alo, a Christian, was relocated there in the second half of the 19th century. He is remembered for his refusal to convert to Islam upon the request of local Muslim dignitaries, who, then, dubbed him *Bäk'alo,* following his refusal in Amharic: *"bäk'alé ïśänallähu" (I remain faithful to my religion).* Through time, however, all of his descendants have converted to Islam.[12] In what is today village Awraççа, eight households, two of them headed by brothers, were said to have settled there from other parts of Wärräbabbo and the rest of Wello at about the same time. Today, in the Gäddärro area, there are more than two dozens of lineages, some of them descending from these lineage founders. As will be shown in Chapter Five, the oral history of their land tenure also begins with that instituted by Ras Ali or inherited from the past during his rule. Elders say the land tenure system of

[11] There has not been mention of attempts to convert the population of the area to Christianity, whose conversion to Islam has been completed during an earlier century. The origin district is perhaps the most mountainous, rugged and dissected districts in Wello, also exhibiting one of the severest land shortage problems. Therefore, it is likely that the out migration of the ancestors of K'és Gända was prompted by ecological rather than political reasons. The dissertation considers this strategy, a part of 'spontaneous' resettlement, as one of the strategies that were in use to cope up with ensuing land scarcity before this was rendered less effective by shortage of livable lands to move to.

[12] The region has been well known for mutual tolerance between Islam and Christianity with a relative ease of conversion from one to the other. For instance, the collective prayer *wädağa*, traditionally and still practiced by Muslims has also been practiced by Christians in Wello. For detailed discussion on such religious mutual tolerance see Kalklachew Ali (1997). The *wädaja* institution has long been practiced by Christians in Hararghe region (See Mulugeta Gashaw, 2011)

Ras Ali had continued without significant change till the 1975 Land Reform of the *dergue.*

What is currently structured as Wärräbabbo district has undergone a number of administrative and political re-structuring during the past successive regimes (Cohen and Koehn 1980, Markakis, 1974, as cited in Rahmato, 1996, p. 4). Currently, Wärräbabbo is one of the 21 districts, two town- and 19 rural-based, under South Wello zone. It has 20 farmers associations (FAs) that are called peasant associations (PAs) and two urban dwellers associations, namely the district seat Bistima and another town, Bokoksa, closer to the regional boarder with Afar.

In terms of altitude, according to the South Wello Zone Agriculture and Rural Development Department, the zone exhibits a range of 1,000 - 4,247 m.a.s.l. Of the total, 21% of the landscape is flat, 41% mountainous; 37.7% valley and 0.3% water body. According to the same source, climatically, 17% of the area is *k'olla* (tropical), 35% *däga* (temperate), 46% *wäina däga* (sub-tropical) and 2% *wïrç* (alpine). According to Wärräbabbo District Agriculture and Rural Development Office (WDARDO), Wärräbabbo, one of the districts in this zone, is divided into temperate; sub-tropical; and tropical areas, exhibiting 6.18, 47.49 and 46.33 percents of these agro-ecologies, respectively. Its geography is largely mountainous with plenty of rolling hills, ridges, dissected landscapes and valley bottoms, causing great altitudinal variations, ranging from a low point of 1,135 to a high point of 2, 800 m.a.s.l. (The detailed descriptions of the landscape of the ethnographic communities are presented in Chapter Six, Sub-section 6.4).

According to the annual action plan document of Wärräbabbo District Agriculture and Rural Development Office, the total area of the district is 70,500 ha. Its land use in the same production year was: 15,690 ha. of cultivated land; 1,295 ha. of grazing land; 37,022 ha. of forest, bush and scrub

land; 1,359 ha. of land used for construction purposes; 30 ha. of water bodies; and 15,104 ha. of "waste" or "useless" land *("t'ïkïm yämmaysät märét').*[13] It is one of the moisture-stressed and drought-prone districts in the country. Its average annual precipitation is 700 ml. All the *däga, wäïna däga* and *k'olla* agro-ecologies have bi-modal rainfall. The former two agro-ecologies collect two rain-fed harvests whereas the latter, though dependent on both rains, collect just one harvest. The major wet season, called *kïrämït* or *mähär,* generally starts in mid-June and extends till mid-September. The minor wet season, called *bälg* or *bïllagi,* falls from January through March. This small rainy season showers the low lands as well as the highlands but only some highland areas with low evapotranspiration could reap harvests using it. The rest use it only to plant long cycle crops namely, sorghum and maize, and to find more pasture and water for their livestock. The dry season called *bäga* extends from October to January.[14] The district has 452 springs. Its topography has however acted as a barrier to utilize this potential resource for irrigated agriculture. The same source estimated the forest coverage of the district to range from 2 to 8 percents. The official interpretation at local level is a direct reflection of the national which largely incriminates population pressure as a cause of "ecological disequilibrium" except that its estimation seems to be much better than the national in that it gives a range rather than clear-cut percentages. The same annual plan document stated that the soil categories and their percentage shares in Wärräbabbo are: clay `soil (32%); clay loam (54%); brown soil (10%) and red soil (4%).

[13] The English term often used to describe such a land is "barren" or "waste" land. In practice, most of such lands had been intensively used for long periods by humans. Even today they do not appear as "unproductive" and "useless" as both the Amharic and the English terminologies describe such lands to be.

[14] According to the National Meteorological Services Authority (NMSA, 1996), rainfall distribution is the major criteria employed to define "rainfall regimes" and their "concurrent seasons" in Ethiopia (NMSA, 1996). The country has four rainfall regimes and four types of seasons that go with these rains. The four seasons are namely "two seasons type" with wet and dry weather; "three seasons type" with *bäga*, *bälg* and *kïrämït*; "bi-two season type" with doubling dry and wet moments during the year and "unidentified season" dominated by warm and dry air and "occasional gusty winds" receiving "sporadic rains" from July to February (NMSA, 1996, pp. 5-6). The great majority of the ANRS, including the district of Wärräbabbo, is found within the "three seasons type" regime.

According to Wärräbabbo District Agriculture and Rural Development Office (WDARDO, 2008), accounting for 91% of the population, mixed crop-livestock agriculture is the mainstay of the district. Of the remaining, 1% of the population mainly leaves on handicrafts; 5% on small-scale business and 3% on sale of labor. In all agro-ecologies, frequent ecological problems, largely drought and excess and mistimed rains, affect crop and livestock production, contributing for the persistent state of food insecurity. Therefore, most of the residents of the district are unable to produce enough to tide themselves over a full year. Food gaps of three to nine months in a year are common and are hugely covered by international relief food and cash aid. This has become the norm rather than exception for the last four decades. Day labor as well as in-country labor movements and overseas labor migrations are also among the important coping mechanisms employed. (These coping or survival mechanisms are discussed in Chapter Twelve).

Health service delivery is by far better than what had been in the past as what could be said for education. Nonetheless, major health indicators in the district reveal that there needs to be improvement in this regard. According to information obtained from Wärräbabbo District Health Office, the total population of the district in 2009 was 106,189, out of which 50.49 were female. Of the total, children under five were 14,336, of which 50.5% were female. In 2009, there were four government health centers, 20 government heath posts, three private clinics and three pharmacies across the district. Even though the health service coverage of the district was reported to be 100% by this office (My questionnaire, 2009), more of these health services are still needed, rendering service delivery short of full coverage. Two health officers, 22 nurses and two health assistants run these government health facilities, including the health post of Gäddärro FA where I carried out my research.

According to the same questionnaire, a universal EPI[15] coverage was also reported against the four early childhood diseases namely, BCG, DPT, Polio and Measles. Infant and under-5 mortality rates stood at 39 and 123 out of 1000 live births in each case, respectively. The total/crude mortality rate was 229 out of 1000 persons (My questionnaire, 2009). Contraceptive services are provided, ranging from condoms and oral pills to long-term and permanent methods. At the levels of health posts, where services are more of preventive, condoms and pills are provided as family planning and reproductive health measures.

Currently, the national objective of staffing every farmers association with three resident agricultural development agents has been met across the 20 FAs in the district. In each of these FAs, there are three agents, each responsible for crop; livestock; and natural resources management. Organizing and supervising the works of these frontline staffs are six supervisors, themselves also stationed among farmers in rural villages, and serving adjoining FAs. Six veterinarians are believed to better serve the needs of farmers in the district, compared to the past, but demands are still far less than fully met. These staffs are also assisted by four community works coordinators. There is also an Environmental Protection, Land Administration and Use Representative Office in the district. The office was established as a desk under the WDARDO within which it had been functioning until just before the BPR (Business Process Reengineering) which commenced around September 2009. After that, it was established as an independent office representing the regional Environmental Protection, Land Administration and Use Authority.

Out of several rural villages sharing the socioeconomic, cultural and biophysical services and descriptions made so far, I carried out my ethnographic research in three villages in the FA of Gäddärro or code-named 07, in the district of Wärräbabbo. On top of these core villages, namely

[15] Expanded Program of Immunization

Awraççа, Mïsïräta and Absaro, with about 140 households and 650 residents, my study has included to some extent the surrounding villages of Binné, Wärrä Ruga, Wärabäïti, Wäsänä Bäddéssa, Kibi Méda, K'és Gända, Šola Gända, K'ädida, Lénço, Säybäro, Hulluk'o and Bäk'alo.[16]

Table 1: Land Use of Gäddärro FA

Land Use type	Size in hectare	Percentage
Crop and orchard land	798.95	76
Grazing land	52.55	5
Bush land	106.125	10
Residential area	21.025	2
Forest land	52.55	5
Wasteland	21.025	2
Total	1052.23	100

Source: Gäddärro FA Office of Agriculture and Rural Development, 2008

In my quantitative household survey made at the end of my fieldwork in October 2009, nearly 23% of households reported crop production as their primary income source whereas 77% of them reported mixed-crop livestock farming. While none reported livestock rearing as their primary source of income, three households have reported trading to be their basic source of livelihood. These were households running shops and flour mills in addition to cultivation and livestock rearing. Day labor and temporary seasonal migration to the other parts of Wello, the adjacent region of Afar and Humära and Mättämma in the western end of the Amhara region have been practiced, especially by young unemployed/underemployed men and women as (a supplementary) source of income. These coping mechanisms have been employed even during years that are called normal. During the three years preceding my survey, 37.87% of households from the three ethnographic

[16] The process and reasoning involved in research site selection are described in the methods section of Chapter Two.

villages (7.57% FHH[17]) had some members of their households visit these and many other places in the country in search of temporary wage labor.

The emergence of modern features, their expansion and impacts on local life are quite recent. Today, in addition to having the institutions described above, across the rural communities, many FAs are connected to the district seat, Bistima, by dry weather access roads. Though the rough gravel road that passes through this town to the Afar region is ventured only by four-wheel drive vehicles, which are in short supply across the entire year, the situation is said to have been much improved since the early years of the 2000s. Modern amenities started to be introduced into the Gäddärro area towards the end of the imperial regime in the early 1970s. The introduction of household utensils, tailored garments, tin-roofed houses and other elements of foreign culture- though adoption was gradual- had their own impact on traditional village life. With the further expansion and consolidation of the use of money instead of bartering in kind, and exchange through a traditional medium (bars of salt), modern market exchange has been intensified. Today, a closer scrutiny of someone's wear or casual visit to the home of a farmer reveals the presence of imported cultural elements such as wristwatches and radio sets. The far-reaching hands of today's global markets have affected not only the home and the human body. They have also affected the cropland, the livestock, the trees and other aspects of the landscape.[18] The mind has also undergone important changes in some respects such as the acceptance of modern education and such agro-chemicals as pesticides.

In my three ethnographic villages, the household survey has shown that 56.48% of the households have reported as owning radio sets. Even though the energy requirement of households is largely supplied by wood, which has

[17] Female-Headed Households

[18] The provision of emergency relief food that has saved the lives of millions is a beneficial aspect of this interaction whereas impacts such as the deterioration of social determination for work and the replacement of traditional self-sufficiency with a culture of dependency could represent its detrimental consequences.

been a serious burden on the natural environment, 22.9% of them (3.05% FHH) reported using kerosene-powered glass lamps whereas 97.7% (16.79% FHH) reported using the traditional small lanterns unprotected by glass. As part of government rural technology promotion, the introduction and expansion of energy saving stoves has been attempted in different parts of the country over the last decades. Such recent interventions among the research communities have resulted in some households using improved hearths. In this regard, 17.55% of households have got functional improved hearths to prepare stew, make tea and coffee whereas 47.32% of households (4.58 FHH) use improved hearths to make the traditional bread *ïnğära* and related foods.[19]

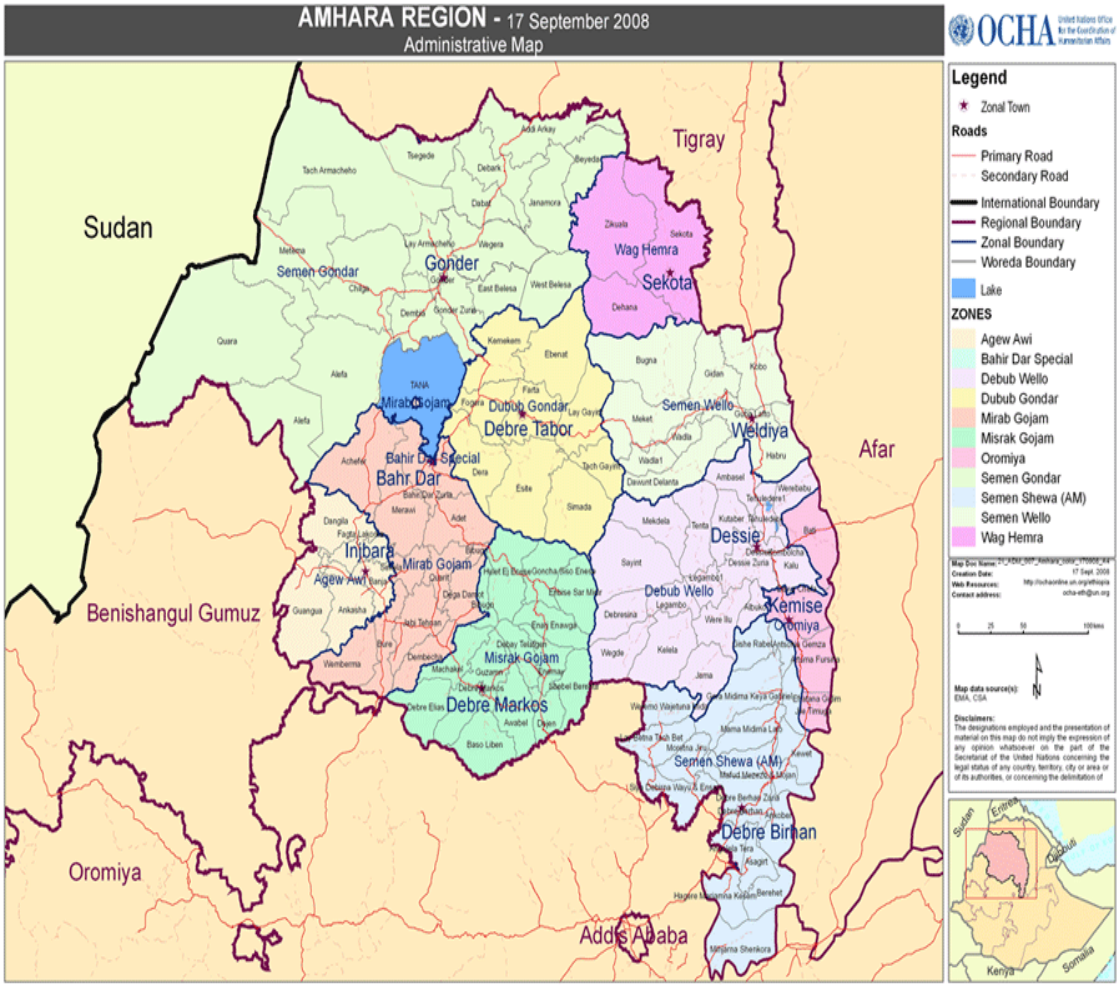
My household survey did ask if households faced shortage of fuel wood to strengthen the qualitative finding that this was so for many villagers. From all the survey households, 56.81% (8.33% FHH) reported that they face this problem. And as the qualitative interviews revealed, this was more so during the wet rather than the dry seasons. Dung cakes baked during the dry seasons are preserved for the difficult wet seasons.[20] Those keeping more livestock have more access to these resources but many do so by forgoing the chance of manuring their lands. The commodification of fuel wood is said to have been drastically increased over the years as are livestock feeds. In 2008/9, 42.42% of the households (4.54% FHH) had bought some fuel wood from their co-villagers and neighbouring villagers to supplement the gap. On average, these households had spent ETB 101 each. This means that sale of fuel wood has become an additional source of livelihood as villagers interact among themselves against the traditional practice of rural villages supplying just the towns. According to the Gäddärro FA Agriculture and Rural Development

[19] These improved hearths are fixed to households with tin-roofed houses or kitchens alone to prevent fire which could start in the case of thatched houses, which the majority of the households own. As I heard from villagers, the same criterion is applied by the rural electrification program that a rural village needs to have a certain minimum number of tin-roofed houses in order to have electricity supplied to its residents.

[20] The saying, "The snake and the toad tide across the wet season together" shows how life is difficult during this season.

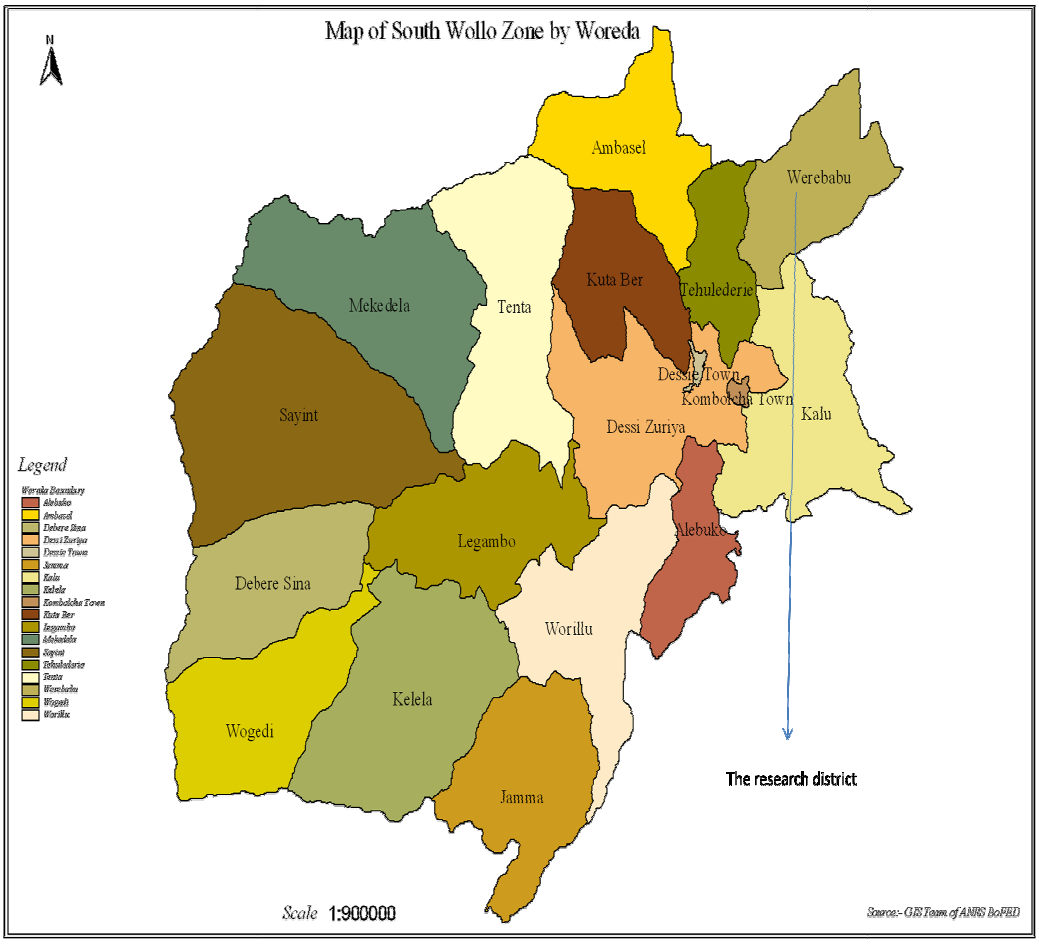
Office, 85% of the energy demands of households in the FA were covered by fire wood, 7% by crop byproducts and 8% by cow dung in the year 2004/5.

Figure 1: Map of Amhara National Regional State by Zone and District



Source: GIST Team of ANRS Bureau of Finance and Economic Development

Figure 2: Map of South Wello Zone by District



Source: GIST Team of ANRS Bureau of Finance and Economic Development

1.2 Review of the Environmental Degradation Explanations in Ethiopia

Agriculture is believed to have been the mainstay of Ethiopians for centuries (Daniel T., 2005; Dula, 1978; McCann, 1995; Pankhurst, 1961). Different explanations have been forwarded about environmental degradation and agricultural crisis in Ethiopia. All of these could fall within the brace of the ecological approaches of anthropology. This crisis has generally been part of the crisis of the African agrarian systems of the 20th century (Okoth-Ogendo, 1993; Sisay, 1987). As a result, the theories and models given for the Ethiopian crisis, share similarities with that of the sub-Saharan Africa. There are explanations of political-ecological, historical ecological, bio-physical environmental and demographic characters. Officially, drought and demography stand out. Explanations based on sociocultural and micro-ecological variations have largely been put to the margin.

1.2.1 Political Economic/Political Ecological Explanations

Over the years, government laws, policies, programs and power transfers affected the ways in which Ethiopian farmers operated their land and land-based resources (Abdul Mejid, 1976; Bryant and Bailey, 1997; Crummey, 1981, 2000; Daniel G., 1990; Daniel T., 2005; Dessalegn, 1996, 1993; Gamaledinn, 1987; Koehn, 1977; Mesfin, 1986; Sisay, 1987). Among these legal, policy and programmatic instruments are land tenure and resource use systems, resource allocation and rural development strategies. Added to these are capacity building, innovation and technology transfer to smallholders as well as the provision of social services such as modern education, health, communication, marketing and credit facilities which have not been adequately developed as yet. What is more, political instability, especially during violent power transitions, and protracted civil wars had negatively affected the environmental resources of the country (Dessalegn, 1996).

Land tenure systems of at least the last century have affected the different class structures of the population differently (Daniel T., 2005; Dessalegn, 1996; Lapiso, 1978; Dunning, 1970; Lulseged, 1975; Taye, 1990). Access to land has also determined the appropriation of agricultural surplus value and subsistence level value. In the extreme cases of inequality, the downtrodden had no access to land at all and lived on their sweat as servants to those who owned the major means of production, land. However, the tenure systems were diverse creating hierarchies of peasants rather than a single peasant class unlike what had been in the majority of the literature.

Towards the end of his reign, the government of Emperor Haile Sellassie I (1930-1974) favored large scale commercial farming geared towards the production and export of cash crops. Thus, government plans, incentives (tax exemptions on tractors, fuel, pesticides, fertilizers, credit provisions) and the expansion of communication were directed to attract foreign investors and a few Ethiopian elites, whereas small farmers were lingering with rudimentary technology and lack of finance (Cohen and Weintraub, 1977, Bondestam, 1975, as cited in Koehn, 1977, p. 2). Following the colonial path, the government believed that large scale commercial farms were the only route for rapid progress in the country. The Third Five Year Plan (1968/69-1972/73) was based on this premise (Dunning, 1970, p. 285, as cited in Koehn 1977, p. 2). The exploitative nature of the system had also been documented by other writers, including those who saw tenure arrangement as an inhibition to adoption of new technology as well as inequalities in distribution of national resources between the two sectors (Dula, 1978; Ellis, 1978; Shiferaw, 1992).

Misinformed and exploitative land and natural resource policies of the past have been carried over to the present (Alemneh, 1990; Daniel T. 2005; Dessalegn, 1991; Mesfin, 1986). State farms during the *dergue* regime (1974-1991) constituted just about 2% of the grain production of the country in spite of the huge amount of resources spent on them (Brüne, 1990; Jansson, Harris

and Penrose, 1987; Polyakov, 1990). This had been quite a disadvantage to the poorly funded smallholder agriculture which constituted about 94% of the cultivated land, and more than 90% of the produce (Jansson et al., 1987, p. 119). Of course, "costs of production are so high that these farms [the cooperatives] incur heavy loses despite the substantially higher prices (between 20 per cent and 50 per cent higher than those received by peasants) paid for their grains by the AMC [Agricultural Marketing Corporation]" (Jansson et al. 1987, p. 119). Brüne (1990), among others, has also documented the same positive discrimination in favor of procedures cooperatives against small farmers who worked on their own.

Many scholars (e.g. Dessalegn, 1996; Koehn, 1977; Mesfin, 1986) largely hold government administration responsible for the 1974-5 and 1984-5 famines which killed more than 200,000 and 1,000,000 people, respectively. The decision of the *dergue* that led to the relocation of more than a million people from degraded and drought-affected parts of the country onto "virgin" or better-resourced parts in western and southwestern Ethiopia and its negative human and environmental effects had also attracted the attention of many scholars (e.g. Pankhurst, 1990, 1992; Wolde-Selassie, 2004). Largely, the west criticized the program as a violation of human rights, misappropriation of land belonging to marginalized ethnic groups and the destruction of remnants of forests and vegetation. The ecological efficacy of the environmental knowledge of the settling people was also challenged in this process (e.g. Wolde-Selassie, 2004). The 'villagization' of scattered rural households (1984-6) had also affected the land management strategy of farmers though for a brief moment.

In the same manner, lack of resources on the part not only of Ethiopia but also of the rest of Africa- at individual households, communities and country levels- has also been mentioned as a major factor of environmental degradation and related socioeconomic problems (Befekadu and Tesfaye,

1990; Eshetu, 1990). Scholars criticized governments' arms race due also to the influence of foreign interest. Civil and inter-nations wars consumed tremendous amount of resources to support the army and purchase armaments. For instance, Norman Myers said that in 1981 Ethiopia spent $ 447 million on national defense whereas Somalia did $105 million (Myers 1989, p. 221). Quoting others (Luckham and Bekele, 1984) he added that coupled with what had been expended in the previous years, a five year expenditure of the Horn on the Ogaden clash was to be estimated at over one billion dollars. He remarked, "If only a small part of that sum had been allocated ahead of time to reforestation, soil safeguards and associated aspects of restoring the agricultural base in the two countries (estimated by the United Nations Anti-Desertification Plan to cost no more than $ 50 million a year), the disastrous outcome [the 1984-5 Ethiopian famine] could well have been avoided" (Myers 1989, p. 221). The war that engaged the *dergue* with the TPLF (Tigrian People's Liberation Front) and ELF (Eritrean Liberation Front) was said to have been costing the Ethiopian government millions of dollars a day. In this regard, the overall resource inadequacy of African countries to deal with huge disasters is not to be forgotten (Christensen and Witucki, 1986) even without such expenditures on wars.

In summary, political ecological and political economic explanations of ecological crisis argue that political decisions affect the ways societies perceive and make use of their economies and natural resources. Their responses to their problems are also affected in the same manner. Anderson and Johnson (1988), who support this position, had given their observation in relation to Ethiopia. They wrote,

> Husbandry practices and survival strategies have, at times, been influenced by a history of belonging to a state or, more generally, sharing an ethnic identity. Indeed as Ethiopia's experiences in the 1970s and 1980s serve to indicate, the impact of environmental adversity can be intensified and deepened by the political decisions and actions of the state. (Anderson and Johnson, 1988, p. 18)

Political factors such as 'inappropriate agricultural and market policies'; socioeconomic factors such as 'inadequately developed infrastructure' like schools and hospitals as well as natural environmental factors act in combination to cause both transitory and chronic food insecurity in Ethiopia (Ayalneh, 2002, p. 70). Mesfin's (1986) observation that "famine is neither the work of God nor that of nature, but of man and his institutions" and his argument that "Governments, government officials, traditional patrons, landlords, rich farmers, and merchants created the disorganized, illiterate, weak and voiceless mass of peasants" could represent the political ecological and political economic perspectives in Ethiopia.

1.2.2 Demographic and Resource Overuse Explanations

In his treatment of agricultural and food crises of the 1970s and 1980s in Ethiopia, north east Africa and throughout Sub-Saharan Africa, Sisay remarked: "In recent years the debate about population growth has been unnecessarily emotional. The extremes range from the "hawks," who argue that population explains the current crisis, to those who claim that rapid population growth is advantageous" (1987, pp. 15-16). In broader terms, government, donor and NGO positions could fairly represent the 'hawks' in this classification, in the case of Ethiopia. This same writer goes on to say,

> The more rational approach views population as one important constraint to achieving food security and examines population growth in relation to the underlying poverty of the region. Significant reduction in that growth can be made through improved income distribution and education and training, specifically among females. (Sisay, 1987, p. 16)

Sisay, nevertheless, is well aware that if the region continues to lead the world population growth, this shall compromise growth in agricultural production leading the region to further problems (1987, p. 16).

Markos warned that if the population growth continued unabated in Ethiopia, given its uneven spatial distribution, the growth "is expected to have a serious impact on agricultural productivity and the supply of energy" (1990, p. 160).

He noted, based on official estimates, the total land classified as agricultural land (cultivated, forest and grazing land) of the country was 79 million ha, constituting 64% of the total 122 million ha landmass of the country (Markos 1990, p. 160). According to the same writer, out of this agricultural land, just 9.3 million ha was cultivated whereas 3.1 million ha served as fallow and the rest was used as grazing land (1990, p. 160). In 1987, out of an estimated 80 million ha of land just 12 million were believed to have been agriculturally used (Jansson et al, 1987). In fact, according to some official sources, the cultivated land has now grown to 15 million ha amidst continued population increase and land shortage discourse.

The growth rate for the country's population at large had been quite small not only in relation to other African countries for which comparable data were available but also in comparison with the demographically recommended 2.1% replacement growth rate (Bequele and Eshetu, 1960; LeBel, 1978). From 1950 through 1960, and again from 1960 through 1965, the annual national population growth rates for Ethiopia were 1.6 and 1.8 percents, respectively, both falling below the replacement threshold (LeBel, 1978, p. 762). The annual rate of growth of real domestic product for these periods increased from 2.3 to 3.1%. However, according to this same author who quoted a 1976 world survey of IBRD (International Bank for Reconstruction and Development), when the annual rate of population growth for 1965-1970 was increased to 2.4%, that of the real gross domestic product was decreased to 1.9% (IBRD, 1976, as cited in LeBel, 1978, p. 762). This shows that there is no direct correlation between the two. As Myers noted, with this growth rate which was lower even by western standard, the population of the country grew from 18 million in 1950 to 48 million in 1987 (Myers 1989, p. 220).[21] Eshetu and Assefa made the same observation, arguing that mere population growth could not be regarded as a basic reason (1969). Myers further wrote,

[21] This demographic transition factor would affect the country for decades even when growth rate is to be decreased, rendering the issue quite difficult.

"While we can scarcely assert that population growth has been a prime or direct cause of the recent [1980s] turmoil in Ethiopia, it has certainly helped to worsen the situation" (1989, p. 220). Writing about Ethiopia, Siegfried Pausewang remarked,

> In practice, population pressure was not the only factor interfering with a concept of fair distribution according to everybody's needs and abilities. Influence in the community, prestige and power biased distribution. Growing extraction of resources was bound to increase pressure on land and competition for its allocation. (Pausewang 1990, p.40)

According to the 2007 Population and Housing Census, the population of the country was 73,918,505 (CSA, 2008). Currently, some estimates put it between 77 to 84 million.

1.2.3 Environmental Deterministic Explanations

Governments in Ethiopia regard drought as the fundamental cause of famine and food insecurity because this is the simplest and most advantageous way for them (Mesfin, 1986). In this perspective, famine, acute and chronic food insecurity and poverty in rural Ethiopia are believed to have been primarily caused by successive droughts, intermittent rains and inadequate precipitation. This explanation has somehow biased the donor communities, NGOs, the people, the media and even some scholars (Dessalegn, 1996; Mesfin, 1986; Sisay, 1987). Based on this meta-narrative, past and current governments have been launching their annual relief appeals to the international donor community. Over the last four decades, from four to nearly 13 million Ethiopians had been receiving emergency food assistance every year, believed to be primarily resulting from 'drought-induced' crop and livestock failure. For instance, in 2009, the Federal Disaster Prevention and Preparedness Commission (DPPC) issued an international appeal seeking support for more than 6 million Ethiopians threatened by lack of food. This has become a cyclic official ritual following the natural drought cycle, which over the years, has been reduced from every ten to every five years and now to every year.

Taking part in this protracted process are governments, NGOs, donors, local politicians and vulnerable farmers themselves.

Mesfin has criticized NGOs for simply reiterating governments' famine explanation and for focusing just on the symptoms of the problem rather than the root causes (Mesfin, 1986, p. 6). He wrote, "they [NGOs] are not very different from the Ethiopian peasants: they only replace the peasants' God by natural forces. In either case man is helpless" (1986, p. 6). This reveals how Ethiopian farmers live not only in insecure biophysical but also in politicized environments, engaging not only national governments but also western states and their institutions. These actors construct the situation in ways that befit them but also doing something beneficial to the population at risk. Such writers as Asmerom, while acknowledging that there are different causes of famine, for Ethiopia, they stress that drought is the major one (1994, p. 249). On the other hand, others doubted whether drought induced famine existed at all in 1974-75 and 1984-85 famished periods. According to Myers, "The mid-1980s drought has been no more than a triggering factor, precipitating a crisis that has been building up through the pressure of population growth and agricultural mismanagement" (1989, p. 220). The effect of topography and altitude on environmental degradation in Ethiopia, however, remains a very important bio-physical factor (Behrens, 1971) though less represented in the discourse.

1.3 Scope of the Study and the Problem

Agriculture has been playing a central role in the technological, social, economic, political, cultural and ecological lives of Ethiopian highlanders over the last three millennia (Hoben, 1973; McCann, 1988). Even though the country has had its own alphabet and a writing culture dating before the birth of Christ, its scholastic tradition was largely limited to ecumenical services to the disregard of other aspects of life (McCann, 1988). Here, one can add the lives of emperors and kings. As such, irrespective of the centrality of

agriculture in every field of life, including human-environment interaction, McCann wrote, "agriculture as a technical and social process is virtually absent as a major field of inquiry in Ethiopian historiography" (1988, p. 149). As shall be revealed in this writing, the cultural aspect has also been subjected to a state of disregard more than the technical and the social. Here, it is worth quoting McCann once more at some length,

> The historical reality of state-agriculture relations is ironic. The expansion of state power over time depended heavily on the expansion of the highland agricultural system, yet the management, technology, and property system at the foundation of that system lay almost entirely outside of state control. Moreover, the state as a focus for research has dominated historical and political science scholarship with almost no attention paid to the need to understand the process of management at the micro-level in relation to environment, demography, and social institutions. (1988, p. 152)

In this regard, Allan Hoben (1973) partially stands out as pioneering exceptions. Based on extended ethnographic fieldwork among selected farming communities in the then Province of Gojjam, he had described the social impacts of population pressure and institutional change on the *rïst* and *gult* land tenure systems. (Discussion of these tenure forms is made in Chapter Five). He had thus shown how power, land and social status are related to rights to land even though these parameters are not necessarily causatively related. The institutional change that started to bureaucratize power and politics in the state governance of the country had been presented as additional factor making land, power, status and descent distinct in the economic and political life of the society (Hoben, 1973). Questioning a number of prior assumptions that widely existed about the relation of the Amhara people to the land; he had also come up with new knowledge and concepts such as *rist right* and *rist land*[22] (Hoben, 1973). In Wello, Teferi Ababte has shown how farmers have been dynamically engaged in coping with ecological problems and government political and agricultural extension services based on the facts of their socioeconomic and agro-ecological conditions (2000). He has also shown household labour as an important factor of production in post-land

[22] See Chapter Five for definition of these terms.

reform Ethiopia, unlike in the past where ownership of land mattered more (1993).

Yared Amare (1999) had studied Amhara communities in Wogda, in north Shoa zone and documented how households interacted with the land through crops and livestock for economic and food security sustenance. In so doing, he had also considered the impact of the local ecology, livestock production and cultural perception of self-sufficiency and food, affecting the patterning of crop production. Even though the area he studied is not among those places much affected by food insecurity or prolonged food shortage, he has shown the complexities of coping strategies among individual households interacting with the land and among themselves. Unlike observations made in many other places in the country, his research for this specific district has demonstrated that oxen is less a differentiating factor of production because this asset is generally uniformly owned by households. His study, in this regard, has shown how land holding is an important factor of agricultural production.

Such detailed studies are quite useful both from academic and policy perspectives. Their relevance would be buttressed if more localized studies are done not only to gain additional descriptive knowledge but also to allow more valid comparisons and theoretical generalizations. Adding more factors such as international relief aid, the role of religion and the natural environment is one way of getting closer to such an end. Kiflemariam has stressed the need to do further extensive and large-scale studies on the 'ecological features of traditional agroecosystems' rather than getting simply satisfied by expertise discussions not well based on empirical, field-based investigations (1997). This need has to be extended to also deal with the non-ecological aspect of traditional agriculture.

What is more, as the literature review in the earlier section has demonstrated, explanations of drought, land degradation, land scarcity as well as food shortage/famine have been predominantly made in isolation from

sociocultural and micro-ecological contexts of rural populations. Demographic explanations that focus on population pressure as the principal cause of environmental degradation, land shortage and production reduction, are useful but their extreme version (a neo-Malthusian position) is undoubtedly flawed. Quite often 'bad nature', mostly drought, has been employed to explain famine and food insecurity. This position, held largely by governments, donors and NGOs, suffers from excessively charging nature and shying away from the root causes of the problem. Theories playing up inequitable resource distribution, lack of tenure security, inappropriate economic policies, deficient market and pricing policies or lack of good governance in general, do supplement the deficiency of the 'bad nature' theory. Nonetheless, they are largely based on expertise knowledge than field-based evidence. Those focusing on international economic and political inequalities are advantageous in some respects but tend to camouflage the problems of power sharing at community level. All of these theories, notwithstanding their strengths, lack in four important respects. In the first place, the role of culture in human-environment relation has been accorded just a marginal interest. Secondly, micro-ecological differences and their impacts in adapting to natural vagaries are neglected as a result of the focus on regional and country-wide analyses. Thirdly, and in relation to these factors, what has been called the 'Africa in crises" model, has promoted the focus on large crises to the neglect of smaller and continuous stresses. Quite often, in practice, these stresses precede and exacerbate the effects of large crises that take the attention of politicians, scholars and the international community alike. Fourthly, these theories are largely synchronic or less focused on the past. Thus, environmental problems have been mainly treated as outcomes rather than processes.

The theory which has adopted a linear perspective in its explanation of population pressure has caused the same thinking that the environment has

come declining in the same manner without improvement. Contrary to this, some geographically limited recent studies have shown how the forest coverage of some areas has improved compared to the past, amidst the problem of population pressure or overpopulation (e.g. Muluneh, 2003). Except for new information aired by government media and some other organizations that the forest coverage has improved up to 9% (government) or even 13% (FAO), the 'ascending degradation theory' has continued unchecked for decades. If these newer estimates made as of 2009 are reliable, what had happened earlier depicts how environmental knowledge is gradual to keep brace with changes in the bio-physical environment. Many years, as can be learnt in this dissertation, should have been spent to bring such a big leap in the vegetation cover of the country.

Also, beyond mere numbers, the neo-Malthusian demographic argument should include level of consumption, which is part of culture, but which it does not. The environmental problem in the country is historical and at the same time evolutionary but the population, according to estimates already quoted, started to increase beyond the replacement level of 2.1% just after the 1960s. Population size, structure and spatial distribution affecting the environment are also results of cultural orientation, social relationships and micro-ecological realities. The role of social relations and culture in the analysis of this intricate and dynamic population - environment nexus in the current natural and institutional environmental set up is one to be studied yet. Farmers' feelings, attitudes and knowledge in this regard will undoubtedly enrich such an ecological analysis. It should also be noted that while the neo-Malthusian theory still bears relevance for the analysis of the population-resource nexus, it suffers from another assumption which does not appear to be surfacing so far in its critique. It has been a spatially restricted concept and lacks insight into the complex action and interaction that has been taking place among the people of the world who had been for long segregated by

ostensible and nominal national boundaries as well as formidable distances and physical barriers.

The study of land degradation in relation to the social organization and life of a people at local level is best achieved in relation to higher level spatial and socio-economic and political organization. All the same, local ecological variations have been largely subsumed under macro-ecological narrations (regional and national). Therefore, the discussions have been based largely on the views of state policymakers, experts, development planners, academics and donors (Mesfin, 1986). In practice, the millions of farmers constituting about 85% of the country's population have had their own internal mechanisms of dealing with resource management, including their risks (e.g. Teferi, 1997, 2000). What is more, the neglect of local bio-physical, social and cultural differences has resulted in the non-documentation and non-analysis of important TEK even though some anthropologists have considered TEK and resource management in the context of resettlement and related studies (e.g. Berihun, 2004; Wolde-Selassie, 2004). As a result, several development programs have been in jeopardy or less effective as technologies and scientific recommendations run against local circumstances. This form of knowledge, - based on generations' empirical, mystic and psychic experiences- though in part contrary to the scientific approach to knowledge (Dessalegn, 1991) - yet has had crucial impacts on local environmental relations and resource management practices (e.g. Berihun, 2004; Wolde-Sellassie, 2004). Still there is a knowledge gap in this regard that needs to be further addressed. This problem has also been emphasized for the rest of Africa. Basset and Crummey said, "It [the dominant narrative] gives little attention to the social dimensions of land use, or to the local cultural-ecological and larger political circumstances which frame natural resource management" (2000, pp. 25-6). Christer Krokfors wrote "Land degradation in relation to the socio-economic structure of the population is best studied in a local setting. But this setting has to be related to higher levels of geographical

and socio-economic organization." (1989, p.202) All the same, as we have seen the explanations on human-environment relations in Ethiopia, in the forgoing section, local ecological variations have been subsumed in macro-ecological narrations. Therefore, the discussions have been largely based on the views of state policymakers, experts, development planners, academics and donors (Mesfin 1986). Accordingly, the importance of specific ecologies and societies "as sinks of tradable carbon, stores of biodiversity wealth, and symbols of cultural alterity" (Fairhead and Leach 2003, p. 4) has been compromised to risk of neglect and disappearance. This affects current and future humanity's disaster coping capabilities.

Writing of rural vulnerability to drought in north Ethiopia, McCann has said that the interaction between particular ecologies and historical issues, property relations to such resources as ox, seed and labour as well as social reproduction have been neglected by scholars and policymakers (McCann 1988, p. 302). Despite some improvement, the limitation observed by McCann continues to the present. There is more to this scholastic limitation: "flawed perceptions about the economic and historical relationship between the state, the environment and agriculture have contributed to a poor understanding of the process of adaptation to stress at the local level in areas of Ethiopia most vulnerable to ecological crisis" (McCann 1988, p. 303). The Ethiopian case, apart from being macro-oriented and less historical, largely favors single theorization (the radical demographic and environmental deterministic versions). David Campbell and Assefa Mehretu, among others, have succinctly described this theoretical limitation which has nonetheless been the basis for government and international interventions over the decades. Against this, a framework to analyze the issue in a broader perspective is suggested, involving a number of factors. In their model of food shortage, physical constraints are considered just as one of the four 'principal dimensions', the rest being "the political, socioeconomic, and spatial bases of agricultural systems" (Campbell and Assefa, 1986, p. 1).

Justifying their model, they had to say:

> Current constraints on food supply have their roots in a number of political, social, spatial, and physical factors. Conventional approaches to the study of food shortage in Africa in general and the Horn in particular have put too much emphasis on the physical constraints of the land and climate. This is at the heart of the problem of development administration and planning for food security in Africa. Without underestimating the seriousness of the environmental constraints to food production, we argue … that posing the problem of famine and undernutrition in this conventional deterministic manner is misleading for two reasons. First, resolution of the problem is likely to be sought in a technological approach, which none of the African countries affected by the disaster have the means or the expertise to apply. Second, posing the issue in the physical deterministic mode ignores the other principal constraints on the development of food production. In regions such as the Horn, forces that are of equal or greater importance are political, social, and economic factors. We shall, therefore, present a model for the study of food shortage in which we portray the physical constraints as but one of four principal dimensions of production, the other three being the political, socioeconomic, and spatial bases of agricultural systems. (Campbell and Assefa, 1986, p. 1)

These writers do not specify if what they called "socioeconomic" also included the cultural. The attention on social factors might invite the treatment of many cultural issues as well, but culture should have a manifest space in itself if the model has to be comprehensive. The analysis of cultural notions is essential to know why farmers are resistant to change and to design better strategies to develop them (Bonvin, 1986).

In their resource use behavior, Ethiopian farmers have been employing both protective and un-protective cultural elements embodied in their environmental ethics, values, norms, and philosophies (Berihun, 2004; Tesfaye, 2003; Wolde-Sellassie, 2004). Therefore, in countries like Ethiopia, where most of the people are rural and tradition counts significantly, frameworks not accommodating culture in full are unlikely to guarantee adequate comprehension. For instance, the religious aspect employed in the analysis of famine as reflected in this research, is scarcely considered in its complexities. In the same manner, crops, livestock, farmlands and trees are part of the spiritual life of the people as are their material aspiration. Kay Milton has noted this when she wrote: "Studies of people's religious beliefs

and practices implicitly, if not explicitly, address their understanding of natural processes and their responses to environmental hazards" (1993, p. 4). The importance of this religious aspect has been stressed by other scholars as well (Sullivan, 2001; Tucker and Grim, 2001). Writing further, Milton (1993, p. 3) rightly remarked, "The Australian Aborigine who avoids hunting animals on sacred sites, and performs ceremonies to ensure the continued existence of edible species, is, like the Greenpeace campaigner, implementing environmental responsibilities". These crucial local factors are largely lacking in the government, political and many scholarly discourses of Ethiopian environmentalism.

Local environmental perspectives of smallholders could be seen in light of three historical periods in recent history of the country. The period up to the 1940 had been more of isolation from the west and the rest of the world and hence their influences. That from 1940 to 1974 started to expose most of the Ethiopian smallholders to western agricultural inputs, technologies, innovations and the bureaucratization of land and political administration (Hoben, 1973). After liberation in 1941, the efforts of the imperial government at improving agricultural production set unprecedented steps in the history of the country at the time.

From the mid-1960s to date, agricultural extension such as (Comprehensive Package Program and Minimum Package Program), education and health services and rural road and telecommunication infrastructures started to stimulate the rural-rural and rural-urban linkages more than ever before. In the context of these approaches, high-yielding and short-maturing crop varieties, stock breeds, credit as well as some farm implements have also been imported and disseminated among the rural population with the same aim of improving traditional agriculture and stock breeding in the country (Habtemariam, 1994). Along with this creeping change, Ethiopian farmers had to go through

different national politics, varied ideologies (perhaps better termed *ideological religiosities*) as well as policy and programmatic shifts. It is important to note that in this process they have never been insulated from the economically and culturally globalizing waves largely radiating from the west. They have had to adapt, modify, symbolize, succumb to or manipulate and resist these external influences and opportunities. In the face of this change, we do not have adequate knowledge about the impacts of these influences on the cultural understandings and response strategies of small farmers to environmental problems such as drought and shortage of land.

Overall, based on regional and macro-level explanations already considered, there has been emphasis in favor of augmenting the size of cultivated land, relocating people, obtaining more rainwater or extracting more water supplies in addition to use of modern inputs and technologies. While these official strategies are necessary, usually they are carried out without adequate grasp of local sociocultural knowledge, views and values as well as micro-ecological variations. The massive population relocation of the *dergue* (e.g. Alula, 1989; Wolde-Sellassie, 2004) and the recent country-wide rainwater harvesting programs are good examples. This has been so because resource problems were and still are largely treated as bio-physical and technical, and hence their solutions. What is more, there is a haste to be freed from poverty and degraded environment within a short period of time. Such moves have also been politically inspired. Therefore, the rush to solve problems of seemingly immediate, yet of long-standing, processual and philosophical character, affected the wisdom and potential to skillfully use the environment. As a result, rich and complex TEK[23] remained without being effectively

[23] The use of the terms traditional or indigenous environmental knowledge is quite recent in Ethiopia, most likely not dating before a couple of decades. Even today not much discussion of the topic and mention of the concept is made in academia, NGO and government. The late introduction of anthropological training into the country (early 1990) and the political focus of prior anthropological studies as well as the much reliance on western science and technology (though less effective) could be cited as part of the reasons why this form of knowledge has been still neglected.

documented and used. All these hinder the wisdom and potential to influence or make use of the environment through sustainable agriculture, not denying the limiting factor of the natural environment. Certainly, there is an insidious danger in this mode of approaching the problem. It obscures the possibility of looking inwardly and the ability of taking lessons from the past to prevent future environmental degradation, low and declining agricultural productivity and disturbance of human welfare. Similarly, the treatment of land resource problems (land degradation, land shortage and drought) as not only practical constraints of the bio-physical environment but also of state and smallholders' principles and complex strategies of managing these resources needs the treatment of sociocultural, economic and political factors in localized and historical perspectives.

Writing on human and economic problems in Africa as relate to natural resources, Lief Manger, has summarized the old and the fledgling newer perspective in the following statements:

> Many of these ['planners and decision-makers dealing with the African crises] seem to be more concerned with the immediate problems at hand rather than understanding underlying causes. There is thus a tendency to assume that an immediate human cause of any particular symptom of ecological degradation is the significant cause. This has led to strategies that focus more on the natural symptoms of environmental problems, trying to rearrange social and economic factors in relation to them. But if we are to follow the perspective…which calls for more complex explanations, we have to make room for the independent working of social, economic and political factors, and only when the dynamics in these fields are established can we see what implications this has for the environment. Through such a procedure we can see how social, political and economic relations function as adaptive mechanisms that are as important as technology. And, as one group never operates in isolation, but in context of other groups, we have to focus our studies on larger regions in which we can see the interplay among different groups, an interplay in which political and economic strength might be more important than the technological levels of the groups. (1988, p. 155)

As already said in this section, that the old crises explanation of Africa (including Ethiopia) is problematic is also expressed by its focus on immediate crisis management than on gradual ecological changes. Anderson

and Johnson has further stated that the "social context and historical perspective" of environmental crisis in Africa has been ignored by much of the 'Africa in crisis' school of literature (1988, p. 4).

In brief, the lack of space for sociocultural analysis in favor of others, specifically demographic and natural explanations; the lack of consideration of micro-ecological variations in favor of regional and macro-ecological generalizations; the emphasis on major crises rather than small, continuous stresses; the emphasis on single-cause rather than integrated theories; the precedence to WSK to the disregard of TEK; the emphasis on the planned and the conscious to the disregard of the unconscious and the religious; and the inadequacy of anthropological and historical lens to the whole issue of agrarian resource use or misuse are the scholastic and policy circumstances justifying this research project.

1.4 Research Objective

In view of the empirical and theoretical understandings of agriculture and human-environment interaction considered so far, my research sets out to meet three major objectives. It aims to investigate as to how local and extra-local factors interplay and influence the perceptual and cultural understandings and responses of small farmers to their environmental constraints and opportunities. Local insights and practices which are not as yet adequately represented in the dominant official and academic discourses of climate change and land degradation in Ethiopia are thus captured. By means of this, the ranges of TEK and know-how and their impressive local subtleties and variations are captured and analyzed. Fathoming some of the influences of the external on the local has been also followed as an important objective of this research. The objectives and research questions are:

To describe and explore farmers' perceptions, understandings and experiences of environmental agricultural resources and problems, affecting agriculture.

- How do farmers perceive and understand rain and drought in their environment?
- How do farmers perceive and understand agricultural land, its abundance and scarcity in their environment?
- How do farmers perceive and understand their soil environment, soil erosion/fertility depletion and soil fertility in their environment?
- How do farmers perceive and understand their trees and tree felling?
- What do crops and animals mean in culture for farmers?
- How do they interact with the environment through crops and livestock?
- Why do they grow the crops they grow and the livestock they raise?
- How are individual and group perceptual and knowledge differences to be accounted within the general shared cultural understandings of the environment? And,
- How do farmers understand the human and non-human dimensions of climate change and land degradation?

To explore, explain and interpret farmers' responses to the human and non-human environmental consequences of local climate change and land degradation problems.

- How do they employ their TEK as a response to climate change and land degradation? How is their TEK applied in relation to modern science and technology they are presented with?
- How are they responding to these problems socially?
- How are they coping in relation to their livelihood strategies?
- How do they respond to these problems ritually, spiritually and psychosocially?
- How do they respond at the level of the micro-politics of individuals?
- How are response differences among individual households to be explained or understood? And,

To identify, examine and analyze local and extra-local factors influencing farmers' perceptions, understandings and experiences of (responses to) climatic and environmental resources and their problems with the view to linking the local with the national and then some aspects of the global.

- How and to what extent are farmers affected by the forces of the immediate bio-physical environment?
- How and to what extent do government policies, strategies and programs affect their environmental perceptions, understanding and experiences (or responses)? And,
- How and to what extent could the influence of the international community be inferred in farmers' perceptions, understandings and experiences of their immediate environment?

1.5 Importance, Originality and Anticipated Contribution to Anthropology, Academic Knowledge and Policy

My research contributes to anthropology, academic knowledge and policy on human-environment relations in a number of ways. In the first place, it was conducted among communities that had not been studied ethnographically before, promising new ethnoecological insights, concepts and local theories of resource management, mismanagement and coping strategies. Secondly, studying human-environment relations in an interdependent, processual and interpretative framework that combines ethnography, not only with local history, but also with linkages to some aspects of higher scale social and political systems, renders it a fresh anthropological perspective, especially in the Ethiopian context. From that, we would gain new knowledge as to how local people's lives are affected by local, national and global economic, political and humanitarian conditions and processes. In this regard, the research also shades some light on the challenges and opportunities of ethnography in this postmodern era.

My dissertation considers the population issue at local level in the face of changing national and international contexts. In Ethiopia, amidst population increase and land shortage discourses, availability of unskilled labor and ample land are still considered by the current rural development policy as key resources of the country. The dissertation also treats 'population pressure' as a socially constructed and ideologically laden concept which is subject to difference in perceptual understanding of an empirical (physical or material) problem. In relation to this, the dissertation further argues that past understanding which was based on the assumption that the future of the unborn citizens of the country existed *a priori* to their birth has lost some efficiency in the current context. Therefore, based on empirical findings, it calls for a new mindset to revise the population 'pressure' theory/model to fit the current empirical situations of local, regional and global order.

The proposition that traditional or indigenous societies are better managers of resources compared to western or westernized societies has been debated for quite some time. My observational data obtained from a traditional African setting could contribute to a better understanding in this regard. My research also suggests that there is diversity within TEK as within WSK. Such an understanding would invite comparison and contrast and the search for synergy not only between these two modes of knowledge but also within TEK itself. The research is quite open in terms of upholding the positive qualities of TEK as do most of the anthropological writings. All the same, it encourages that attitudes, thoughts and practices within the traditional paradigm need to be critically evaluated.

My research deals with environmental resources and constraints in Ethiopia yet drawing on approaches and theoretical perspectives also developed in other parts of the world outside of Africa. Therefore, more than being useful to Ethiopia and Africa, it will contribute to the broader field of ecological anthropological theories in some respects. Among others, it suggests that

conscious and planned human interventions are necessary but not sufficient in the environmental quest of our era, unless we also rely on our unconscious aspects and constantly put doubt on the conscious. To this effect, the dissertation goes in favor of environmental resource management blending the conscious and the unconscious, further exposing the challenges of the concept of sustainable use of natural resources. Overall, apart from its theoretical and policy contributions, it is worth mentioning that my research has resulted in fresh sets of descriptive ethnographic knowledge on the relations of the rural population to land, land-based resources, crops and livestock, adding onto the pool of descriptive and analytical knowledge thus far accumulated in this regard.

1.6 Limitation and Delimitation of the Study

It has already been clear that various factors are seen in an interlaced framework in this dissertation. The processual ecological framework in which smallholders-agriculture-environment nexus is analyzed involves social, economic, political, religious and natural environmental aspects. This has also been done at different spatial, temporal and organizational levels owing to the approach of the new ecological anthropology. This overall framework of analysis might create the false impression that the research is an over-ambitious project for its kind. Nonetheless, in spite of its overall emphasis on processual and interactive theory, the analyses of both local and extra-local factors have been quite selective and the focus still remains to be on the local. The political, administrative, legal and policy factors of regional and central government are considered, generally speaking, if they had immediate bearing on smallholders' management of land resources and their coping capacities to withstand or succumb to such environmental problems as soil erosion and drought. What is more, none of the policy factors reflected in this research are treated in a wholesome fashion but in respect to aspects deemed more influential, based on the perceptions of the research communities and that of mine.

In the new, processual and interactive ecological anthropology, analyses cut across different levels from the local through the regional, the national and even the global. Obviously, in such a project, this is quite unattainable for mere reasons such as its being an independent research carried out by a single hand. Because of this, all extra-local factors that are touched upon are relevant only in so much as they are helpful to understand, explain and interpret villagers' thinking and behavior. Therefore, the local remains to be the main focus of the research with its households and individual members and the immediate sociopolitical and natural environment. This has allowed not only to keep the study manageable but also not to run the risk of losing focus on the local which has been one of the cutting edges of sociocultural anthropology. The method of the new ecological approach, which is multidisciplinary and hence requires a team approach, should not be regarded as practiced in this research. Only some of its methodological principles are applied in as much as this is possible within the constraints already mentioned of this research.

Ethiopia is a diverse country socially, culturally, spatially and environmentally. This diversity is prominent even in agro-ecologies otherwise considered to be similar. Sedentary agriculture, agro-pastoralism and nomadic pastoralism are the most important economic occupations of rural Ethiopia. In this regard, the findings of this research are largely to be applicable to just sedentary mixed-crop-livestock agriculture in the highlands resided by the Amhara population. Even within this broader category, the research is more relevant to those categorized as drought-prone and environmentally highly degraded areas and the communities dwelling in these mid- and high-land agro-ecologies. Over the years, these communities have been significantly answering their food shortage from international relief handouts and development aid. Such agro-ecologies are also the ones that have been categorized by policy to be requiring low modern agricultural inputs such as chemical fertilizers and have to largely focus on diversifying local livelihood

opportunities, along with conserving and rehabilitating the degraded natural resource base (Lakew Desta *et al.* 2001).

1.7 Organization of the Study

This dissertation is composed of thirteen chapters. This chapter has set out the intentions of my research and introduced the people and area of the study. It has also set the research problem, questions, objectives, scope and significance. Chapter Two deals with methods and some of my research experience, not only to let readers know this, but also impart some lessons and reflections that have been drawn along this course. Ethnography is the main approach of the study while participant observation has been employed as the main data collection strategy. The chapter also presents the different data collection, storage and analyses techniques that have been employed, including the quantitative survey method to supplement my qualitative data.

Chapter Three is about conceptual and theoretical perspectives and approaches considered in the organization and analyses of the dissertation. Readers will be quite aware from the beginning that the research has been informed by a number of theories. The shift from single to multiple causations in the analyses of human thought and behavioral changes, including their relations to natural resources, has been emphasized in this dissertation.

Chapter Four is about the general nexus among smallholders, agriculture and the environment. It describes smallholders' perceptions and understandings of their immediate environment and the resources in it. It also documents and analyses how their perceptions of different resources, namely their affordances and constraints, have been changing over the years in relation to a number of local and extra-local factors. Thus, it also serves as a background to the rest of the dissertation.

Chapter Five mainly reviews and discusses the land administration systems since the second half of the 19th century. It also takes account of the 1975

Land Reform; the 1984/5 land redistribution, the resettlement and villagization programs of the mid-1980s and the resettlement program of the current regime. The main purpose is not the much belabored task of documenting the history of these programs but that of investigating their probable impacts on smallholders' management of land and land-based resources at local level. This is made with the view to also comment on the unresolved debate around the current land policy of the country.

Chapters Six through Ten are concerned with understandings of the major specific resources, their scarcities and abundances from local perspectives. These chapters specifically deal with the perceptual and cultural understandings of land and soil, rain, drought, crops, livestock and trees, in that order. Along with this, they also deal with how small farmers understand the human impacts on these resources in relation to agricultural production and food security.

Chapters Eleven and Twelve are more of behavioral accounts of the different response strategies employed against the different environmental agricultural resource problems studied in the earlier chapters, including the return impacts of the natural environment. These chapters are also where the perceptions and cultural understandings and the land administration systems and agricultural extension programs, including those discussed in earlier chapters, are put to the test of actual behaviors in relation to solving or exacerbating agricultural and socioeconomic problems.

Chapter Thirteen concludes the major findings of the research and reconsiders its theoretical and policy significance.

CHAPTER TWO: RESEARCH METHODS AND FIELDWORK EXPERIENCE

2.1 Introduction

Fieldwork and ethnography were the principal approaches to my research. The ethnographic fieldwork was carried out among farming communities in South Wello, northeast Ethiopia. It was, including the largely quantitative household survey, carried out for 13 months from July 2007 through October 2009. Documented data at district, zonal, regional and national levels were also used along the course of my fieldwork. The last month was given over to a largely quantitative survey in order to supplement the ethnographic data.

Non-directive questioning or interviewing, and participant observation were the predominant means to generate the required ethnographic data. Among the non-directive questioning are: key informant interviews, in-depth, panel-type interviews, group and focus-group discussions and extended case studies. Participant observation as a strategy that involved all the senses such as listening and seeing was made in the villages, in the farms, in the grazing areas, in public gatherings, in the markets and all other possible places of day-to-day social interactions. In addition to these qualitative methods, the research employed quantification both within the ethnographic setting and out of it within the general research area. To this effect, the detailed household questionnaire was administered by four trained enumerators and me. Questionnaires focusing on general information regarding agriculture, health and education were filled in by the respective offices in Wärräbabbo district. While data organization, classification and analysis began in the field, the period September 2009 to January 2011 was used for the analysis and writing of the dissertation.

This chapter does not just document methods of data collection. It also relates some of my experiences involved from the selection of a broader geographical

area for the research to that of locating an appropriate ethnographic site, including the reasons employed in their selection. Any research is accomplished within webs of challenges and opportunities, but space restraints mean that I will have to focus only on some of the challenges, opportunities and experiences of methodological relevance.

2.2 Research Methods

2.2.1 The Approach: Ethnography, history, scales and the inter-disciplinary quest

The relationship between anthropology and environmentalism was raised as an issue in the 1960s (Milton, 1993). What role or positions anthropologists should take, Milton (1993) said, was an issue inasmuch as environmentalism was not just a scientific but also a public commitment attached to the very sustenance of humanity. Thus, whether the anthropologist should assume "an active commitment to social reform" or "a detached observation of social processes" (Milton, 1993) was a question that needed an answer. It does not appear that this important question has been adequately answered today after decades of anthropological engagement with environmental debates. Of course, more questions could be asked regarding anthropology's involvement with environmentalism.

This is happening in a period during which anthropology has not satisfactorily responded to accusations that it is sick from romance of the quire, the aberrant and the exotic. Even in developing countries such as Ethiopia, most of the academic elites and those in the policy circle regard the discipline as anti-development, with its diehard disciplinarians who cling to the old and to the past. That means at least some anthropologists are resistant to change and not forward looking. I roughly recall that a scholar from another discipline once asked whether it was a tradition for anthropologists to fetch water from unprotected sources in a rural area when they could do this from running taps in towns. Very recently, I received a criticism from agricultural and literary

professionals that anthropologists are ‘quite primitive’. They made this remark amidst a discussion over the relevance of TEK and WSK. They were totally in favor of the latter, disregarding the former to which I was in support. I have received many such criticisms from some friends in other disciplines as well, during the course of my fieldwork in Ethiopia. Anthropologists’ intellectual affinity to the microcosm, I think, renders them less vocal among scholars of other social science disciplines, whose affinity is to the macrocosm. I presume accomplished anthropologists and their students would have more comfort discussing among their likes rather than those coming from other social science disciplines. In the face of this, I want to ask one important question: how could anthropology, be it as an active commitment to social reform or a detached observation of social processes, be able to communicate and interact adequately with other disciplines to offer its unique advantages which the others lack and to benefit from others which it lacks? To show its importance to others and learn from them, it needs to communicate across the disciplinary boundaries. And this becomes more profound dealing with a multi-disciplinary issue such as environmentalism. To my understanding, this is a question that needs to be addressed. In thinking this, I have the concern that responding to this question might invite the danger of losing the cutting-edge of ethnography. In this research, my intention to rise from the local to higher levels has been challenged by this contradiction to some extent.

A deeper understanding of the conditions of small-scale societies or humanity at large has been the cutting-edge of sociocultural anthropology. The choice between the anthropologist taking “an active commitment to social reform” or “a detached observation of social processes” becomes more important in view of this deeper knowledge which is not generally achieved by other scientists. In the face of this unique quality of anthropology, the discipline has not taken up the role of advocacy to improve the human condition as the other social sciences such as political science has. The focus of anthropology on small-scale societies has been the experience of the fledgling Ethiopian

anthropology as well. Secondly, not many anthropological studies have been carried out in Ethiopia compared to those done by historians, geographers, political scientists and others. These two conditions force us to consider another important scholarly question. This question, which could be considered, as a third point here, is that there are times in which the anthropological researcher has to willy-nilly depend on the works of these sisterly disciplines in addition to those done by anthropologists themselves. This necessity is compounded by another condition. The need to rise above the ethnographic site and connect local research with regional, national and international issues that have been impinging on the local, further necessitates the dependence of the anthropological researcher on the works of other social scientists. Many scholars from other disciples have accomplished remarkable achievements supplementing the role of anthropologists in Ethiopia. Dessalegn Rahmato is among Ethiopian scholars who could be mentioned in this regard. Finally, the need for inter-disciplinary research is necessitated by the complexities within which small-scale rural societies-even the remote ones- are living in relation to states and the international community, especially because of increasing globalization. Despite this, the research remains ethnographic and anthropological but has worked through its implementation to balance the conditions just mentioned. I take the middle ground between the roles of "an active commitment to social reform" and "a detached observation of social processes". In so doing, I consider "the minutiae of cultural change" anthropology has been best at (Milton, 1996, p. 15) while giving some attention to the "big picture", "large scale social movements" and "worldwide communication systems" which the discipline has been criticized for ignoring (Milton 1996, p. 15).

2.2.2 Ethnographic Site Selection: *Why study three villages rather than one?*

Among the Gäddärro people, the term village signifies not only a spatial but also a social and political concept. One of the major defining factors of a *got'*

that is a village is membership in the community self-help association known as *k'iré.* While, generally, houses that have physical proximity to one another are found in one *k'iré*, thus forming a village, there are some instances in which because of differing *k'iré* membership such houses belong to different villages. There are a number of factors that lead to this 'aberration'. When a household belonging to a *k'iré* in a certain *got'* runs into conflict with the majority member of that *k'iré,* the leadership or some important members, the household could pull out its membership to join another *k'iré* in a neighboring village. Upon this, such houses will be re-grouped into this village without involving spatial movement at all. For outsiders who go with a different cognitive schema of a village, it is difficult to understand village boundaries in the beginning. As a result of this social reason, village boundaries and their members in local conception vary from time to time.

Secondly, at the beginning of my exposure to this fieldwork setting, the villages of Awrraça and Mïsïräta were being mentioned to me quite interchangeably- at times as one and at another as two villages. People were doing the same towards the end of my fieldwork in October 2009. Fortunately, it did not take me long to find out the truth. Awrraça village, believed to be as old as 150 years from local genealogical considerations, and composed of just eight households when it was then incepted, was one of the villages in Gäddärro FA to be relocated into two sites in the FA during the villagization program of the *dergue* regime. This happened following the severe drought and famine of 1984-85. One of the villagization sites was located within the territory of village Awrraça, hosting households drawn from Awrraça itself and many other villages in the neighborhoods. When after a couple of years it was declared by policy that living in villagized sites was completely optional, except two households, the rest pulled back to their former homesteads and villages. At that moment, the part of Awrraça village, which was close to the abandoned villagized site, retained the popular Amharic word for villagization, which is Mïsïräta. The rest part of the old Awrraça (it could be

called mainland Awrraça), reoccupied by its former residents, regained the former name, Awrraça. The two villages were also officially separated after some time. Their social, economic and spatial interaction encouraged me to consider both of these villages.

Thirdly, farmers living in a village have farmland, grazing land and bush land holdings in other villages within the boundaries of their FA. Therefore, the cross-village social and economic relationships thus created, not only justify the need to work in a number of villages, but necessitate it. Fourthly, apart from this official access to land and land use right, to some extent, customary inter-village land-based interactions between members take place in the form of different sharecropping, land lease and livestock bondage arrangements. Fifthly, differences in micro-ecologies among neighboring villages of the same agro-ecological zone in many instances could result in farmers' perceiving and behaving differently in crop selection, planting time, harvesting and other agricultural resource use decisions. Therefore, in order to capture diverse ecological thoughts and practices these variations could offer, it was methodologically advantageous to base my ethnography in a number of villages rather than one. Finally, the relatively small number of the cumulative households in the three adjacent villages, which were about 140, and the physical proximity (even overlap) among them, which literally left no spatial gap, made a close, day-to-day contact with their members quite possible. This allowed doing participant observation- the principal strategy of my research- without affecting ethnographic depth.

Therefore, because of the above-mentioned reasons, I opted to establish my ethnographic site in three contiguous villages. Even then, this does not mean that I have not enhanced and improved my knowledge and insights of the field from the neighboring villages covered in my reconnaissance visits.[24] These villages are all located very close to one another occupying a mountain massif

[24] I will also employ these villages as aides of comparison and contrast in order to facilitate analysis and interpretation of findings from the three ethnographic villages.

and sharing a number of institutions together, such as the *k'oti* institution. In so doing, I have worked to achieve balance between depth and local ethnographic diversity, a perspective which could have been missed had I studied just a village. (The different lines of social interactions among these villages are presented as Appendix 1)

Plate 1: Partial view of Mïsïräta village where my ethnographic residence was

2.2.3 Data Collection Strategies and Techniques

Participant observation

Lofland and Lofland defined participant observation as, "The process in which an investigator establishes and sustains a many-sided and relatively long-term relationship with a human association in its natural setting for the purpose of developing a scientific understanding of that association" (1995, p. 18, as cited in Boeije 2010, p. 59). In this and many other definitions of

participant observation, the concepts of relation, sustenance or long-term maintenance of that relation, naturalness of the research setting, involvement in all aspects of the peoples' lives and many other aspects allowing a researcher to achieve as close relationship as possible and experience with research partners are emphasized. This is the hallmark of sociocultural anthropology/ethnography and the setting is fieldwork. In this regard, I have had an extended fieldwork among my field partners. I had lived there for an entire period of 13 months between July 2007 and October 2009. In order to create the rapport necessary to allow me document and "describe what happens, who or what are involved, when and where things happen, how they occur, and why things happen as they do from the point of view of the participants" (Jorgensen 1989, as cited in Boeije 2010, p. 59). I have also taken considerable time expressing my objective, how long I was going to stay there and why.

The good relations I established have assisted me in learning a great deal from these communities in a relatively well-stretched, naturalistic and interactive manner. Thus, my participant observation resulted in rich understandings of the farming activities, livestock rearing strategies, natural resource management techniques, drought coping mechanisms and many more diverse qualitative data and information. Through participant and direct observation I considered all the three major research questions of this project. Except those issues which required historical information and structured quantitative data, observation was the predominant strategy of data collection. I had employed several social and physical settings for my participant observation.[25] For

[25] (1) Crop fields and grazing lands; (2) threshing grounds; (2) bush and forested lands; (3) water points, especially during the 2008 water scarcity when villagers ran into conflict nearly every day; (4) tree planting as well as other soil and water conservation activities; (5) local-level official meetings; (6) local village meetings; (7) arbitrations which were quite often in relation to boundary and other natural resource use conflicts; (8) market places; (9) traditional prayer services; (10) farmers training sessions and farmer-agent interactions; (11) relief/paid-food /cash distribution occasions; (12) wedding ceremonies; (13) leisure times accompanied by *çat* chewing; (14) burial services; (15) condolence places and many other smaller places, occasions and events were employed to facilitate my observation.

instance, I would not have been able to figure out the extent to which indigenous and imported trees are cut to cover the inner dent of the grave called '*alhad',* especially in villages where stones are scarce. This also gave me some sense of the potential threat of this to the already endangered indigenous trees in the area. One of the reasons for male child preference was revealed to me here as sons or male next of kin were called on to ritually start the digging of a gravesite *(fäläma)*, as a person transforms from the *'on the land'* to the *'in the land'* concept of being.[26] If it were not for attending services organized for the dead and some wedding ceremonies, I would not have been able to note how food and firewood were extravagantly used during these occasions.

Although I was not formally admitted to the *k'iré* of these villages as a member, I was fulfilling some of the membership obligations voluntarily. This included giving some money to the bereaved at the death of a family member or relative as well as paying contribution when mundane and religious feasts were organized. In my observation, I had included men and women activities and of course that of the youths. Therefore, through my active and extended living among these people, I have been able to gather the necessary qualitative and quantitative data on their lives, TEK, environmental problems and responses. While as Young (2004, p, 162) maintains there are many more things to observe in the field than are necessary for the objective of a study, I have tried to guide my observation by the overall guiding relationships of my study. He said, "Generally, the formulated hypothesis [my guiding relationships] is the guiding element in the immediate observation (Young, 2004, p. 162). This, however, should not give the impression that all 'things and facts' I observed were recorded and all recorded things and facts were exhaustively used in the preparation of this report. As with the experience of

[26] This could be well linked to male preference in their reproductive practices which is also likely to increase population growth.

many students of sociocultural anthropology, things and facts not immediately used as such might be so in the development of their future career.

Non-directive Questioning

Writing about Matthews, Boeije said, "Matthews states that researchers do not ask questions to elicit answers to specific questions but rather to make it possible for participants to talk about something in their own words" (2010, p. 63). Boeije does not subscribe to this remark in full but recognizes that the role of the interviewer is to be a facilitator to let interviewees share part of their lives in their own terms. Pauline Young underlines that in non-directive questioning (as against directive questioning) the interviewees are let free to talk, "to dwell on whatever events seem significant to them, to provide their own definitions of their social situations, report their own foci of attention, reveal their attitudes and opinions as they see fit" (2004, p.218). The experience of this ethnographic research verifies both points of view.

Farmers' descriptive and expository ability of their environment and its components is more elaborate and complex when seeing precedes talking or when talking is accompanied by seeing. This "talk-see" technique enabled farmers I met with along my observation in providing detailed names for different types of soils, including their detailed attributes. At individual or group discussion sessions in formal contexts, I was not able to get as deep and rich information, especially on soil types. And I have proved that this was true in subsequent observational interviews I had. Finally, I have to say that non-directive questioning had assisted me in finding the required data.

Group discussions

About four to eight people were normally involved in the group discussions I had with my field partners- men, women and youths. Most of the discussions were gender specific but in some cases men and women were involved together. Groups dealt with thus came in different forms. According to the

custom of *çat*[27] chewing ceremonies among these people, as in the rest of Ethiopia, groups usually congregate in tree shades, in someone's houses, or any convenient place in the villages or in the fields. The village in which I established my residence was also one where the Gäddärro FA administration office, the agricultural extension office, the health post, a primary school, the police station, two flour mills, three small shops and three tea rooms were located. Therefore, it could simply be said that this village was the hub of socioeconomic and political activities in the entire FA. This was an added advantage to talk with groups with and without prior arrangements.

In order to facilitate these discussions, I employed semi-structured and unstructured questions. In fact, as I progressed with the research, a sort of mental lists of questions were developing in my mind for the different topics I covered through group discussion. Questions relating to all the three major research objectives of this project had been considered through group discussions as well. The group discussions were also dynamic.

In-depth/key informant interviews

The people of Gäddärro say "to be knowledgeable, it takes good heart". In many Ethiopian languages, especially the Semitic ones, humans think in their hearts as well and not only in brains. Because of this, specialist knowledge among these people is not necessarily reserved to the aged. People of younger ages could be so knowledgeable as far as they have this 'good heart'. My field assistant, Yïmam Mähammäd, was said to be such a person. In this research, I have worked with a number of people as my key informants on many issues from the beginning to the end of my fieldwork. Written documents on village

[27] This is a mild stimulant tree crop whose leaves and tender twigs are chewed on for their stimulating and hilarious effects. The crop is grown in Ethiopia, Kenya, and Yemen and to some extent along the east African belt down to South Africa. The tree has not been classified as a 'hard drug' by the UN based on tolerance and withdrawal effect, the two criteria of doing so. The detailed sociocultural and economic aspects of this crop among the Oromo of Harar, where this crop is most intensively cultivated and perhaps consumed in the world, is given in a study made by Mulugeta Gashaw (2011).

life are scarce in Ethiopia, especially when we go further back in time. For instance, I was not able to find out any document hinting on the historical introduction and development of agricultural extension service delivery in the district I studied and even the entire South Wello zone. One of my most prominent key informants in this regard, Ahmäd Nuriyyé, from Absaro, remarked, "You keep things on paper and do that one after another but we keep them in our heart and have limited things to store and remember".[28] In such contexts, the importance of oral history and local historians cannot be overemphasized (Neubeck and Glasberg, 1996).

In general, my key informants were drawn from villagers; FA officials; agricultural development agents; the school principal in one of the schools in the Gäddärro FA, officials and experts at district levels and a few young men. Most of them were from the three core villages I studied but some prominent ones were also from other villages, namely K'és Gända, Bäk'alo, Hulluk'o and Säybäro.[29] The three agricultural development agents stationed in the village as I was, were prominently useful in teaching me the technical aspects of crop production, livestock rearing, and natural resource management. I also learnt much from them about farmers' reaction to extension services and input deliveries from an expert's perspective.

Case study

In this regard, I have taken individual farmers and their experiences to illustrate some important aspects. For instance, the experience of two farmers in Mïsïräta and Šola Gända who on their own initiatives experimented the advice given them by development agents to intercrop maize and horse beans

[28] Field notes

[29] Some of these elderly men, believed to be as old as more than 100 years, passed away while I was in the field and was planning to work with them more. Some were rendered sick and incapacitated during the time I left the field. This will have negative impact on the documentation of local history and endangered or dying out IEK in Ethiopia.

but found it did not work for them is important. This shows farmers' rejection of modern technologies is not to be simply made on cultural/traditional basis as it is presumed. In another village, I have a reported case of couples who explained out the death of their animals by their failure to organize a propitiatory/sacrificial ritual they were advised by a *k'allïççа* (a sheik) and other men. This is also an epitome of the role of religion in their resource management. I have a documented case in which a farmer bought and resold many animals within a couple of years, earning more than seven thousand Birr.[30] This represents the increasing economic significance of animals and the shift from 'rearing' to 'keeping' animals as an environmental response.

Review of documents

I have reviewed several plans and implementation reports of the Wärräbabbo Offices for Agriculture and Rural Development as well as Land Administration, Use and Environmental Protection. Policies, strategy papers and guidelines on crop production, livestock production and natural resource management, including those developed at zonal, regional and national levels were also consulted. Some of these policies are the national environmental policy, the national disaster prevention and preparedness policy as well as the national and regional land use policies. At the district level, I have spent about three weeks in search of both quantitative and qualitative data. Primarily, I was involved with several department heads and experts at the district Agriculture and Rural Development, and the Land Administration, Use and Environmental Protection Offices with the primary aim of getting district level data. This has also enabled me to expand my knowledge on how these government structures channeled and implemented policies and programs among the rural communities. Therefore, I had visited their documented data (even though documentation was poor) and interviewed many officers and experts working in the fields of crop, livestock and natural resources

[30] The Ethiopian currency

development; environmental protection; land use and administration. Some staffs of the national NGO, Water Action, have also been a source of information specifically on natural resource management and overall information on the district.

Questionnaires

Household survey questionnaire

A survey questionnaire was developed according to my intentions when I set out to the field in 2007. The primary objective was to supplement my ethnographic data with some quantification in some of its aspects. For instance, rather than saying households own small land, it is better to show how small that is. Currently many farming households are engaged in tree planting as part of their basic subsistence and coping strategies with such problems as drought and land shortage. Therefore, my questionnaire had captured the quantitative aspects of this and many other issues. I have learnt from its exercise as well apart from the data that it has generated. In this regard, for instance, the distinction between "raising" and "keeping" livestock was accidentally revealed as a result of this survey.

Structurally, the questionnaire was divided into 12 parts, the major ones being crop production, livestock production, tree management, soil and water conservation, agricultural extension and international relief aid management. A pretest was made before the actual survey was conducted. As it should be, most of the questions were close-ended, with some open-ended ones. Finally, I carried out a census type survey involving all eligible households in the three villages except some who were not available. (This questionnaire is presented as Appendix 2 involving parts that were intensively used in this dissertation).

I administered roughly more than 60% of the questionnaires whereas the rest were handled by four young men: a high school graduate, two diploma holders and an undergraduate student. I gave a short orientation to them but

they were already familiar with the study from my ethnography and some of them had prior experience administering questionnaires. It took us more than 10 days to complete the survey in October 2009. I did the data entry (SPSS) with some support from a friend and that took us more than eight days' intensive work. Altogether, 132 households were included from about 140 eligible households in the three villages. The language of the survey was Amharic spoken as mother tongue both by the survey participants and the enumerators who worked with me.[31] The use of quantitative survey questionnaire after most of the qualitative data are collected could be called 'theoretical quantitative interviewing' following "theoretical sampling" as one of the grounded theory procedures. As the sampling of the grounded theory is based on earlier theoretical trends in the data, so is theoretical quantitative interviewing grounded in the general theoretical orientations of the ethnographic data already constructed.

Questionnaires filled by government offices

In order to get background demographic, agricultural, health and educational data, questionnaires were distributed to the Gäddärro FA Agriculture and Rural Development Office as well as the Wärräbabbo district offices for Agriculture and Rural Development, Education, and Health. Largely, I have been able to get the data I was looking for from these offices.

2.2.4 Data Capturing and Storage

The ethnographic interviews, conversations and observations were generally taken note of in three ways: 'mental notes', 'jotted notes' and 'full field notes' (Bryman, as cited in Wilkie 2002; Hamersley and Atkinson, 2007). This was made based on the contextual necessity of the fieldwork condition. To mitigate problem of memorization, I have tried to put mental notes on paper

[31] Dialectal differences as part of the challenges in fieldwork were resolved ahead of the administration of this questionnaire. Of course, the questionnaire itself was developed taking note of the local dialect.

(Bernard, 1988) (at least into jotted notes) before allowing further talk in between as much as the field context permitted. To supplement the limitation of note taking by hand (Hamersley and Atkinson, 2007), I have tape recorded part of the interviews and group discussions. Immense visual images were captured in the field, some of these facilitating data collection and rapport with local informants. They were also re-scrutinized to facilitate further memory, analysis, explanation and interpretation in the process of the write-up of the dissertation.[32]

2.2.5 Data Analysis

Data analysis in ethnography is quite processual and permeates the entire research process (Hamersley and Atkinson, 1995, 2007; Sarantakos, 1998; Punch, 1998) unlike in other approaches such as the survey method. Because of this, and the nature of ethnography, analysis begins in the field following and leading to further data collection (Hamersley and Atkinson, 1995, p 205; Sarantakos, 1998; Punch 1998). Data analysis of the quantitative household survey was accomplished through the help of the statistical software, SPSS, with some assistance from a friend. I made the interpretation of these data, which were also complemented by and synthesized with the qualitative data, based on experience, prior knowledge and theory.

I had kept analytic notes and field notes to identify key analytic themes and keep track of the research (Hamersley and Atkinson 1995, p 191). This has involved summarizing, coding and categorizing or classifying to look for themes, patterns or inconsistencies against expectations or theories (Boeije, 2010; Hamersley and Atkinson, 1995; Punch, 1998; Sarantakos 1998). This has served to strengthen analysis and guide further data collection. Then, the data were organized along the major themes derived from the categories in order to answer my research questions. I have also employed myths and

[32] As we lack visual documentation of the environment in Ethiopia, I hope to keep and share these documents as my archives and make use of them for further studies.

figurative languages (e.g. metaphors) (Punch, 1998) to understand and analyze peoples' experiences and interpretations of their environmental resources and constraints.

2.2.6 Dissertation Write-up

The analytical notes, concepts and categories found from the data as well as the themes or findings in relation to my research questions were employed in drafting the dissertation. The write-up of the dissertation, in a sense, had gone along with the data collection process. I had adopted this style especially after I was more than half way in the data collection process.

2.2.7 Dissemination of Results

Beyond the PhD thesis, I intend to disseminate my material as a book or series of articles or book chapters. Institutions such as the British Institute in Eastern Africa, the Italian Institute for Eastern Africa, Addis Ababa University, Forum for Social Studies in Ethiopia and the journal-African Studies Review are envisaged as possible opportunities to present or publish the results of my research. I chose these institutions as they are already engaged in the publication of academic (and advocacy) researches on Ethiopia and other East African countries.

2.2.7 Ethical Procedures

The necessary ethical preparations and clearances were obtained from the University of Alberta before taking to the field to carry out the research. All ethical issues have been duly observed. In Ethiopia, all the necessary research clearances have been duly secured from the national to the grassroots level. There was no problem encountered in fulfilling ethical requirements. For the most part I have used pseudonyms to refer to my informants except in few cases of my key informants who I felt need to have their real names mentioned as a way of further acknowledging their extraordinary contribution.

2.3 The Fieldwork Experience and Some Reflections

2.3.1 Getting In-country Research Clearances and Access to the Field

I submitted the letter of support for my research from the University of Alberta to the Addis Ababa University some days after my arrival to Ethiopia in May 2007. It took me eighteen days to have the in-country research clearance from the office of the Vice President for Graduate Programs and Research. I think that was thanks to my persistent follow up. Nonetheless, I still feel indebted to this office because some researchers I knew had to wait for more time in previous years. In the meantime, I confirmed that my earlier selection of South Wello was still in line with my research priorities.

Leaving the capital, Addis Ababa, I arrived by road at Dessie town, the zonal seat for South Wello, ANRS, on the 24th of July, 2007. On the 25th, I talked to the zonal administrator who was so cooperative in granting me an oral permission to start the research based on the letter I was issued with from Addis Ababa University. Once I identified a district after consultations and field visits, I got a letter of support from the zonal administrator addressed to the district administrator. On the 9th of August, I set out to the small town of Bistima, seat of Wärräbabbo, the district I chose as my research site after investing two weeks for the purpose. In collaboration with an expert from the district's Agriculture and Rural Development Office, I chose a Farmers Association (also called Peasant Association) as my research site and got a letter of support from the district administration office to the FA office. On the 11th of August, I submitted this research clearance to the chair of the PA. That put an end to the long process of obtaining a research clearance and a general ethnographic area.

2.3.2 Selection of Ethnographic Research Site

At the national level, theoretically, it was my duty to choose one from among nine regions and two administrative councils in the country. Practically, however, I tended to emphasize on those regions that have been severely affected by repeated drought, continuous moisture stress, crop failure, famine, food insecurity, land shortage and other aspects of environmental degradation. Thus, my choice ended up being a selection rather than a random choice. Basically, I adopted a number of criteria based on the subject matter of my research and the questions I wanted to answer. Presumed long-standing history of human habitation and the long-lasting feudal system which was based on land had also made me focus on north Ethiopia.

Accordingly, I chose Amhara National Regional State. Based on my earlier knowledge and consultations with some researchers and consultants, I purposely considered South Wello zone from several zones within this regional state. I did this, among others, because this zone was one of the most seriously affected by the 1974-5 and 1984-5 droughts and famines. It also presented one of the most degraded environments and long trace of human habitation on the environment. Then, I selected the Wärräbabbo district from this zone on the basis of field visits and consultations with district and zonal officials and experts.[33] (The selection criteria for the district are presented as Appendix 3). I did also talk to some NGO staffs in the zone. Then, five possible Farmers Associations were selected and visited. I chose Gäddärro FA (also code-named 07 FA) as my ethnographic research site. (The selection criteria are presented as Appendix 4). Basically, all served the purpose but I thought Gäddärro did better. Gäddärro is found at about 10 kms from the district seat, Bistima, and at about 50 kms from the zonal seat, Dessie and 460 kms from the Ethiopian capital, Addis Ababa.

[33] I had also interviewed a number of officers and experts in Dessie Zuria, Tähulläddäre, Kutabärr, and finally Wärräbabbo district.

2.3.4 Choosing Ethnographic Villages and Getting Started at Community Level

Carrying my household articles and research amenities, I hired a public transport and left the town of Dessie on the 10th of August 2007. I arrived at the district seat, Bistima, around 3:00 p.m. local time. Unfortunately, the few medium-duty trucks that also carried commuters had already left. I made a desperate attempt to arrange for a drive with the local government offices but it was of no avail. That apparently meant for me to pass the night in the only poorly furnished and rowdy inn in the center of that small rural town. More than this, however, my enthusiasm and urge to get started in the field got better in me and I accepted the offer from a tractor's driver and his aide. They were bound to Gäddärro carrying massive loads of modern bee hives and other items. By this time it was already 4:00. I kept behind my laptop computer and other sensitive items and loaded my bags on the tractor's trailer. Then I was connected to a person who was destined to his village in Gäddärro. That was how I was forced to travel on foot with him as he rode a mule. As I never did, I was not able to accept his offer for a ride. After 2 and half hours' travel on foot and climbing a long uphill and then descending, we arrived at Gäddärro during dusk. My packages had already arrived and several pairs of eyes were waiting to see their owner. I knew nothing of where I could spend the night because my attempt the day before to come here to pre-arrange a shelter was a complete failure as I had to go back to Dessie from Bistima for lack of a means of transport. Thanks to the acting head of the district Agriculture and Rural Development Office and the development agents and some health staffs in the village of Mïsïräta that ended to be my ethnographic residence, they already had one-room space for me where I could stay for the next two months. The next morning, after submitting my research clearance to the FA chair, who along with other cabinet members warmly welcomed me before two days, I was automatically allowed to start work. Through the two

development agents who were available at the time, I got a man, Gäbré[34], who worked with me as an assistant at least for the start.

2.3.5 The Introduction Process: Knowing and getting known

Knowing and getting known to the community was very pleasing. The next morning after my arrival I availed myself of the opportunity to know government personnel in the FA and the executive members of the local administrative council. On the following days, I extended this process to adjacent villages of Šola Gända, K'és Gända, K'ädida, Awrraça, Absaro, Binné, Kibi Méda, Wärrä Ruga, Wärabäïti and Wäsänä Bäddéssa. These villages formed most of the highland and mid-highland communities of Gäddärro FA. For the most part, this visit involved traveling and observing social and natural physical settings, farmlands, water points, livestock grazing/feeding places; erosion affected areas as well as deforested and re-vegetated places. It also involved me impromptu interviews and discussions with the people I got along my way. Among very striking parts of this visit and introduction to the general populace and landscape were the naming of villages, the protection of graveyards that have survived as forested patches and centers of diverse indigenous plant species. Also remarkable were the high intensity of soil erosion and denudation. This process lasted for about eight days and it was extensive enough to let me know and get known to most of the members of these communities. When I had the confidence that I knew the people and landscape reasonably well, I started organizing group discussions and key informant interviews with men and women. I did this in each of these villages before deciding in which villages to focus my ethnography.

[34] This was his nickname in theory but his proper name in practice. I found out this quite after some time and never did I use his proper name addressing him because no villager normally did so. It is interesting to note that nearly all adult and young men to some extent have nick names in addition to their true (first) names. As an exception, I was told only a man in one of the ethnographic villages was not given such a name because, as villagers said, he was sort of hot tempered and not amenable for nicknaming. As a custom, every adult man is called by his nickname and only sometimes, mostly official documentation, are proper names used. I did ask to know the reason behind nicknaming and its customary use but did not find an answer.

2.3.6 Community Feedback

The people I worked with were so friendly and receptive such that a stranger might forget being in a new environment. I was warmly welcomed by men, women, children and young people alike, who also wanted to assist. During my introduction, the most important challenge, however, was to prove how the study was going to positively affect their life. I was quite explicit and direct that the work was academic, with some expected contribution to policy but with no immediate action resulting from it. However, this question was persistent than I expected. In this regard, that ethnographic research is less known, or perhaps even unknown, among the public in Ethiopia has to do something with my research experience. It was enjoyable explaining what this 'esoteric' research approach called ethnography demanded. The important thing, however, was not that. Among villagers, government personnel and administrators, I could feel the positive attitude and earnest cooperation this had created towards me and my work.

Even though I went through all these introductory processes, getting the necessary trust for such a fieldwork was not straightforward. This had some bearing on some of the data collected in the beginning. All researchers are in this regard suspects among rural communities in Ethiopia. So, both men and women needed more time to know me and my mission than I thought it was necessary. Probably because of my gender or for reasons I could not figure out, in the beginning, the women appeared more suspicious than the men. This suspicion however was not reflected in their acceptance of me as a researching student. There is a difference between accepting a researcher and opening up for a study. I have sensed a widespread feeling among both villagers and FA administrators that they are responsible to accommodate researchers who get access to their villages through government. This, nonetheless, as I already suggested, does not mean that it guarantees an immediate access to their hearts and minds which is different from being accepted as a researcher. This

was quite a process and living together with them quite closely and practicing the basic cannons of ethnography was certainly a reliable solution.

During some of the discussions I had in the beginning, I heard many women say they did not have a shortage of fuel wood, describing the affordances and scarcities of their natural environment. A number of men and women tended to conclude that they faced no shortage of agricultural land at all. Even though latter data had confirmed to me that they had a different way of looking at land shortage to what I have learnt from the literature, in the beginning, many were not speaking to me to their hearts. Not so long after that, I was able to find out that there was a suspicion that if they gave me the information that they had these problems, they might be destined to a forced resettlement to faraway, hot and malaria-ridden places in the region. After two months or so into my fieldwork, I was able to find the necessary trust to allow a reliable ethnographic research. The hospitality and cooperation of the Gäddärro community and its local administrators could not be exaggerated. The agricultural development agents and the two staffs of the health post that was under construction as I arrived had also been remarkably supportive in facilitating my integration with the community and the process of data collection.

2.3.7 The Nature of Some Ethnographic Questioning

At a group discussion with four young men in Awraççа in August 2007, on the topic of natural resources and their degradation and conservation, I realized that I was unknowingly projecting my expectations into the response of my informants. This had happened irrespective of my awareness of the challenges of value judgment in research. As some anthropologists have argued, humans are inherently biased and it is difficult to be free from this frailty. I used to subscribe to this thinking as I do now. For such writers, therefore, what is important for a researcher is not to struggle not to be value free, which after all is impossible, but to guard one's value judgment

constantly from affecting one's observation and findings. This was among the key research advices I went into the field with. While I think I had been generally successful in so doing, there were some instances in which I were not. I would like to write about a couple of them in what follows.

In the afore-mentioned group discussion, I made an attempt to know the list of local natural resources in order of their importance. After a brief confused pause, one of the young men exploded 'air'. At this, I unconsciously sent an inquiring eye to the rest of the group. I thought I read some kind of momentary hesitation from them which I took to mean their friend had erred. I did not miss the point that 'air' was a resource. Nonetheless, my expectation was revolving around such things as land, soil, water-those natural resources on which my proposed research was concentrating. To borrow Ingold's terminologies, I was *pinning* a meaning *on* their response rather than *picking from* it. No longer than I thought they were to oppose their friend, they all uttered that he was quite right! At this point, the first speaker broke the silence as if he was encouraged by their acceptance to talk more. He said, "You know when we for the first time come out of our mothers' wombs, we need to breathe air in order to keep alive. If not, we could not grow up as a child and then become an adult and if so we could not be able to make use of the natural resources we have in our environment."[35] The rest were also satisfied by his explanation. Even though the response was out of my expectation, I also got some sense of satisfaction from this young man's analysis.

With this mood, I inquired to know what they had to give in the run-down I was expecting. The young man who still took the floor said "nature" and all the rest conceded to it. I further asked what they meant by nature. All responded "rain" at the same time. I raised my voice for a third item but my enthusiasm for a long list looked not to be realizable. All posed for a few seconds and I thought they were squirming to throw more words, perhaps

[35] Field notes

enriching my expected list. I let them have a longer pause but that did yield nothing. Then, I broke the silence to find out what was going on around. They replied, “But we have said nature. Yes, that is it”!

I further tried to make the point clearer that I was looking for a third item among the natural resources they had in their environment. They did understand my point very well but their difficulty was that there was no simple answer to it in their local idiom, in the way they gave a mental structure to the natural environment around them. As a way of satisfying my exploration, they said that if nature was there, then everything was there, too. After this, through prompting, a long list of natural resources was developed.

In a similar vein, the other methodological experience I want to relate here has to do with my cumulative fieldwork experience among these communities. I had learnt that the way we coin some questions in the field are at a level of abstraction not simply comprehensible to our informants. In my experience, this had happened even when most of my questions were “studied” or “rehearsed” at the beginning of my fieldwork. I found some of the questions I was raising were not amenable to immediate or simple breakdown into empirical statements that respondents could pick up easily. One of such queries in my case concerns the relation between livestock and religion or the religious aspect of livestock. Questions like “what places have livestock in your religion?” or “What do livestock mean in religion to you?” were not comprehensible to most of my informants. All the same, other interviews or discussions made in the context of other sets of questions relating to livestock management, resulted in rich data and deep understanding regarding the nexus between livestock and religion or the place of livestock in their spirituality. On such interviews, not only I was able to get what I intended, even though at times the discussions had somehow to detour from what I intended initially, I was also able to get useful information and understanding on bigger questions that I did not in the beginning break down into easily understandable data

collection questions. This technique of interviewing that is allowing some detouring or just playing the role of facilitation had helped me a great deal in tackling some of the data collection challenges in the field. This is part of the non-directive questioning I employed.

2.3.8 Ethnography: Its Relevance and Challenges

A range of difficulties are to be faced and largely overcome if a research project is going to be a success. All the same, that some communities and societies are harder than others to open up might need to be empirically tested. And researchers trying to find their lot within such communities, as I did, perhaps need to be prepared more than others. Ethiopians at large, irrespective of their ethnic and regional sociocultural variations, might be considered amongst the hardest to open-up for a research. Mesfin Wolde-Mariam wrote:

> One of the most serious handicaps in undertaking studies in the Third World, especially in countries at the bottom like Ethiopia, is the problem of measurement. Precision is not an Ethiopian characteristic. In fact, to be deliberately vague and abstruse is a virtue and the mark of a gentleman. There is some element of vulgarity associated with total openness and clarity. It is this psychosocial behaviour that is frustrating to the researcher in Ethiopia, especially rural Ethiopia. (1991, p. 11)

At first sight, such statements might give an insurmountable picture. They should not, however, as they should mean different things to the ethnographer and the non-ethnographic researcher. For the ethnographer, they should merely serve as critical advices to guard against their negative effects through strategies already at hand-participant observation and prolonged fieldwork. For the non-ethnographic researchers, especially for those working on the basis of the politically powerful technique-the quantitative survey questionnaire- in short-termed and hit-and- run type of research contexts, this warning is likely to be foreshadowing much confounding of research findings. Ethnography has a strong aspect in this regard; although its strength could be a source of its challenge as well.

The experiences of this research attest that the above quotation is well in line with what is found at the grassroots in northeast Ethiopia. A point which is equally, if not more, vulgar and which by no means the above meticulous writer misses to notice, is to want to have one open-up just in the first few encounters to life-time strangers. Not to open-up so quickly to strangers might be a self-protection and when so, there should not be aberration in that. My ethnographic experiences verify this quite well and are replete with a host of insightful cases some of which are shared in this writing. Of course, popular lack of experience with research in societies like Ethiopia, where there is hardly the faintest link between research and communities, is a reason so sufficient to render the public quite suspicious of researchers. Nonetheless, even in societies where this is the norm, some aspects of life could still remain hidden well after the ethnographer has established trust and rapport with the people. It costs nothing or very litter, if social researchers left some buffer zone to their informants. And allowing this should by no means be interpreted as a sign of lack of gaining full trust on the part of the researcher. Rather, I argue, it should be considered as one of the many ethical considerations to be respected. Not many of the social environmental researches require intimate communication but a genuine and culturally sound rapport to be best achieved by prolonged fieldwork and participant observation.

The problem of measurement in data collection is still a factor, especially in rural Ethiopia. We should count on Mesfin's remark, "At times it appears that peasants have an aversion to precision" (1991, p. 11). In this study, this was reflected especially in the survey as in such variables as age, number of trees owned and land holding. It was not uncommon for individuals as old as 50 or 60 simply report they were just 30 or 35. When this was doubted, in a clear sign of lack of interest, many responded something like, "get it 70, if you like". Sensitivity to age that one finds in urban Ethiopia or western societies, most remarkably among women, is universally lacking in the rural setting I studied. Many farmers showed negligence in reporting tree ownership if they

considered these resources few in number. Therefore, a person having two or three trees might report s/he has none at all, thinking that they are not worth reporting. This difficulty has extended into many other variables considered in the quantitative household survey. The problem was challenging but not insurmountable. Probing was of tremendous importance. Though not as much as in the survey, this hidden notion of what I would like to describe as "a bare minimum reportable data" seems to sit at the back of the mind of informants in ethnographic interviewing as well. Then, the question is how should ethnographers deal with this? Or, should they just forget it as an *ethnographically insignificant* problem? From my experience in this research, probing, explanation and re-explanation of questions as well as getting the entire research community understand what the research was all about persistently and patiently have proved to be quite useful to deal with this challenge.

Moreover, in the case of my ethnographic interviews, earlier site visits, daily on-going reconnaissance and developing a strong mazeway of the social and the natural landscape did quite well to uncover apparently small, yet critically important data and information which could have remained undiscovered. In the case of the survey, a pre-test, further clarification (including the purpose), linking the interviewing with already acquired knowledge of the households and the area at large, were of tremendous importance. As already mentioned, probing was crucially important. This should not give the impression that the internal validity of the questionnaire was affected. All possible precautions were made to avoid this from happening, including the use of local terms, concepts and categories which I have tried to follow meticulously.

2.3.9 A Few Words about Research Ethics

I have already mentioned that the ethical requirements of this research were duly fulfilled at all levels of concern. Their implementation had also gone

quite smoothly in all respects. Here, I just want to raise two instances that the issue of research ethics is really subtle and culture specific.

It was after I was some months into fieldwork that I learnt that I had been a cause of concern for one of the villagers who later became one of my close friends. It had so happened that this man of about 60 years of age was one of the people I talked with much during the first days of my fieldwork. This was the period in which I was not even taking full notes of the conversations I had with villagers and I was not even carrying field note and a tape recorder along with me till such time that I established a reasonable degree of trust. Later on, this person thought that he had confided with me in our discussions before knowing me quite well and that had been quite a cause of concern for him over the next few months. Accidentally, I established my ethnographic residence after a month closer to where this person lived. Then, physical proximity resulted in social nearness as well. And that was how this person revealed to me that he was quite concerned of our discussions. Fortunately, the time he told me his experience- yet another time for him to confide with me- he had already cleared off his fears and concerns. This accidental experience impinges on the issue of ethics about research carried out on human subjects. It suggests that no matter how we are prepared and are watchful of the question of ethicality in research, there still is a potential that we could be a cause of concern. The experience should not be one to question the due care and devotion in respecting the values and principles of research ethics, but to re-examine and explore the complexities of what we call research ethics.

Furthermore, the experiences of my research show that research ethics is also a culturally relative concept. Before my coming back to Ethiopia from the University of Alberta, in my research ethics proposal, I had to convince the Research Ethics Board that seeking written consent from informants in Ethiopia, especially when informants had to sign up, was not going to be a

help. My justification was accepted. When I got myself in the field among my informants and asked to get even their verbal consent to express their willingness to give me information, after explaining to them clearly the intentions and objectives of the research, not a few people were confused at what I was saying. That I was accepted as a researcher in their FA and its villages was considered to be sufficient to allow me access to interview and observe them. Thus, to ask each individual and groups for consent was an aberration, not comprehensible at all to the cultural schema of these people. There was confused silence and my informants gazed at each other over this question which I often asked at the start of the discussions I had in the beginning. In some instances, my assistant, Yïmam, intervened to re-explain what I was saying but he also made no difference.

2.4 A Few Words about the Author

I am Ethiopian and originally come from the same region as the study was undertaken. Though I was not born and brought up in this region, I speak as a mother tongue the Amharic language and have been familiar with the Amhara culture from early on, along with that of the Oromo. In such a research, the social structural setup of the researcher and the researched communities is to be different. All the same, as in the principles of ethnographic or participatory research, I had approached the people I studied on a par with me and had treated them as equals and partners rather than otherwise. As far as my experience with them goes, they had approached and worked with me with the same sense of respect and equality.

2.5 Constraints, Challenges and Opportunities

Among the difficulties I used to face during the initial period of fieldwork in my ethnographic and the surrounding villages was the rugged mountainous topography, which, coupled with the heavy summer rains of *kïrämït* 2007, rendered movement a bit difficult. I used to it soon, however. Once in the

ethnographic site, the questions, “how did you happen to be here?”; “how did you choose our Farmers Association and not others”, were among the frequently asked questions. In some cases, I had to provide detail explanations. Much time-taking though, it was quite helpful in getting my purpose clear to these people. In some cases, I took advantage of such individuals as naturally occurring informants. Nonetheless, during and after my reconnaissance visits and discussions I had in my ethnographic and the surrounding villages, the most persistent challenge was to prove how the study was going to positively affect their life. I was quite explicit and direct that the work was academic, with some expected contribution to policy but with no foreseeable action resulting from it anyways. My choice between “an active commitment to social reform” and “a passive observer of social processes” was brought to the test of the field. Experiencing it in practice was quite different from writing about it. In spite of this challenge, so was my response and the question was prolonged more than I expected. Finally, I believe, most of them have come to understand me. The approach of one of these farmers is quite remarkable. In a group discussion, he made certain from me that the government could ultimately find some ways to what will be the final result of the study. Then, he concluded, “In that case, this study is going to be useful to us”. Perhaps, this farmer had answered the question better than I did. Though remote, he had perfectly sensed the potential of a research as “an active commitment to social reform” rather than my guarded responses which probably gave the impression that it was one of a passive observation of social processes. As I shall be discussing it in this dissertation, there has been a growing tradition of dependency on external relief aid coming through government, UN agencies and NGOs. This has made many farmers focus on the here and now in their life. I have done my best to do away with the expectation that the study is not connected with any kind of envisaged assistance and I believe I was generally successful in this regard.

Transportation was a challenge and of course a constraint. Wärräbabbo is not found along the main highway that takes from the Ethiopian capital, Addis Ababa, through Dessie to Mekele and to Asmara, when this city was part of Ethiopia. The district seat, Bistima, is located to the right hand side of this highway as one travels to the north from Addis Ababa. Haik, the seat of Tähullädäre district is located 33 kms from Dessie, and flanking to the right, one has to travel for 17 kms, passing the low lying area adjacent to Lake Haik and driving up the long mountain, till one riches the small 125-year old town of Bistima. This is gravel, yet all-whether road ventured only by four-wheel drive vehicles carrying more than double their capacity. Past Bistima, the road is rougher and public transport more depriving. To the inexperienced observer, as I was in the beginning, it could be very surprising to see as many people as 100-120 on board medium-duty tucks in that rough, hilly and meandering rural road. Traveling by buses is a luxury if it were not only for getting stuffed and suffocated from overloaded passengers and goods. Those who drive beyond speed limit to the quality of the road and difficult topography perfectly add to the ordeal of a new traveler as I once was. Literally, I had to get off these vehicles two times and walk on foot in the middle of my journeys. One day, I had to wait for six hours before I got a truck to Bistima, in my homebound journey to Addis Ababa. Thanks to the hospitality of the people of the area, many people used to free up their spaces in the cabin for me.

Getting a maid is quite difficult in Gäddärro. Both young men and women migrated to towns within and out of the country to seek employment. All the same, it is generally a taboo for women to work as a maid within their communities. Because of this, I was forced to cook my own food. Cooking facilities were time-taking for a person like me who needed to spend ample time interacting and collecting data. There was little way out, however. Household chorus was quite a serious issue except that I had some assistance in fetching water, washing clothes and sometimes cleaning house. Of course,

getting helping hands in this regard, had lessened very much the difficulties I should have gone through. The room that I leaved in for the first month was quite small and in a rowdy area. This problem was short-lived. I was able to move to a new space with two rooms, partially plastered with mud and straw, but quite spacious and serene. Renting a space in this area, in most of the cases, also means fixing sanitary and washroom facilities. My landlord, Yïmam, who soon became my long-term field assistant and his brother, Adäffa, were so generous in taking this responsibility.

2.6 Conclusion

I want to conclude this chapter in a rather different way by paying tribute to my local exegetes in Gäddärro and saying a word on a research proposal. I have already said that the analysis of my work was started in the field. Apart from the analytic notes I was keeping in the field, my informants, especially, my key informants, were of paramount importance in analyzing the data they were delivering to me, sometimes even without my invitation towards this. An example of such local analysis is the one viewing the role of the state as mandatory in order to maintain law and order in resource use among co-villagers. Some openly stated that religion was to them what science was to who they considered "educated persons". My most prominent educator on local land tenure, Ahmäd Nuriyyé, was quite comparable with senior agrarian scholars when he explained and interpreted the feudal land tenure systems in Ethiopia and the path that was taken by the Military Junta which toppled the regime of Emperor Haile Sellassie I in 1974.

My research assistant, friend, mentor and great educator, Yïmam Mohamed, was of tremendous value in facilitating and organizing interview and observation sessions, their smooth and effective start and finalization and of course, when necessary, their correction before things went astray. He was so important in putting to ground the research techniques I mentioned in a proposal. The role of the ethnographer is not only that of "facilitating", so that

informants could speak in their own terms. It is also one of letting field assistants be co-researchers or partners or collaborators in true sense of these terms. When Yïmam operated my digital camera and the tape recorder efficiently, this was the impression that villagers had as they stated it openly. Therefore, my informants, especially my key informants, had inerasable and irreducible trace both on the methodological, analytical and interpretive aspects of this dissertation, from the start of data collection through the completion of the write-up. My key informants and many others made thoughtful and interesting explanations and interpretations. I put them on paper. Therefore, the term "informants", even though I have employed it repeatedly, lacks the sense of gratitude and acknowledgement such individuals deserve. My use of it in this dissertation is to be seen in line with this recognition.

There are anthropologists who advise their students to take to the field without any preconceived idea. Then, the right agenda for the research will crop up during the course of fieldwork. Even though I subscribe to this notion, proposal in anthropology is an on-going and unfolding process, more close to the naturalists' view of research than to the positivists'. Nonetheless, the experience I have undergone in this research reveals that proposals conceived prior to fieldwork could still be generally valid. This validity, of course, seems to be conditional. If it were not for my lifelong experience of the Ethiopian context, which was enriched through readings and reflections of the Ethiopian and Wello environments, especially the drought and the famine experiences, would my preconceived proposal be as valid? My response is no. There is difference between studying one's 'own' country and others' culture (any setting) one has not been exposed to before. Finally, I want to stress that my proposal did only serve as a flexible guide to look for what, and not to determine how the things I looked for were to be unfolding.

CHAPTER THREE: THEORIES AND CONCEPTS

3.1 Introduction

Despite some excellent descriptions and generalizations made about agrarian societies in Ethiopia, most of the studies on human-environment relations are amiss in conceptual and theoretical orientation (Dessalegn, 1991). Commenting on this limitation, he further wrote, "Studies of rural production in Ethiopia have often been conducted outside general theoretical frameworks, and the result has been a plethora of empirical-technical reports and documents, and a dearth of theoretical and conceptual-oriented works" (Dessalegn, 1991, p. 69). Dessalegn acknowledges that though many have shunned away from theory, some of the more recent researchers have produced high quality case-study literature. Referring to his critique, he reflects and gives us a sense of purpose: "We are only pointing to a neglected field, and suggesting at the same time that researchers, especially academic researchers, should attempt to redress the balance" (Dessalegn 1991, p. 69). This critique applies equally to social/cultural anthropological works carried out in the country. Therefore, my research had to depend on broader theoretical frameworks of human-environment relations.

Many scholars have noted at different times that ecological anthropology has followed two different theoretical perspectives: one emphasizing the material aspect of the subject and the other, the mentalist aspect of it (Hornborg, 1996; Ingold, 2000; Milton, 1996; Susan and Nuttall, 2009; Peterson and Broad, 2009; Strauss and Orlove, 2003). What is more, since the anthropogeography of the early 20th century, there has been a debate revolving around which prevailed over which- culture or the environment- in sociocultural transformation? The recent period in anthropology has rather turned the course of this debate into an interactive and processual framework whereby both culture and nature affected each other (Collignon, 2006). The nature-culture dichotomy itself has been criticized as irrelevant (e.g. Ingold, 2000).

This emergent interactive and processual theoretical perspective, termed by some as "the new ecological anthropology" (e.g. Kottak, 2006), involves different aspects of human society in ecological analysis. It appreciates the complex nature and interplay of human society with respect to social, economic, political, historical and ecological factors (Balee, 1998; Collignon, 2006; Crumley, 1994; Ingold, 2000; Kottak, 2006; Susan and Nuttall, 2009) which were reflected in different theoretical approaches.

In spite of their similarities, all of the different schools of thought exist as if they are significantly removed from one another. I am not arguing that the theories do not serve by themselves. My emphasis is that their coordinated application enables the acquisition of more reliable and comprehensive knowledge about the interaction of humans with the rest of nature. The wholeness of this approach is also in line with anthropology as a holistic study of the different aspects of the human condition. In the following sub-sections, each of the theoretical perspectives, including the culture theory and the conception of resources, their use and degradation, are reviewed. A unified theoretical perspective of the different ecological anthropological theories is practiced in the analysis of this dissertation.

3.2 The Beginning of Interest on Human Relations to Their Environments

It was imperative for "primitive man" to have good knowledge of his environment to survive, to locate and collect roots, fruits and berries, and to hunt animals (Odum, 1971, p. 3). The relations of humans to their environments has been a subject of scholarly interest since ancient Greek (e.g. Aristotle, Theophrastus) and Roman philosophers attempted to understand the basis of human nature[36] (Babe, 2006; Netting, 1977). Babe

[36] Aristotle said, "the inhabitants of the colder countries of Europe are brave, but deficient in thought and technical skill, and as a consequence of this they remain free longer than others, but are wanting in political organization and unable to rule their neighbors" (as cited in Netting 1977, pp. 2-3). Montesquieu correlated warm climate with timidity and weakness, among others. The anthropogeographer Ratzel noted civilization was stimulated by the

mentioned Worster as pointing out that the English pastor and naturalist, Gilbert White, inaugurated the modern understanding of ecology in his 18th century book *The Natural History of Selborne* (Babe 2006, p. 38). In his quest to understand the divine foundations of nature, White came to a notion of ecology somehow akin to what is currently understood. Babe wrote of White, "He saw divine planning everywhere, resulting in a harmony among the species. His was a holistic, organic view of nature, where individual organisms interact to form a *biotic community*[37] [emphasis is Babe's]" (Babe, 2006, p. 38). Carolus Linnaeus is also remembered as the second pioneering figure of ecology from the same century as White. He gave a detailed classification of all species, one that is still used today; introduced the notions of hierarchy and balance in nature, though unlike White, he saw nature as composed of mechanistic parts and something created for the sake of man (Babe 2006, p. 38). In the mid-19th century, Charles Darwin proposed another model of ecology that focused on competition and the struggle for existence, which was later re-coined by the evolutionist Spencer as 'survival of the fittest'. Darwin's model, which saw life as being full of struggle and antagonism, was also anthropocentric.[38] Babe remarked, "The Darwinian model supported the notion that people 'in nature' are 'primitive' and 'inferior', and that to be detached from or 'above' nature is not only superior but is the only way of constructing a moral universe" (2006, p. 43).

Archeological evidence has it that humans' interaction with their environment dates back to the early Pleistocene (Hamilton, 1982). Steward (1955) surmised that this interaction would have more influence than genetics in the transformation of a hominid into *Homo sapiens,* probably completed some 100,000 - 150,000 years ago. The scale of human exploitation of the

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destruction of "strong winds and great storms" (as cited in Netting, 1977, pp. 2-3). The research communities associate climate with human behaviors.

[37] White's proposition could be regarded as one of the roots to the current ecocentric rather than anthropocentric attitudes to nature.

[38] This notion, links to the current environmental philosophy that rests on anthropocentricism in the management of resources and human- environment relations in general.

environment, however, remained at a lower level for the most part of human history on earth- where our ancestors lived as hunters and gatherers (Russell, 1997). Technological development and innovations such as the invention of fire; the domestication of plants and animals (some 6-10,000 years ago); the beginning of sedentary life; the creation of surplus produce and the formation of states[39] constantly raised humans' capacity in exploiting nature (Russell 1997, Crumley 1994, Marsh 1885, as cited in Balee, 1998, p. 17). In this regard, the invention of metals and metal-based technologies were of significant breakthrough. No human invention and ingenuity as the scientific and technological innovation and intensification of the last three hundred years, has, however, been comparable in terms of intensively using, modifying, changing and, also in many respects, profusely abusing the natural environment. It was within this period, towards the end of the nineteenth century, that anthropology started to grow as an independent discipline. The roots of anthropology's interest in human-environment interaction date back to this early period.

Some of the ideas of these and other earlier scholars are still the background for current academic thinking and practice. Better understanding of the groundwork of nature; achieving harmony among its different components; treating these components as holistic and organic; the distinction between ecocentric and anthropocentric sentiments; competition for survival and the effect of scientific and technological progresses are further extensions of these earlier thoughts. As shall be presented in the following sections, the different

[39] States have a role in the management of local environments in order to increase their economic and political powers in the face of the land and the people they administered has been thought to exist since the ancient times (Walker, 1989, as cited in Bryant and Bailey, 1997, p. 52). The rise of the modern state in Europe in the seventeenth century is said to have boosted the state into assuming a leading role in this regard (Hall, 1986, as cited in Bryant and Bailey, 1997, p. 52). I would add, since the second half of the 20th century, transnational corporations, in addition to the institution of the state, have emerged as dominant leads in the management and exploitation of the natural resources and the people inhabiting the globe. The coming to Ethiopia of such companies and Arab states to lease massive agricultural land currently is interpreted as such by those opposed to government decision in favor of this scheme to attract foreign investment.

ecological anthropological theories and concepts are linked to this background.

3.3 The Rise of the Ecological Approach in Anthropology

The ecological approach has affected all the sub-fields of anthropology. The concept of ecology was introduced into anthropology from biology in the 1950's. The term was derived from the Greek word *oikos* which meant "habitation" or "house" or "place to live" (Bates, 2006; Odum, 1971; Netting, 1977). Based on this, Bates wrote "ecology is the study of the home or dwelling" (2006, p. 34). For the German zoologist, Ernest Haeckel, who coined the term *oekologie* in 1866, and, whose English print version (ecology) appeared in 1873, 'home' was the entire realm of nature (Odum, 1971). He defined ecology as "the study of the economy, of the household, of animals with both the inorganic and organic environments" (as cited in Babe 2006: 34). The biological ecologist, Eugene Odum, wrote, "Usually it [ecology] is defined as the study of the relation of organisms or groups of organisms to their environment, or the science of the interrelations between living organisms and their environment" (Odum, 1971, p. 3). The renowned Canadian environmentalist, David Suzuki, has given a broader definition of ecology as the study "of the often invisible and mysterious web of relationships [or "pathways"] that connect living things to one another and to their surroundings" (as cited in Babe 1997, p. 34). Suzuki elaborated that organisms are connected to 'the web of existence' by means of three pathways: energy pathways (or food chain); flow of matter pathways; and communicatory pathways (as cited in Babe 2006, pp. 34-5). Energy pathways refer to the conversion into energy of sunlight through photosynthesis and the transfer of this into other organisms when plants are eaten. This is linear. The second pathways re-circulate 'life-sustaining substances'- carbon, oxygen, nitrogen, phosphors and others. The communicatory aspects refer to symbols

that people attach to the forms, shapes and patterns energy and matter take (as cited in Babe, 2006, pp. 34-5).

Basically, these definitions of ecology focused on the concept of the ecosystem (from biology) which was characterized by several interrelated concepts such as niche, climax, food web, energy flow, and trophic level. In the face of this acknowledgement to biology and the physical sciences, Winterhalder (1994, p. 30) argued that the ecosystem concept is a "curiously *social* [emphasis in original] construct…influenced by the social evolutionary theories of Spencer". Moran (1990, p. 3) sees the ecosystem connectedness in terms of 'structural and functional relationships' between living organisms and their environments. For Crumley, too, ecology is "the relationships among living organisms or between them and the physical environment" (1994, p. 3). The holism of the ecosystem approach, as in the definition given by Suzuki, was in harmony with anthropology's view of culture as an integrated whole. This, in turn, attracted many anthropologists to apply the concept to the understanding of culture and its evolution in the beginning of the 1960s. The introduction of the concept into anthropology, thus, was greeted with enthusiasm. Even though the ecosystem approach has been out of academic vogue, a number of its traces are found in current ecological thoughts.

Fundamentally, the move to the ecological concept was accompanied by some dissatisfaction with earlier anthropological theories of cultural types, cultural forms and sociocultural change (Netting, 1997). These included the environmental deterministic explanations of the late 19th and the earlier decades of the 20th centuries (Moran, 1990); the overemphasis on the concept of culture (Moran, 1990); and the dissatisfaction over the structuralist interpretations of sociocultural change (Netting, 1986). Over the years, different paradigms or approaches and methods within the 'grand approach' of ecological anthropology were to be espoused and put into practice. Currently, the ecological approach is at the heart of environmentalism and

anthropology's contribution to the sustenance of human-kind and nature. Considered in this respect are such problems as resource degradation, species extinction and global warming. Against the backdrop of this historical context, different schools of thought or theoretical perspectives in ecology are applied in the anthropological analysis of human-environment relations. The anthropological current in the environmental vein was strongly stated by Philippe Descola and Gíslíi Pálsson when they wrote, "Anthropology can no longer restrict itself to the conventional social analysis of its beginning; it must rethink its domains and its tools to embrace not only the world of *anthropos* [emphasis in original], but also that of the world with which humans interact" (1996, p. 4). The anthropological practice in this research is among the studies to be placed within this broader academic current.

3.4 Theories and Concepts in Ecological Anthropology

On the relevance of anthropology to current local and global environmental issues, Kay Milton focuses on what social and cultural anthropology could offer. Though she is aware that this could make the discipline look inwardly, her focus has remained on what the social and cultural theories and concepts peculiar to anthropology could serve to the advancement of environmental debates and common understanding. Nelson has emphasized the role of culture (cultural construction) in human-environment relations to the disregard of sensual perception (as cited in Ingold 2000). On the other hand, Ingold, among others, has given priority to what he calls active, perpetual engagement with the environment as a determining factor in humans' relationship to their environment.

Elisabeth Croll and David Parkin consider the "issues, choices and problems" of the natural environment as "popular, political and academic issues of worldwide import", increasing over the years the interest and contribution of anthropologists "to our understanding of environment and development issues" (1992, p. 4). They underlined that anthropology could study the

impact of the "cultural imagination" (p. 4) of people, which, through their 'beliefs', 'perceptions' and 'myths', impact on the utilization of their natural resources though the anthropological perspective, at first sight, might not appear to be addressing these issues. Further writing about this, they said,

> These are approached, as it were, from the shadows: through ritual, beliefs in spirits and holy sites, ideas of human birth and regeneration, the common origins of mankind and animals, the consubstantiality of human and plant life, the characterization of 'natural' hazards as the wages of sin or the work of malicious non-human forces, or of rain and fertility as the reward of just behaviour or divine beneficence". (Croll and Parkin, 1992, 4)

By this, they do not mean that anthropologists are not concerned "with technical or ecological issues". In addition to these concerns, anthropologists study how humans construct knowledge about their cultural and bio-physical environment, including the political factors that influence their relations to these environments and the feedback of the environment itself both at local and higher levels of analyses. As stated in Chapter One, these aspects are to be well considered in this dissertation, focusing on local environments in relation to the larger pictures.

Socio-cultural ecological anthropologists could be put along this Nelson-Ingold continuum. My study is not about cultural or environmental determinism. It is about culture in nature and nature in culture. In order to accomplish this task, my perspective falls along what I have preferred to term the Nelson-Ingold continuum. The study draws to one or the other as deemed necessary by the call of my data. With this in mind, the major ecological perspectives are reviewed below so that aspects relevant for the theoretical analysis of my research are synthesized.

3.4.1 Sociocultural Theories

According to the theory of culture, our understanding of the external world is shaped by our meanings, feelings, thoughts and knowledge (Flint and Morphy, 2000; Milton, 1994; Sahlins, 1976; Rappaport, 1969). Or, if not

shaped by culture, it is at least interpreted by it. The strongest version of this is expressed in Nelson's statement: "Reality is not the world as it is perceived directly by the senses; reality is the world as it is perceived by the *mind* through the medium of sense. Thus reality in nature is not just what we see but what we have *learned* to see [emphases in original]". (Nelson, as cited in Ingold, 2000, p. 55) In environmental analysis, Cannon further wrote, "in effect the environment is itself a social construction" (1994, p. 14). Maturana and Verela (1987, p. 234) underlined the importance of language- an aspect of culture- in humans' cognition, as saying, "it is by languaging that the act of knowing…brings forth a world" (as cited in Hornborg 1996: 52). For Hornborg, "ecological relations are based on meaning; they are semiotic. Ecosystems, no less than cultures, are contingent upon communication" (Hornborg, 1996, p. 53). Milton (1993, p. 2) views environmentalism as "culturally defined responsibilities" and accords importance to sociocultural anthropology in the global environmental analysis. For Marshall Sahlins, "Nature is to culture" "as the constituted is to the constituting" (1976, p. 209) meaning that culture constitutes nature. Unlike Ingold, for Sahlins (1976, p. 210), nature is there "waiting to be given meaningful shape and content by the mind of man". The shift in the cultural valuation of resources such as soil among the research communities depicts the importance of culture in a similar manner.

The environment could affect social relations such as kinship relations, class relations, technical relations and relations of production (Ellen, 1982; Milton, 1993; Susan and Nuttall, 2009). Not only humans' material impact on the environment brings nature "within the realm of cultural representations" but environmental responses are also largely "mediated by the structure of social relations" (Ellen, 1982, p. 62). Social and cultural forms developed in response (or in failure to response) to an environmental factor could further instigate changes in the social and cultural system. According to Ellen, "Specific adaptations- say, the use of a plough to work heavy ground- not only

have social repercussions for the organization of labour, but give rise to a new environmental condition to which the population must again adapt" (1982, p. 261).

The material, the social, the cultural, the ecological and the biological are interrelated (e.g. Ellen, 1982; Turner, 1985). In such an *"inter*systemic*"* rather than simply systemic (Turner, 1985) analysis, "culture has to be seen as processual because it emerges in interaction and imposes meaning on the biotic and ecological systems (also dynamic) with which it interacts" (Ellen 1982, pp. 153-4). Individuals networked in social relations negotiate assigning meanings to their acts that are also reflected in their ecological behaviors (Ellen, 1982). He further said that the assignment of these meanings should be seen as a process, as people adjust and readjust to the 'strains' and 'tensions' of the biotic and the social environment (Ellen, 1982).

Further to this, in the process of negotiation and re-negotiation, these meanings could be maintained or retained, modified or subverted as persons act to fulfill their purposes and goals in life (Turner, 1985; Moore and Myerhoff, 1977; Schultz, 1967). The retreat of the Greenland ice sheet has been differently interpreted by the Home Rule Government and local Inuit communities (Susan and Nuttall, 2009). Symbols (whether ritual, social, or political) are inherently social, public or collective (Turner, 1985). Their multivalence allows the public to change their meanings as in by adding new signifieds to old signifiers (Turner, 1985). Moreover, individuals or "semantic manipulators" could impute their meanings or interpretations into existing symbols to be picked by the public contingent on their (the former's) influence (power, authority, prestige, legitimacy) (Turner, 1985). Where thought tallies with action this feature of symbolization could allow individuals and institutions to manipulate collective consciousness and behavior, for better or worse (Turner, 1985). This symbolic dynamics is employed as one theoretical strand in this research, especially in cases the

same resources such as land are understood as scarce and abundant at the same time.

The role of religion in human-environment relations is an important aspect of culture. For instance, farmers in Gäddärro are not always free from the influence of superhuman entities, such as deities, in the management of their knowledge. The farmer who knows that the maize seeds he plants on ground shall fertilize, grow into a plant, blossom and bear real fruits, does not rely on these bio-agronomic factors alone to reap harvest. Supplication to God and sacrificial gifts to ancestral spirits, are corollary to the very practice of farming. Thus, success or failure in farming is not explained in technical terms *per se*, but also in spiritual terms.[40] According to Sullivan, "We will understand ecology better when we understand the religions that form the rich soil of memory and practice, belief and relationships where life on earth is rooted (2001, p. xiii). He added, "Knowledge of these views will help us reappraise our ways and reorient ourselves toward the sources and resources of life" (2001, p. xiii). In a series foreword to the book Indigenous Transitions and Ecology, Mary Evelyn Tucker and John Grim, in view of the enormous environmental problems the world is faced with, wrote:

> For many people an environmental crisis of this complexity and scope is not only the result of certain economic, political, and social factors. It is also a moral and spiritual crisis which, in order to be addressed, will require broader philosophical and religious understandings of ourselves as creatures of nature, embedded in life cycles and dependent on ecosystems. Religions, thus, need to be reexamined in light of the current environmental crisis. This is because religions help to shape our attitudes toward nature in both conscious and unconscious ways. (2001, p. xvi)

Religion is employed as a way of understanding the foundation of nature. This role of religion is more pronounced in traditional societies such as Gäddärro

[40] In a small research project I carried out in central Ethiopia (2003) to integrate a safe motherhood component into a family planning project, I have found that for some households the patron spirit called *amäččisa,* held in the person of a living elderly, has to grant permission for pregnant women to seek maternal services in health facilities and for newborns to be vaccinated. This belief and its ensuing practice exist in spite of community members' overall acceptance of modern medication.

compared to western societies. Notwithstanding the gap between religious percepts and practices, still religion serves as a way of interpreting and understanding such issues as the evolution of earth and humanity. In this regard, Tucker and Grim, further said,

> Religions provide basic interpretive stories of who we are, what nature is, where we have come from, and where we are going. This comprises a worldview of a society. Religions also suggest how we should treat other humans and how we should relate to nature. These values make up the ethical orientation of a society. Religions thus generate worldviews and ethics which underlie fundamental attitudes and values of different cultures and societies. (2001, p. xvi)

As already noted, Tucker and Grim recognize the gap between theories and practices in religion. For them, even those religions that appear sympathetic and caring for the environment have contributed to resource misuse. Their position, however, does not devalue the role of religion in the protection and sustenance of the environment (endangered ecosystems, threatened species and diminishing resources) even though they stated that Western Abrahamic traditions of Judaism, Christianity, and Islam hold humans above nature contributing to the misuse of the environment. In this regard, they remarked, "While it is clear that religions may have some disjunction between the ideal and the real, this should not lessen our endeavor to identify resources from within the world's religions for a more ecologically sound cosmology and environmentally supportive ethics (Tucker and Grim 2001, p. xx). They added, "This disjunction of theory and practice is present within all philosophies and religions and is frequently the source of disillusionment, skepticism, and cynicism" (Tucker and Grim, 2001, p. xx). In addition to their constraining aspects, these writers noted that religions of the world have environmentally transformative and conservative qualities. They also hold that their "various tensions and limits" in this regard need to be seen as leverage rather than a source of hopelessness. They further wrote, "To recognize these various tensions and limits, however, is not to lessen the urgency of the overall goals of this research. Rather, it is to circumscribe our efforts with *healthy skepticism*, *cautious optimism*, and *modest ambitions*" (emphasis

added) (Tucker and Grim, 2001, pp. xx-xxi). The cultural understandings of rain, trees, soils and other agrarian resources found in the natural environment are replete with such religious understandings of nature among my research communities. The discrepancy between percept and practice in this regard is also revealed, rendering this theory quite useful in their analyses. In a similar manner, "'cultural goals', situated within systems of belief and meaning" are understood as part of the reasons for the mismatch between the ideal model of resource use and their actual management (Winterhalder 1981b, p. 16, as cited in Ingold, 2000, p. 31).

3.4.2 Skill and the Environment

Ingold's perspective in ecological anthropology holds that environmental knowledge and understanding "rests in perceptual skills that emerge, for each and every being, through a process of development in a historically specific environment" (2000, p. 25). He places emphasis on the direct experience of individuals as they are actively engaged with the different components of their environment to be the source of one's skills to perceive the environment rather than *a priori* conceptions coming from outside the environment (Ingold, 2000). He described this as "ongoing and mutually constitutive engagement between people and their environment" (2000, p. 27). Therefore, Ingold criticized the cultural constructionist theory that our understanding of the environment is shaped by our feelings, thoughts and knowledge, in short culture. In his critique of those who employ the cultural construction theory, specifically Nelson, he proceeds,

> Knowledge of the world is gained by moving about in it, exploring it, attending to it, ever alert to the signs by which it is revealed. Learning to see, then, is a matter not of acquiring schemata for mentally *constructing* the environment but acquiring the skills for direct perceptual *engagement* [emphases in original] with its constituents, human and non-human, animate and inanimate. …, it is a process not of enculturation but of enskilment. (Ingold, 2000, p. 55)

For Ingold, information lies in the world and not in the mind. Taking hunter-gatherer societies as an example, he argues that a hunter's knowledge is

enacted "in the relational context of the hunter's engagement with the constituents of that world" (2000, p. 55-6) which, according to him, a western observer lacks. It is interesting to note his powerful argument that "New knowledge comes from creative acts of discovery rather than imagining, from attending more closely to the environment rather than reassembling one's picture of it along new conceptual lines" (Ingold, 2000, pp. 55-6). For him, meanings are 'picked up' from the environment rather than 'pinned on' it.[41] And he argues that humans' *interaction in nature* and their *construction of nature* are all the same and not to be differentiated as material and magico-religious engagement with nature. The influence of the bio-physical environment on how people moved, produced, interacted and lived within their communities in the broader ecological perspective of a nation, region or the globe at large, has been recognized by other writers as well (e.g. Collignon, 2006; Nuttall, 2009) who also accepted the influence of contacts among people and power relations among countries. Nonetheless, Ingold denies the importance of these cultural interactions in his enskilment approach or sentient ecology to affect people's perception of the environment or he simply considers them not to be different. He thus reduces cultural notions, principles and values to sets of skills which individuals develop in their direct interaction with the environment and not to be derived from their prior enculturation. The concept of enskilment itself could be argued to be part of enculturation as in practically training the young. I use his theory just partially in this research.

Ingold has also written about the conceptualization of traditional knowledge which he says has taken two ways: what he calls traditional knowledge in modernist conception and traditional knowledge in local conception (Ingold 2004, p. 306). According to him, the first conception, which he also calls the

[41] Similarly, in an earlier writing he said, "the structures and meanings that we find in the world are *already there* [emphasis is Ingold's] in the information that we extract in the act of perception; their source lies in the objects we perceive, they are not added on by the perceiver (Ingold, 1992, p. 46)".

"genealogical model", is "based on the idea that the elements of that go together to constitute a person are *passed down* [emphasis in original], along one or several lines of descent, from that person's ancestors, independently and in advance of his or her life on the land, in an environment" (Ingold 2004, p. 307). He argues that this approach disregards the importance of experiential, sentimental and emotional attachment to the land that is necessary for the application of TEK. On the contrary, in the second conception, he underscores, it is not conceived as passing down from generation to generation. He holds, "Rather, it is continually generated and regenerated within the context of people's skilled, practical involvement with significant components of the environment" (Ingold, 2004, p. 307). In this view, the traditional person should maintain direct physical attachment to the land because it is through such interaction that his environmental knowledge is basically created, used, shaped and reshaped. These lines of analyses are helpful to understand the discourse on land shortage and the dissociation of the younger generations of the Gäddärro communities from farming practices primarily because of school attendance and out migration.

What Ingold has termed 'enskilment' is also described by other writers as 'practical enskilment', understood as "the collective product of a community of practice" serving as the "source of extensive knowledge of the ecosystem" (Pálsson, 1994; Pálsson and Helgason 1998, as cited in Pálsson, 2006, p. 80). Based on the experience of Icelandic skippers, Pálsson said, "Usually their [skippers'] accounts emphasize constant experimentation in the flux and momentum of fishing, the role of perpetual engagement, and the importance of hunches, intuition, and tacit knowledge. Somewhat ironically, the skippers' approach is much closer to the postmodernist paradigm than is the approach of marine biologists". (Pálsson, 2006, p. 80) This knowledge is comparable with what smallholders of Gäddärro call *măğärräb,* which could be defined as experiential or judgmental understanding, also with some implication of intuition. Ingold's direct perceptual engagement is comparable to Pálsson's

"situated learning". While mentioning competition, secrecy, independence and modesty as reasons for skippers' state of not talking about their tactics, Pálsson added "they have difficulty verbalizing their complex experience and intuition" (2006, p. 81). States of fishers described by them as "hunches" and "fishing mood" are mentioned by this writer as particularly difficult for them to articulate in words so that some important decisions are reached "out of the blue". His empirical generalization, as that of Ingold, detracts from the relevance of culture or *a priori* knowledge in environmental interaction. Based on the same ethnography, Pálsson adds the following about his idea of "situated learning", "Decision making, then, is based less on detached calculation or mental reflection than on practical involvement. Similarly, the process of enskilment is not just a cognitive one; rather, it involves the whole person interacting with the environment" (Pálsson, 2006, pp. 80-81). He maintains that "The education of skippers recognizes the importance of situated learning" (Pálsson, 2006, p. 81).

The theoretical perspective of Ingold (2000) and Pálsson (2006) is relevant to structure and analyze my ethnographic data (on environmental perception and cultural understanding) from two important vantage points. One is what I regard as the strength of their theory in that they questioned the cultural construction theory of the environment. Second is what I regard as a weakness of their theory for their excessive reliance on enskilment or situated learning. Taking their emphasis on direct engagement with the environment as a clue, I shall show the importance of enskilment in the form of the application of acceptable agricultural resources, technologies and innovations. Secondly, I will demonstrate how the cultural schemata Ingold is so much worried about as a mere imputation of meaning on otherwise actively experienced environment is not always a well placed argument. His disregard to *a priory* knowledge and imagination is similarly less defensible in certain circumstances. Therefore, such statements in his theoretical expression as "New knowledge comes from creative acts of discovery rather than

imagining, from attending more closely to the environment rather than reassembling one's picture of it along new conceptual lines" (2000, pp. 55-6) should be regarded as partially but essentially useful in the analysis of human-environment relations.

Pálsson's situated learning, apart from showing the relevance of experience as per his intentions, might also be applied to challenge it in favour of the role of culture or *a priori* experience. There is an old adage in Amharic: "He who has seen a snake during daylight will run away at the sight of a rope at night". Accordingly, situated learning is not just about the immediate present or the here and now. It is also about the past-about the there and then. Nonetheless, I also argue that cultural schemata, though important, is not always a fixed blue print not immutable to new thoughts and practices. I shall show this, among others, by relying on data relating to the diffusion, multiplication, up-take and gradual decline of agricultural technologies and innovations. The most important contribution of Ingold and Pálsson, as I understand, lies in their position that our cultural understandings or enculturation do not always guarantee us reliable knowledge and skills to deal with the environment adequately. In such circumstances, Ingold's enskilment and Pálsson's situated learning prevail. The world that students of ecological anthropology explore is made up of both of these circumstances- enculturation and enskilment. I have therefore adopted both of these theories as complementary and supplementary rather than contradictory.

3.4.3 Historical Ecology

According to Balee, "historical ecology begins with the premise that historical, not evolutionary, events are responsible for the principal changes in relationships between human societies and their immediate environments" (1998, p. 13). For Balee, historical ecology, also called landscape ecology, is a point of view, a field and a method with its own postulates. It is also interested in interpretation: "Historical ecology focuses on the interpretation of culture

and the environment rather than on the adaptation *of* human beings *to* the environment [emphasis in original]" (1998, p. 14).

One of its postulates has it that humans have affected much of the biosphere throughout history (Balee, 1998, p. 16). Other historical ecologists (Crumley, 1994; Crumley and Marquardt, 1990, cited in Balee, 1998) consider the physical environment to be a product of culture and historical factors that determine it (as cited in Balee, 1998, pp. 15-6). The depleted vegetation cover of Ethiopia reflects this postulate. From what is said here, one might call its approach one of historical determinism. Nonetheless, we need to be careful of what is meant by historical. Events such as war and drought[42], replete in the history of Ethiopia, are historical. In societies where warfare is used as a means of social and environmental regulator (e.g. Rappaport, 1969) this might become more so. As a result of this, it might not be straightforward to characterize historical ecology. Historical ecology also postulates that humans do not necessarily destroy the environment as they do not necessarily render it more habitable (Balee, 1998, p. 19). Actually, these writers mention instances where humans have increased the biodiversity of the environment rather than decrease it. It also assumes that societies, their cultures and their immediate biosphere, which they interact with spatially and temporally, can be grasped as 'total phenomena' (Balee, 1998, p. 24). Within this totality, people and nature interact, as "people project culture onto nature" (Crumley and Marquardt 1990, p. 73, as cited in Balee 1998, p. 21). According to Balee, this frequently happens unconsciously (Balee, 1998, p. 22). The management of plants on graveyards among the research communities could be compared to this theoretical proposition. Historical ecology also assumes that different sociopolitical conditions affect a given environment and its biodiversity and the status of its abiotic environment in qualitatively different ways, including the ways how social, political and economic conditions evolve (Balee, 1998,

[42] Drought can be natural, human-made or both depending on the interpretation employed.

p. 22). The land tenure history of Ethiopia and that of the research localities are suitable to be analyzed in light of this perspective.

Historical ecology's basic objective is to find "analytical room to history" (Crumley, 1994, p. 30) in ecological anthropology. The ecosystem concept that sees ecosystems as an organism and a balanced functional system changing primarily because of extraneous factors is not acceptable to historical ecology (Winterhalder 1994, p. 29). Historical ecology emphasizes system history and internal causes within systems themselves as to effect changes in the system. It, therefore, gives a historical and integrative dimension to the different ecological approaches in anthropology for a comprehensive understanding of environmental problems at different scales (Crumley 1994, p. 4). Historical ecology underscores that the study of humans' impacts on ecosystems should consider the specific time, space and culture. The analyses of time, space and culture at different scales is one of the major approaches of this research.

Studies of traditional societies have to depend on oral histories and fewer written and visual documents. In this regard, the time depth the approach is insisting on depends on prehistory, archeology and computer modeling and simulation. Whitehead (1998) has given a further critique that it is difficult to grasp the history of ecologies which is very complex. This limitation in a way has also been acknowledged by Winterhalder, a historical ecologist himself, as he said,

> We place certain limit to our confidence in prediction, whether it is based on theory, empirical generalization, simulation or analogy….Their [the function of complex human-ecological systems] specific histories which may be only partially known to us, contain implications for their future development. All of this reduces our certainty about how these natural and anthropogenic ecosystems will function, especially when exposed to stress. History compels us to allow for the unexpected." (1994, p. 36)

In this research, the concept of uncertainty is emphasized and seen in relation to sustainable use of natural resources. The necessity of focusing on past

human actions in order to study current human behaviours with respect to the environment, its due recognition for TEK and its interactive approach render historical ecology a relevant perspective to this study. Of course, the strength of the theory is its focus on history. Nonetheless, what is historical is primarily social, economic, political or ecological. While historical ecology recognizes these factors and their impacts and implications on the relations of humans to their environments, it needs to be supported by other theoretical perspectives that largely deal with these aspects. Its focus on TEK has to seize ethnoecology and later conceptual tools on this subject. Its emphasis on socioeconomic factors needs the help of cultural theories to be realized. Politics has always been at the center stage of environmental resource use or misuse. This shall not be fully grasped without the analyses of the dynamics of power, authority and class relations. This further necessitates the use of political ecology in its analysis. Its focus on *interpretation* is worthwhile but its neglect for *adaptation* runs against its own merit that changes result from both internal and external factors. The need to render it more relevant to this research still necessitates a new perspective. This has to do with Ingold's "direct perceptual engagement with the environment" or Pálsson's "situated learning".

3.4.4 Political Ecology

Also known as the 'new ecological anthropology', political ecology is distinct for its interactive aspects, including a focus on political awareness and policy concerns. Anthropologists promoting this approach have been concerned with the distraction taking place and the threats posed on the environment and its resources from the local to the global level. Such concerns include commercial logging, environmental pollution, global warming, species extinction, environmental racism and classism, ecocide and the imposition of locally unsound management systems and practices. These are mostly done in the name of community development and extraction of market profits. This is

also because science and technology's capacity has become increasingly confronted with environmental and resource depletion problems (Kottak, 2006; Nazarea, 2003). Political ecologists also take account of trans-social and trans-cultural flows of peoples, information, technology and ways of thinking and doing. The migration of the younger generations in the research communities and in Ethiopia at large to the Middle East Arab countries and the importation of agricultural technologies from the rest of the world are treated in light of this theory in this dissertation. In the face of this inter-connection, it is hardly possible for a group to maintain distinct, culturally adaptive mechanisms. In this process, age-old adaptive TEK and practices have been destroyed, changed or modified. On the whole, political ecology is understood as traditional political economy (which focused on capital and the state) plus a focus on nature in the analysis of human-environment interaction. Focus on human institutions and actions and the ways they used and shaped nature as they labored ("constructed", "transformed" and "managed") to form a "harmonized" nature, is the major thrust of political ecology in comparison to cultural ecology (Greenberg, 2006, p. 126). Greenberg added, "It [political ecology] simply examines how real political and economic systems interact with nature through time" (Greenberg, 2006, p. 126). Biersack maintains power relations mediate human-environment relations (Biersack, 2006).

According to Kottak, the shift to this politicized, interactive and multi-level approach in ecological anthropology is a reflection of the general changes in anthropology from viewing communities as separate entities to one interconnected and interlinked to external communities and social, cultural and economic processes (2006, p. 42). The postmodern world has affected distant communities not reached before, including the communities of this research. In this process, there have been exchanges, exploitation, assimilation, domination and various, often unbalanced, relations resulting from differential power and status of societies, states and their entities. On this broader perspective, Kottak has to say:

> In the new ecological anthropology, everything is on a larger scale. The focus is no longer mainly the local ecosystem. The "outsiders" who impinge on local and regional ecosystems become key players in the analysis, as contact with external agents and agencies (for example, migrants, refugees, warriors, tourists, developers) has become commonplace. Ecological anthropologists must pay attention to the external organizations and forces (for example, government, NGOs, businesses) now laying claim to local and regional ecosystems throughout the world. Even in remote places, ecosystem management now involves multiple levels. (Kottak, 2006, p. 42)

The focus of the new ecological anthropology is on "people and their lives" (Kottak 2006, p. 48), combining ethnographic fieldwork and closer scientific site investigation with satellite imageries to capture 'ecological hotspots'; GIS to gather baseline data for comparative analysis; computer-based large surveys and use of the linkages methods. Global networks resulting from modern transport, media, capitalism, climate change and other factors leave no corner of the world untouched. In this regard, the linkages methodology of the new ecological anthropology will be applied to connect the ethnographic locale to nearby localities, the provincial, the regional, the national and the international processes. In here, what will be done, for the most part, is the basic paradigm of seeking linkages rather than studying the ethnographic locale as a separate, isolated community of residents.

In line with its focus on interaction, domination and exploitation, state inefficiency in the management of environmental resources at all levels is emphasized. Sovereignty, economic development and sustainable use of resources are presented as mutually competing principles in the theoretical critique of the state. As a result, despite the rhetoric of sustainable use of natural resources at the global level and the subsequent measures for a resource management regime that befits this, many ecological anthropologists cast doubt on the reliability of the state in this regard. Actually, some have considered it as an obstacle rather than a help. Based on Walker (1989), Bryant and Bailey wrote, "One aspect of the theoretical critique of the state concentrates on the possibility that this actor represents an obstacle to the resolution of environmental problems at the global scale" (Bryant and Bailey,

1997, p. 51). They added, "The primary goal of the world's states has been to pursue economic development even if, as experience has shown, this quest has been at the expense of the environment" (Bryant and Bailey, 1997, p. 51). They exposed that since the negative effects or 'costs' of such environmental problems as pollution and increased warming are globally shared, the environmental quest has resulted only in few states prepared to forgo economic development in the face of economic competition of capitalism (Bryant and Bailey, 1997, p. 51). This state of condition is better expressed in the following statements' of Volger (1995) as well:

> Ironically, a tragedy of the global commons ensues in which individual states (i.e. herders) continue with policies and practices that degrade the global environment (commons), while refusing all the while to give up the individual right to action (sovereignty) that is at the root of the problem. (As cited in Bryant and Bailey, 1997, p. 52)

Writing of this incapacity, it has also been remarked that the state is "too small" and "too big" to deal with regional, global as well as local environmental problems (Hurrell 1994, as cited in Bryant and Bailey 1997, p. 52). Bryant and Bailey's even more pessimistic view of the role of the state as an environmental actor is expressed in the following statements:

> Yet there is little evidence to indicate that this source of social power is even remotely compatible with sustainable environmental management. Indeed, the weight of evidence suggests the contrary view. Thus, on the one hand, states have tended to hinder the environmental initiatives of grassroots actors at the local scale while, on the other hand, preventing efforts to develop a comprehensive global approach to solving the world's global environmental problems. (Bryant and Bailey, 1997, p. 52)

Because of these contradictions (e.g. Bryant and Bailey, 1997) and the little corrective measures made by states and the lack of determination for a genuine global environmental management (e.g. Mische 1989, as cited in Bryant and Bailey 1997, p. 51), it is argued that the environmental problem will increase rather than decrease. I apply this theoretical perspective to understand local environmental degradation and improvement as a result of state domination or assistance in local environmental resource management.

Local perception, however, views the overall role of the state in their relation to environmental resources on a positive note, even though the implementation of specific policies could be criticized.

3.4.5 Ethnoecology and Conceptual Approaches to TEK

In ecological anthropology, ethnoscience was a phenomenon of the 1960's though its root was associated at an earlier stage in 1954 with Harold Conklin's dissertation "The Relation of the Hanunou Culture to the Plant World" (Nazarea, 2003). Conklin's "the ethnoecological approach" showed how native people's knowledge of the environment was rich and complex (Nazarea, 2003). Since then, anthropologists and other scholars have marveled at "native" people's knowledge. According to Nazarea, ethnoecology took two forms. The first was that associated with Conklin and which focused on exposing "western scientific ignorance about other people's ways of thinking and doing, and to point out its arrogance in dismissing anything that is different as being inferior" (2003, pp. 3-4). The second, which she associated with Berlin, Breedlove and Raven (1974), was aimed at looking for underlying similarities between natives and western scientific knowledge. Its aim was "to cross-refer native systems of classification to the Western scientific tradition- in this case, the Linnaean taxonomic system- and to demonstrate how native systems virtually match scientific taxonomies rank by rank, category by category" (Nazarea, 2003, p. 4). Further writing of this difference, Nazarea remarked (2003, p. 4) "the first approach places value on local knowledge by reference to its internal coherence and its environmental and sociocultural adaptiveness" whereas the second "subjects local knowledge to a test of legitimacy by measuring it against Western systems of classification and downplaying its adaptability to varying environmental demands and cultural dimensions that have shaped, and continue to shape, its many formulations" (Nazarea, 2003, p. 4). Both approaches were important breakthroughs in publicizing TEK. Nonetheless, this study is revealing in that

the difference between the two approaches is still one of the sources of the problems affecting the efficient documentation and utilization of TEK and know-how.

Nazarea acknowledged that ethnoscience "introduced a methodological rigor and theoretical depth that had been quite unknown in past cataloguing of the local uses of biological resources" (2003, p. 4). Notwithstanding this, it has also been criticized for idealizing the knowledge and wisdom of indigenous and traditional communities. This dissertation treats TEK in its own merit and looks for potentialities to supplement and improve WSK (Cf. Nuttall, 1998). It is also one aimed at showing, based on empirical data, that the epistemological difference between the two models of knowledge is, in some instances, apparent than actual. Thus, while due recognition is paid to WSK, both as a way to knowledge and knowledge itself, the approach challenges its academic hegemony over TEK. This said it is important to note that the approach adopted in this research does not subscribe to uncritical acceptance of TEK. Rather, some of its findings present TEK and beliefs as causes for the destruction of ecosystems and unwise application of natural resources. As many would agree, Kottak wrote, "In the context of population growth, migration, commercial expansion, and national and international incentives to degrade the environment, ethnoecological systems that have preserved local and regional environments for centuries are increasingly ineffective" (2006, p. 42). Given this threat, the major accomplishment of ethnoecology in anthropology has been that of documenting and upholding the perspectives of local actors (indigenous perceptions, knowledge and wisdom) in the analysis of human-environment relations. Population growth, migration and the other factors of globalization mentioned by Kottak have not been just matters of negativities for indigenous knowledge systems and their applications. It is to be learnt from this dissertation that there are instances in which WSK strengthened TEK rather than weakened it. The conceptual approaches to

TEK (including those which negate it) are discussed below in order to broaden the scope of ethnoscience as one of the theoretical strands of this research.

IEK or TEK is conceived of as enormous pool of facts, understanding, thought, belief and experience, emotional or spiritual relation with natural and cultural environments (e.g. Wolfe, J., Bechard, C., Cizek, P., and Cole, D., 1992; Berkes, 1999; Ellen and Harris, 2000; Ladisaluas and Kincheloe, 1999; Maurial, 1999). Crop cultivation, stock-raising, fishing; the capacity to manage, transform and use resources; and knowledge of resources, different species, their locations, and their recognizable characteristics form the pool of TEK. What is more, knowledge of how to catch and gather these resources, how to cook food or how to construct artifacts, how to prepare medicines and the like are part of the enormous pool of knowledge of indigenous or traditional people.

Berkes has given a working definition of TEK as: "a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment" (Berkes, 1999, p. 8). In this definition, this knowledge is conceptualized as dynamic, experiential and continuously changing. Notwithstanding this, the dissertation also reveals that TEK could be maladaptive but still transferred from generation to generation until such time that this is corrected. The literature also abounds with terminologies such as specific or place-based, complex, fluid, continuous or changing, contextual, small-scale or local, integrated, harmonious or balanced in their run down of the attributes of TEK. The nature of the interaction between humans and their entire biotic and abiotic environment is also emphasized in another definition. It goes "Indigenous knowledge is peoples' cognitive and wise legacy as a result of their interaction with nature in a common territory. Indigenous peoples, with a common history of colonization by Western culture,

constantly regenerate this knowledge" (Maurial, 1999, p. 62) though this might not hold always because of internal and external factors, including post-colonization contact with the west. He characterizes IK as 'local', 'holistic' and *'agrapha',* meaning 'not written down directly'. By holistic it means that there is no distinction between ideas, theories and practices. The findings of this research, nonetheless, refute this generalization in many respects. The localism attaches the knowledge to a certain group in a certain place (Maurial, 1999, p. 62)[43] but as the literature and the findings of this research show, there are even across continental similarities within TEK. Similarly, on the cognitive styles of indigenous people based on Cree, Murdock said traditional knowledge is more of 'visual-spatial cognitive style' while the modern (knowledge) is dominantly 'verbally and conceptually oriented style' (as cited in Wolfe et al., 1992, p. 9). In light of this definition as well, TEK is based on observation and learning. It is also holistic, qualitative, subjective, and experiential, transmitted orally and attached with social, spiritual and economic and non-economic parameters.

Sillitoe and Bicker wrote: "It [IK] includes all knowledge held more or less collectively by a population that informs interpretation of things. It varies between societies". (2004, p. 2) Writing on its dynamics, they further said, "It comes from a range of sources, is a dynamic mix of past tradition and present innovation with a view to the future" (Sillitoe and Bicker 2004, p. 2). This relates with the ideational definition of culture, but as it could be said of the rest of the definitions we saw, not all TEK is collectively held and forward-looking. Knowledge as a reflection of the social organization or structure of a society has its own organizational hierarchy. Thus, some knowledge is secretly held by a few, some by smaller numbers of people, and some by men or women. Some are of course held by the general public.

[43] Like some of the definitions of indigenous people, this definition of IEK narrows the repertoire of this knowledge to belong just to people who have historical connection with colonialism and dispossession of land.

Though all writers do not have similar position, WSK is largely taken to be exclusively abstract, based on literacy and numeracy and assumptions of reductionism, objectivism and positivism. Those promoting this scientific ethnocentrism claim western knowledge to be logical and rational whereas TEK is considered illogical, irrational or non-rational (e.g. Maurial, 1999). Such scientists further reject it as "anecdotal, non-quantitative and immethodical" (Cf. Wolfe et al, 1992, p. 11). Nonetheless, there is much practical evidence in the last two decades in support of the relevance and even the superiority, in some cases, of TEK/IEK to WSK. In spite of acknowledged or claimed differences between the two forms of knowledge, there are also some writers claiming similarities between them. Cotton wrote, "as research into both traditional and Western knowledge has continued, a number of important parallels have been recognized" (1996, p. 85). Strengthening his point further, he wrote "both traditional knowledge, and WSK [Western scientific knowledge], are inherently context-determined and both are continually reinforced through sustained interaction between theory and practice" (1996, p. 85). For Michael Fischer, all forms of knowledge are contingent, contingent because of their nature or because we cannot know everything (as cited in Bicker *et al*, 2004, p. 25). Hans Siebers has questioned even the relevance of the dichotomy between indigenous and modern, traditional and technological knowledge on account that the relevance of all knowledge is evaluated *a posteriori* rather than *a priory*. This is in line with the need to integrate the two forms of knowledge.

Like the term indigenous itself, defining IK or IEK or TEK has been quite difficult. While the term indigenous knowledge is preferred in the development circle, for some terms like local or traditional are preferable. Sillitoe and Bicker, however, would argue that "It is not easier to define local or traditional than indigenous". (2004: 1) For others, like Veronica Strang, any definition based on western model of thought contradicts the emic definition of knowledge while for others (e.g. Colin Filer) this exercise is bound to

showing a very subordinate political status of local or indigenous people. As some scholars argue, this position epitomizes the need for a definition and conceptualization by indigenous people themselves.

Writers, environmentalists, practitioners and others apply different terminologies or semantic cognates such as 'indigenous technical knowledge', 'local knowledge', 'folk knowledge', 'traditional knowledge', 'traditional environmental (or ecological) knowledge', 'people's science' or 'rural people's knowledge' (e.g. Wolfe et al., 1992; Berkes, 1999; Ellen and Harris, 2000; Ladisaluas and Kincheloe, 1999; Maurial, 1999). This is one of the sources of the definitional complexity (Ellen and Harris, 2000, p. 2; Ellen and Harris 2004, p. 297). For instance, the terms traditional environmental/ecological knowledge seems to be quite good at doing away with the "thorny", "politicized", "uncertain", "conflicting", "ambiguous" and a "strong moral load" (Ellen and Harris, 2000; Ladislaus and Kincheloe, 1999, Nuttall, 1998) of the notion of indigeinity or indigenousness. Nonetheless, not all manifestations of this form of knowledge and know-how are necessarily traditional. The term "local" is apparently helpful to tackle this problem. All the same, there are forms of this knowledge which are transnational and transcontinental in nature. Despite these caveats, I have opted to use the terms Traditional Environmental Knowledge or Local (Environmental) Knowledge in this dissertation since I find them to be less unsatisfactory than the others. I have deliberately avoided the term ecological not because it is less satisfactory in "ecological" terms. Its application, in the case of this research, might run the risk of rendering this form of knowledge more ecological or ecocentric than it actually has been.

The three approaches in use in current ethnobotany, namely the utilitarian, the cognitive and the ecological are used in an integrated manner to achieve a meaningful documentation and application of ethnobotanical data (Cotton, 1996, p. 63). The extension of this methodological approach from

ethnobotany, which is a science of TEK, to the full range of TEK is quite useful. However, ethnobotanists are also criticized for directing their research by their *a priori* scientific understanding, leaving yet another problem of integration to be surmounted. These three approaches are used in this research treating TEK on its own merit.

Scoones and Thompson's (1994) summary of what they observed in the literature of traditional or rural people's knowledge gives an overall picture of the conceptualization of TEK. They have arrived at three contrasting ways: the one that sees rural people's knowledge as 'primitive', 'unscientific', 'wrong'; that which treats it as 'valuable and underutilized resource' and that which sees rural people's knowledge and WSK as non-unitary epistemologies resulting from different agro-ecological, economic, sociocultural and political backgrounds (Scoones and Thompson, 1994, p. 16).

As already reviewed, Ellen and Harris give value to IEK but describe the term indigenous as 'conflicting', 'ambiguous' and one with a 'strong moral load' (Ellen and Harris, 2000, p. 3). Therefore, they said, it "might seem the least useful way to describe a particular kind of knowledge" (Ellen and Harris, 2000: 3). As Ladislaus and Kincheloe wrote of IK, the term indigenous is ambiguous and full of uncertainty (Ladislaus and Kincheloe, 1999). Commenting on the 'flexibility' of the definition of indigenousness forwarded, which leaves the matter to the discretion of a given people to be or not to be indigenous; Nuttall wrote: "The flexibility of this definition of indigenous peoples allows for many different groups already identified in ethnic terms to claim the right to be recognised as indigenous populations, be they Palestinians or Scottish Highlanders" (1998, p. 3). He also made note of the 'rhetorical strength' of the term indigenous as against local and minority groups for political assertions and defense of territories.[44] The bottom-line, as

[44] Ethnic or identity redefinition in Ethiopia since 1993 has resulted in some ethnic groups dividing into different independent groups, with territories of their own and local self-autonomy.

underscored by Nuttall, needs to be that "Whatever the differences and arguments over appropriate terminology the claim for indigenous (or traditional, or local) knowledge is that it offers an alternative to scientific and technological approaches to environmental management" (1998, p. 78). Arne Kalland hailed IEK for offering "rich notions of alternatives to the scientific paradigm" (2000, p. 321) whereas Willett Kempton described it as 'priceless' and its loss 'tragic' (2001, p. 49). The search for alternatives is also one of the thrusts of this research.

The critique made by Alf Hornborg on the general nature of the literature on TEK seems to add a new sense of purpose to this form of knowledge. He has proposed a shift of emphasis from studying it as a new form of resource to a focus on its socio-cultural contexts. His insight as a new leverage in the study of TEK is an advantage both academically and operationally. His critique goes as:

> Rather than approach indigenous knowledge as another 'resource' to be tapped, ecological anthropology might concentrate on the socio-cultural contexts which allow ecologically sensitive knowledge systems to evolve and persist over time. There are reasons to believe that the best conditions for such local calibrations are precisely when they are not being subjected to attempts at encompassment by totalising frameworks of one kind or another. In recognising implicit and inextricable local meanings as the very stuff of ecological resilience, a critical inquiry into human ecology might begin to confront the agents of destruction by modifying its own ambition to encompass. (Hornborg, 1996, pp. 58-9)

This writer also emphasizes the role of advocacy for ecological anthropology as it deals with traditional people and their environmental knowledge and belief systems. This is of course an aspect of political ecological anthropology which is already in some practice as in defending the rights to resources and cultural survival of natives or traditional people. Ultimately, while furthering this commitment is also a matter of beneficence of broader human reach, also benefiting industrialized societies, the need for the study of the socio-cultural contexts of environmentally sound knowledge and practices is not to be justified only by the need to protect TEK from external domination. This form

of knowledge is modified or changed also from factors emerging from within as rightly stipulated by culture theory, ethnoscience and historical ecology. Hence, whether the need to protect TEK from "encompassment by totalizing frameworks" is at stake or not, the focus on the mentioned socio-cultural contexts remains defensible. Accordingly, I have adopted Hornborg's stand in order to enrich the theoretical strategy of this research.

The work of Wolfe and his colleagues on non-native theories of indigenous resource use and management is useful. They call them the "physical economic anthropology" and the "ethno ecology" (Wolfe et al., 1992) theories. According to the first theory, the indigenous person works on the basis of the neo-classical, micro-economic models and accordingly works to increase return without the need to conserve resources. Nonetheless, they tend to deflect their position somehow as they hold diminishing return in the end might unconsciously protect resources from overexploitation. On the contrary, according to the ethnoecology theory, there are norms and values that work against the overexploitation of resources to ensure their sustained use. For the ethnoecologists, the protective cultural elements function consciously.

Finally, TEK could also be seen in relation to Arne Kalland's discussions of three-level environmental perceptions relative to environmental behaviors. Kalland divides environmental perceptions into empirical perception; pragmatic perception and institutional perception. According to his behavior-perception theory, empirical perception is the awareness we have of the different components of the environment, their detailed aspects and the action and interaction between these components and their consequences. Be it sensual or cognitive, this is the pure, undisturbed perception we could have of the environment. This is also the basis of the other two types of perceptions, but on its own, it is not usually capable of instigating positive or negative environmental behavior. Secondly, pragmatic perception is the filtered empirical perception that informs the environmental behavior of the

perceiving individual as an independent environmental actor. This becomes the behavior-ruling attitude in as much as the perceiver is free to execute it from the burden of social and state control. Thirdly, institutional perception is the collectively accepted way of perceiving and acting upon the environment.

3.5 Conceptualizing Resources and Their Degradation

A resource is a social construct, found in the realm of an ideational definition of culture. "Natural things and parts of nature are not considered to be 'natural resources' until humans place value, usually utility or monetary value, on them", writes Megan Squires in an article on the theoretical foundations of natural resource management (2004, p. 156). Squires mentioned of the North American wilderness, which was later, put to use but was regarded before as an obstacle to development. She also wrote about the north aspen forests of Alberta that were not considered resources till their use in pulp and paper manufacturing by Japanese companies (2004, p. 156). Accordingly, she concluded, "In both cases, nothing physically or objectively changed with the wilderness or forests; it was rather their subjective valuation or the way people viewed them that changed" (Squires, 2004, p. 156).

Values that cannot be expressed in purely material, utilitarian or monetary terms can also influence people's definition of a resource. Mostly, among traditional societies, on top of economy, resources and their uses are conceived ideologically, socially, morally and spiritually. The spatial and temporal effect, of course, appears to be universal as Squires' examples show. Also, humans' appreciation of resources is relational. We value a thing as a resource relative to other resources, especially with resources that fall within one domain. Just before two decades, tin-roofed houses were regarded as a symbol of wealth and prestige in rural east Ethiopia as against the traditional thatched, mud-walled houses of the common. Through |he years, environmental change which also resulted in the loss of thatches from the

ecosystem due to over-grazing and conversion of grassland to croplands, thatches became in scarce supply.

These factors remain to affect their definition of resources and decision-making. Even farmers of a watershed or an agro-ecology could view a phenomenon in a different way (Cf. Chapter Eight). The loss of soil from the plot of a farmer in an upper hill could be the fortune of the farmer in the downhill or in the valley plain (Blaikie and Brookfield, 1987). For the first farmer, it is a loss of fertile soil by means of erosion but for the second, it is a gain, an alluvial deposit meriting the most attractive harvest (Cf. Chapter Seven). In this case, not only have these farmers seen the same phenomenon differently, but they are also likely to respond in a different manner to environmental policies and programs relative to the management of this resource.

In general, there are different environmental ideologies that might influence the definition of resources and decision-making in natural resource management. They can be called the *technocentric* and *ecocentric* ideologies, and being at opposite ends of a continuum, they display a number of varieties (Squires 2004, p. 156). According to Squires, the *technocentric* ideologists are on the whole optimistic of humans' 'ability and ingenuity' to deal with resource scarcity and environmental degradation on a continual basis, as a result of current and forthcoming science and technology (2004, p. 156). On the other hand, the *ecocentrics* believe that things are scarce or 'constrained by natural limits' and 'moving beyond these limits has dire consequences'. In the long run, they argue, the ecological balance will be upset to affect the sustenance of human kind to an irreparable point. In between, are the 'deep ecologists', the 'soft technologists', the accommodators and the cornucopians (Milton, 1996).

The deep ecologists are opposed to the industrialized way of life and yearn a going back to a simple way of life friendly with nature. They can be called anti-modernism.

The soft technologists also are for a simpler way of life but still believe new technologies might be used to 'reduce the human foot-print' on nature and the environment. They are taken to be less radical. While being conscious of resource scarcity and the need to use nature wisely, they rely on technology and science. They also think that the standard of living should be kept at its current level, rather than reduced. The accommodators also rely on science and technology but accept the 'role of nature in setting limits' to the way we use or abuse resources. For the cornucopians, there seems to be nothing special: science and technology solves the whole problem of resource scarcity and environmental degradation (Milton, 1996, p. 92). One critical way of looking at the influences of these ideologies in decision-making in environmental resource management is to view them vis-à-vis TEK. *Technocentric* ideologists deny or most likely detract from TEK because of their moderate to excessive reliance on science and technology. On the other hand, the *ecocentric* ideologists attach worth to TEK, as they might also subscribe to a simpler nature-friendly way of life. In this dissertation, the ideologies and practices of natural resource management of small farmers, experts, policy-makers and the NGO community could be evaluated along this continuum, including their impact on the environment.

3.6 Conclusion

This chapter has reviewed theoretical perspectives and concepts in ecological anthropology and natural resource management. In so doing, it has demonstrated that the literature on the former evince more similarity than difference even though each has tended to go as an independent school of thought. It has also made a brief review of the beginning of the scholastic interest on humans' relations to their environments and the rise of the

ecological approach in anthropology. This was made to also underline that the similarity is not limited to contemporary theoretical perspectives. The review has served to underline that a composite and interactive theoretical perspective leads to better knowledge about human-environment relationships rather than what any one of the single perspectives could offer.

Notwithstanding their major similarities, the theories and ecological approaches reviewed evince some debates and controversies as well. Some have given priority to the material or bio-physical aspects of the human-environment relationship. Others have focused on the ideological aspect of it. What is more, the controversy-though subtly- involves whether conscious management of the environment is sufficient to achieve a sustainable management of resources or whether this has to be supplemented by unconscious environmental thoughts and practices. In this regard, the merits and demerits of religion and other cultural notions are considered, finally granting some importance to religions in seeking solutions to such environmental crises as threatened ecosystems, endangered species and diminishing resources.

Theories focusing on the relevance of culture also highlight the role of TEK in resource management. The perspectives reviewed partly grant worth and relevance to this form of knowledge whereas there are writers disregarding TEK in favor of WSK. There are some conceptual differences, however, even among those who treat TEK independently. The question of who, and which knowledge, is indigenous has been rather debatable. The important thing should be on the role of this form of knowledge to supplement WSK for a better management of the current environmental problems faced the world over. This perspective has been approached in the analysis of this research. Also, the theoretical position that critically inquires into the relevance of TEK is approached as there are communities that have degraded their environments applying this form of knowledge.

The theoretical perspectives and concepts employed in this dissertation have been selective and aimed at building a composite framework to bring forth a holistic understanding of smallhoders in their dynamic and interactive relationship with their environment under changing socio-environmental and temporal contexts. This processual and interactive approach, known as the new ecological anthropology, has not yet come up as a consolidate theory synthesizing cultural and ecological theories into a solid research instrument. The application of theories and concepts in this dissertation, in a way, is also a modest attempt towards contributing to this goal, partly based on local theories from the ethnographic findings. In this process, the theories are grounded (Cf. Punch, 1998), which I think, is a natural corollary of anthropological ethnography. In the same manner, the concepts reviewed come *posteriori t*o local concepts, categories and indicators, rather than *a priori* to them. As a result, the overall research exercise was a theory after rather than a theory before academic exercise. In other words, the theoretical perspectives were employed as memoires to look at a certain factor and not to determine how that factor worked on its own and in relation to others. The practice of grounded theory has been brought back in the reiterative processes of analysis and dissertation write-up.

The intersection between the anthropological theories of cultural construction and enskilment or situated learning, seems to be reconciled by Collignon who narrated her experience of fieldwork with the Inuit as follows:

> Inuit geographic knowledge, as I came to understand, lies in two main spheres: first, in experience gained through practice; second, in narrative learned by the transmission of the oral tradition. Experience includes the practical skills and techniques the Inuinnait use in their daily life, in particular when they travel on the land, ice and sea. Narrative comprises the words they use to talk about the land, particularly through storytelling and place-naming. Together, practices and stories lay out the Inuinnait understanding of place and space. (2006)

Each of the theoretical perspectives reviewed have strong aspects to contribute to a processual and interactive study of the human-environment relation as related by Collignon. Historical ecology rightly focuses on time as the past

affects the present and the present, the future. It also focuses on the study of the interpretation of the human-environment relation. While this is necessary, the issue of environmental adaptation, which it neglects, need not be forgone in an interactive ecological anthropology. What is more, studies of adaptation and interpretation are not mutually exclusive. Better understanding of adaptation to the environment also depends on explanation and interpretation. The relation of humans to the environment is also the relations of humans among themselves as individuals, groups, societies and countries interact. Power and authority, therefore, play crucial roles in the execution of all human institutions. These institutions in turn, affect the ways individuals and communities use or abuse their natural environmental resources. Thus, the integration of enculturation and enskilment in the study of human-environment relations would be incomplete without the consideration of history and politics.

As already mentioned in the scope of the research in Chapter One, this theoretical approach has been chosen for practical reasons. The theoretical approaches in ecological anthropology bear great similarities. Actually, political or historical ecology, to a large extent, seem to be subsuming the other theoretical approaches. And for a research of this nature, these theoretical approaches would fail achieving the desired goal without the use of cultural anthropological theories as well. It is an old critique that the theories of culture have their own limitations in the analysis of human-environment relations. For instance, Alfred Kroeber has argued that the causes for cultural changes are to be found within culture alone. Tim Ingold's enskilment theory gives precedence to the direct, actual experience of the environment in opposition to the theory of culture to understand the relationships between humans and their environments. An interactive and processual understanding of the subject-matter requires considering the influence of both the sociocultural and the bio-physical environment (Cf. Collignon, 2006). The comprehensive nature of the research, even though it is based on a few

themes, has made it a necessity that composite theorization be employed in the analyses and interpretations of its findings.

CHAPTER FOUR: SMALLHOLDER-AGRICULTURE-ENVIRONMENT NEXUS

4.1 Introduction

This chapter discusses local understandings of the environment, agriculture and agrarian environmental resources. Time is an important aspect in the analysis of human environmental relations (Balee, 1998; Crumley, 1994; Crumley and Marquardt, 1990, cited in Balee, 1998). In traditional societies such as Ethiopia, oral literature is the main source of information on the past; especially with regard to environmental history (written documents are inadequate). This chapter considers gradual and short-lived environmental changes. Throughout the last half century the communities I worked in have been interacting with the wider Ethiopian state and the rest of the world. Among different aspects of their lives, this interaction has also affected their resource use practices and survival strategies amidst changing natural environmental conditions. As the immediate and the broader environmental settings have changed, so have the lives of these people. Thus, the notion of space, another linking thread in this dissertation, has also been affected. While these important themes are also discussed in detail as the remaining chapters unfold, in this chapter, they are treated in anticipation of these later discussions.

Thus, the chapter provides further background for a better discussion and understanding of the major themes considered in this research. Chapter Three largely reviewed theories and concepts. Chapter Two has also considered the different environmental degradation explanations given by academics, governments and others. On top of that, this chapter treats local environmental theories and perspectives. Therefore, inasmuch as it serves as the background for the forthcoming chapters, it also serves to strengthen the earlier chapters with the aim of consolidating the theoretical and conceptual foundation of the research. Thus, the local theories described in this chapter are employed in the

analysis of the forthcoming chapters as are the theories, explanations and concepts in the preceding chapters.

4.2 Understanding the Environment

4.2.1 The Conception of the Environment

Socio-physical

As a socio-physical concept, the environment among the Gäddärro people is primarily understood to mean the village *(got'* or *mändär)* or the *k'iré*[45]. The village is seen as the hub of their environmental conception in which the social is made prior to the physical. While the term *got'* is also a spatial or physical concept referring to a non-settled space as well, it is frequently employed to refer to a village. On the contrary, permanent human settlement is mandatory for a space to be called village. Defining the environment, Täšalä, a farmer from Binné said, "By environment we mean the things that *bound us*; the things that *live with us*; the village *we live in*."[46] Even though the majority of villagers primarily refer to the village or the social environment, placing persons at the center of the concept environment, the definition given by this local expert could be taken to stand for the rest as well. Similar local definitions of the environment are to be found ultimately after probing villagers during interview sessions. The things that bound people come in several shapes. In the first place, the material and the ideal are encompassed. Secondly, the things that bound them have both horizontal and vertical orientations. Thus, such things as houses, livestock, land, trees and crops bound persons as part of the environment. This being in its horizontal orientation, vertically, the environment is broadly categorized as lowland, mid-highland and highland. The atmosphere that surrounds them is also viewed in this line of orientation. Soil, water, wind and the sun- understood as the four foundations of the world by some of the local

[45] This term basically refers to a village self-help association mainly used for the organization of burial services and condolence.
[46] Interview transcript

experts I interviewed- form their essence of the environment from the side of the tangible world.

Their vertical orientation of the environment has a trace of the anthropogeographers of the early 20th century. Some of the thoughts of Aristotle and Montesquieu are also to be sensed in their perception in this regard. It is believed that the natural physical environment shapes the temperament of humans and livestock as well. Accordingly, lowlanders are perceived to be more sociable than highlanders. The same attribution is given to livestock as well. As a result of the lowland-highland ecological difference, it is said highlanders prefer to have an animal raised in or acclimated to another highland ecology than from lowland. The adaptability of lowland livestock to the highland ecology is said to be difficult. The same applies to moving herds from highland to lowland. According to my informants, these differences are experienced even within Gäddärro FA itself.

Table 2: Summary of local perception of major behavioral impacts of the environment on human beings and animals

Lowlanders	**Highlanders**
More sociable	Less sociable (or more individualistic)
Easy-going type; soft-hearted	Vindictive and envious; heavy-hearted
Trusting, more of unsuspicious or unsuspicious	Highly suspicious and untrusting
More susceptible to drought but less susceptible to hunger	Less susceptible to drought but more susceptible to hunger[47]
Extravagant economic behavior	Thrift or wise economic behavior and perhaps mean

[47] The phrase "let a highlander not starve" is occasionally made by urbanites to stress the degree to which highlanders are vulnerable when they migrate to urban centers in search of something food to survive famine. Such remarks are made in actual reference to the images of starving and dying people during the recent famines which ravaged the province of Wello.

Villagers' application of language in the conception, comprehension and transformation of local climate and land is so complex and fascinating. It will be a mere pretention to want to give a full account of this in this writing. Therefore, I shall limit myself to some important terminologies that might better serve the interest of this dissertation. The Amharic term *akkababi* is the official lexicon used as a counterpart to the English "environment'. This is the same term used in the country's environmental policy as well. Etymologically, the term is derived from the root word *makïbäb* that is to circle or to encircle. It connotes "that which surrounds" as the English term "environment" does, as is also perceived by academics (Cf. Descola and Pálsson, 1996; Ingold, 2000; Kates 1976; Ittelson, Franck, and O'Hanlon, 1976).

At local level, as their notion of the environment is primarily anchored on the village, the meaning of the term *"akkababi t'ibbä'k'a"*, the official equivalent for "environmental protection", primarily refers to the social and political security and wellbeing of a community. This includes such responsibilities as patrolling a settled area as well as protecting members from intrusion and external aggression. In the beginning of my fieldwork in 2007, in a group interview on this subject, some old men in K'és Gända told me that had they not seen me around the Gäddärro FA office some days before with experts and local officials there, they would have required me to produce legal documents stating my identity. That could have served to ensure that I would not be a threat to this community. I was told this was the normal way of behaving to protect their security and that of their community members. The old man named Mammo, who later became one of my key informants, stated, "That means *akkababi t'ïbbak'a*": "*environmental protection*".[48]

In the face of this, it is also necessary to note the focus on the physical environment in local notions of environmental protection. Another farmer, Muhé, from Awraççа, remarked, "Everything here is part of our environment,

[48] Field notes

take land. Environmental protection means protecting the forests from clearance, water from wastage and keeping the sanitation of the environment like using toilets and burning garbage."[49] This matches the official and academic definitions of the term. Nonetheless, it does not mean that this conception is well perceived by the entire villagers as the former is. The latter conception is rather held by some farmers and mostly by the young who are exposed to modern education.

Coming back to the notion of *akkababi,* in their everyday language, the word is among the least frequently employed lexicons. Instead, *got'*, the local term for village, and its equivalent, *k'iré,* are the ones normally applied. Linguistically, nonetheless, even the smallest, specific landforms within the bounds of villages and neighborhoods are identified and named. Most of these names reflected the history of these landscapes.

The basic notional difference between the terms *"akkababi"* and *"environment"* could be put as follows. In English, it is grammatically correct to forward the question, "Where is your environment?" Semantically or in usage, however, it is incomprehensible. Actually, the very idea of conceiving this question could be alien to the native speaker of the language. To Amharic speakers, nevertheless, asking: *"akkababih yät näw?"* or *"käyät akkababi näw yämät't'ahäw?"* which is structurally the English counterpart, is correct, both grammatically and culturally. Hence, in Amharic, it is equivalent to saying: "where are you from?" or, "which village, town or city are you from?"

As already mentioned, the term *akkababi,* first and foremost, signaled the village, the *k'iré*, and secondly the physical environment in which villagers lived and worked. The village is the hub in their spatial cosmology of the universe. It needs to be mentioned that unless prompted, the village, the

[49] Interview transcript

neighborhood and to some extent the FA of Gäddärro remain to be their environment for these people. Therefore, the term *akkababi* is nearly synonymous with their locality. From this center, their conception of *akkababi* expands to include neighboring villages, neighboring farmers associations, and the entire district of Wärräbabbo and so forth. All the same, it rarely went past what was known as the province of Wello. The village, nonetheless, is not a distinct socio-physical organization. Sparsely located homesteads- except for some smaller clusters or hamlets- scattered over the entire terrain people called their immediate environment, formed the village. Within this terrain existed all the living and the non-living components of their immediate environment. Therefore, the village is within the farm and the farm within the village; the homestead within the farm and the farm within the homestead. And, of course, the individual within the environment in a way that suggests what William has said, that: "Our working assumption is that the individual cannot be separated from the environment. He is part of the system he is experiencing, and the ways he experiences it become part of the environment he in turn experiences". (Ittelson et al., 1976, p. 192) This also means that as stated by Harmen Chapman regarding the dual relation between human consciousness and the world (1966, p. 79) "*empirically* it is contained in the world; *cognitively* it contains the world." In a way, this might challenge the assertion that the environment is that surrounding humans. The environment could also be surrounded by humans, meaning their consciousness, weather their imagination of it is preceded by empirical perception or not. The different texts I have been able to collect in my fieldwork among the Gäddärro people have revealed that their perception of the environment supports this dual connection of consciousness to the environment.

This spatial embodiment of otherwise distinct environmental entities has, for years, influenced their social organization of labor and village life. In theory, their notion of the environment as a globalized concept reflects signs of encompassing far away geographical locations beyond their influence and direct

experience. Relief and development aid and the media have made even far countries as Canada and the US known to villagers over the years. A few individuals migrated to Europe and North America, in addition to the massive migration to the Middle East. All these factors have impact on the perception of their immediate environment and their interactions with natural environmental resources. Finally, it should not be forgotten that the village is his or her *akkababi* to any person from Gäddärro, irrespective of sex and age. Spatially, this is also the primary unit of their percept of territoriality fixed in the concept of *k'iré,* a false friend of the term *gosa.*[50]

Agricultural endowment

Comparatively speaking, the Gäddärro type agro-ecology is considered as the best for humans and for agriculture, supporting most of the crops grown and livestock raised in the country. Based on the multitude of crops grown, the phrase "all the 12 types of crops in the world" is applied to extol the environment by its inhabitants. Everybody boasts that their land grows everything but *lanba* and *ašabo*, to mean kerosene and salt, respectively. This expression, all the same, is symbolic rather than straightforward. Of course, during adequate rainfall seasons, many households could harvest from their fields probably more than what is needed to carry them across the year. For some households this is certainly so even when the environment is said to be somehow bad. The hope of their environment as described above, is primarily to be achieved if "there is the gift of nature" expressed in the phrase *täfät'ïro käsät't'än*, which principally means if there is rain. Secondly, the phrase "if government is with us", which is stated as *mängïst käññа gar kähonä* is employed. Together, these circumstances are emphasized as factors defining their survival and relation to the environment. These 'ifs' are so symbolic and complex. It could be said nearly the whole gamut of the research is about them

[50] This term basically refers to cognatic lineages but is also applied to refer to people living in one village irrespective of consanguinity and marital kinship. Thus among the communities I studied the term is both a kinship and a spatial concept.

as they are enmeshed with culture, TEK, nature and politics (See the theoretical synthesis in Chapter Three). Symbolized by rain, of course, good rain; the first if clause is to be fulfilled, if the agriculturally ambient natural environmental conditions are to be fulfilled.

The second if relates to government response which has been partly hung on the threads of international relief aid and development cooperation. Timeliness, adequacy and beneficiary targeting are the major parameters by which the importance and impacts of these forms of assistances are judged locally. Besides the widespread belief holding these ifs as the cornerstones of their survival that a farmer needs to be diligent and perseverant is also a pervasive local theory. Even though this could be hampered by bad nature, anger from the spirits or other factors and lack of external support, they have never been good reasons to slack. In the face of this manifest theory, at times, I have also heard villagers convey a sense of hopelessness from these factors. This was so in particular when much energy and effort exerted on farming was to be rendered useless or rewarded with dissatisfying results. (This notion is discussed in sub-section 4.2.2 below).

Micro-ecological variations and environmental risks

Environmental resource bases such as land and soil are varied among neighboring villages and even within a village. For instance, when Mïsïräta and Awrraça, which are more moisture-stressed, are affected more by drought and the pest stock borer, Absaro and Šola Gända, which retain better moisture, are said to be less affected. Owing to the same factor, farmers from these villages have somehow differing views on drought and water-logging. What is more, as a result of environmental problems of broader regional characters, these people have been living amidst continuous environmental risks, hazards and their negative consequences. Their memory of environmental constraints, date back to the famine and epidemics, which devastated East and North Africa from 1988-1992 (Pankhurst and Jonson, 1988). Since then, environmental constraints

of different nature and magnitude have been experienced all the way to the present. In 2009, more than 6 million food-insecure Ethiopians, including the communities of this research, were in need of emergency relief aid. Drought, crop pests and diseases, soil erosion and fertility depletion, deforestation, inconvenient geomorphology, population pressure and land shortage, oppressive and inadequate government policies and regulations[51] are the major social and natural environmental constraints for impoverishing farmers (Cf. explanations on environmental degradation in Ethiopia in Chapter Two). These physical and social environmental difficulties have over the years negatively affected the life and livelihood earning capacities of these people. The combined effects of these problems have resulted in their being vulnerable even to smaller spells of drought or economic shocks. There is good local awareness to this rather long-standing state of vulnerability to environmental risks and hazards. When risks happen and their impacts are acute, as in drought, villagers had at times undergone starvation, famine, diseases and deaths. The recent 1973-4 and 1984-5 notorious famines are perceived by farmers to result primarily from the natural problem, drought.

Owing to widespread poverty and inadequate fallback strategies until the government has introduced a continuous framework of support in collaboration with the international donor community, environmental shocks have always been translated into food shortage, and if not corrected soon, into food insecurity and then, famine. It was often explained to me that the predominant local explanation for environmental problems such as drought, excess rain, pests and diseases is divine retribution sent to punish them for their sins. For instance, villagers could be sinned for trespassing God's laws as in theft and adultery. Unless problems are corrected, it is believed that God shall send on them any form of punishment. Droughts and all the rest risks and hazards normally called natural are largely expressed in this fashion. Population pressure, wrong

[51] Only a few of them are found to have this level of political awareness whereas many farmers explained some of the government resource use measures as restrictive and dis-beneficial to their way of life and economy.

agricultural practices such as plowing marginal hill lands and tree felling without replacement are regarded by villagers as causative factors on the part of humans. Nonetheless, this knowledge is accompanied by the widespread feeling that farmers do not degrade the environment without necessity, which in effect, is breeding another environmental risk in the social side of it. An old man from Awrraça, Ayyälä Täkkä, once interjected as we were having a discussion, "I do not clear trees; if at all I do I do that only inasmuch as my survival dictates".[52] Such a perception is also held by many writers (e.g. Mesfin, 1986; Kebede and Hurni, 1992). Turning the religious explanation to the relations among politics and economics or politics, economics and then nature, is the thrust of political economic and political ecological approaches (Blaikie and Brookfield, 1987; Kottak, 2006; Nuttall, 2009).

Lack of knowledge or ignorance is also mentioned by farmers as a cause for these environmental problems. Government policies or lack of good governance might also be implied in their explanations. For them, nonetheless, these environmental problems and their human consequences, more often than not, are considered to be the result of their impaired relationship with their Creator, God. Any form of sin committed severs the social relationship among themselves and then their spiritual relationship with God.

Linkages with the central government and the international community do also affect the environmental risk perception of villagers. For instance, if we think in retrospect a famine victim in the research area in the 1888-92 and imaginatively compare him/her with a food insecure or famine-threatened person in 2009, the two would have different perceptions of the environmental vagary- drought- merely because, then, the society was a much closed one. Talk not of international relief cooperation; even the local provincial chiefs had limited resources to come to their assistance. On the contrary, the famine threatened person in this period lives under relatively well-built and structured regional and

[52] Interview transcript

national early warning systems, regular international relief appeals, a system of relief resource pre-positioning and food/cash handouts. There are also other favorable aspects from the external world. Thus, this person is better positioned to preempt the impending threat. This hypothetical perceptual difference could serve as evidence to highlight the cultural and historical bases of environmental risk perception. In the first case, individuals are poised to suffering and death because of a natural vagary. In the second, they are qualified fit for much desired relief resources provided that it is timely and sufficient. Much self-exaltation in the research area of the environment in spite of the state that a considerable portion of households are forced to live by relief handouts from three to nine months of the year, is one of the evidence that the external environment is a factor affecting local people's perception of their environment.

Though the risk perceptual process is primarily a matter of collective norms and values, idiosyncratic differences account in some instances. In cases where existing TEK finds it difficult to cope with the unreliable and capricious character of nature-typically rain- individuals might perceive risks differently and act accordingly. The processes involved in such instances and their consequences on farming households are discussed in Chapter Eight in relation to the *bïllagi* drought of 2008. Added to this unpredictable nature of environmental risks is the difficulty that farmers face comprehending the constraining processes in their locality. The knowledge of soil erosion, again this shall become clearer later in this thesis (specifically in Chapter Seven), is subtle and difficult. In other words, this means that environmental risk perception, apart from being cultural, is also experiential (Cf. Ingold, 2000; Pálsson, 2006). At least two important factors could be mentioned here. First, some stimuli of the external world are not simply discernible by sensual perception. Second, the problem analysis of some risks is quite a long process. As a result, there is a possibility that the risk takes place before its problem analysis was complete or even began and decision was acted. For instance, a farmer might suddenly get his plow stuck in the field from roots, stones or

boulders sitting underneath. He can break his implement, have a ribs injury and his oxen affected. However, irrespective of the knowledge that such a risk is a possibility, he cannot be aware of a specific risk unless he has known or experienced that specific part of the field. Here, it is remarkable seeing how individuals could operate in their environment nearly for life without a full grasp of its risks. In general, while the theory that one might run the risk of such a setback while plowing is within the general purview of farmers' knowledge, the theory does not keep one alert all the time plowing is done. It is the moment he encounters the problem that his theory gets the effect of informing behavior now and in the future while plowing that specific spot of land. This analytical framework could be applied in the interpretation of other theories of farmers and their translation into practice. Among many cases in this research, this is where Ingold and Pálsson's theory of direct perceptual engagement or situated learning prevail.

Risk awareness about soil erosion and its conditioning is more or less a similar experience. My research assistant, Yïmam, never thought that erosion that "shrinks" the land as it takes away the top soil could also cause agricultural land shortage. Upon hearing this from one of my informants at a field observation, Abbäbä, from Awraççа, he started to inspect the landscape we were on more consciously. Reflecting on the knowledge he thus received, he started justifying the new knowledge in that eroded landscape crowded by rocks and boulders. At a point, he was so astonished by his confusion to relocate a threshing ground his father was using while he was a young boy. Finally, he said he managed to locate the site next to the boulders in this place named *näççaté*, after the whitish color of the soil. Such incidences reveal the constraint that is placed on perceiving the operational environment. In other words, it means that smallholders might not perceive in full the environment they operate in.

Religious/spiritual understandings

Another aspect of local environmental understanding has to do with spirits as part of the intangible environment. People would tell me that the local environment is full of good and bad spirits. Persons (living and dead), animals (domesticated and wild), villages, farmlands, trees, rivers and wind harbor some form of spirits. These intangibles are part of the social and the physical environment with potential effect on environmental perceptions and practices. The village as a corporation with its institutions and organizations is also composed of these spirits.

Further structuring environmental knowledge among the communities I studied is the living and the non-living concept. The ecosystemic notion that God has good reason to cause the existence of all living and non-living things is quite pervasive. However, following their religious belief that God has made everything to the service of humans, their religious view of nature as an ecosystem is rather anthropocentric (Cf. Tucker and Grim, 2001). Thus, at the depth of local thinking, the freedom for existence of the non-human elements of the environment is subordinated to the superiority of human beings.[53] This is also in line with Tucker and Grim's critique that Western Abrahamic traditions of Judaism, Christianity, and Islam hold humans above nature, contributing to the misuse of the environment (Tucker and Grim, 2001, p. xx). Of course, differences in opinion exist among villagers about what things in nature are beneficial to humans or not. For instance, wild beasts (such as hyenas, porcupines) destroying field crops and attacking livestock are generally regarded as harmful. Only some men attached some human importance to these beasts.[54]

[53] As shall be discussed in this dissertation, even the right to exist of human beings is clearly biased in favor of the current people and their needs that is the now and here. This is one fundamental aspect of their philosophy, also affecting their environmental behaviors in resource management.

[54] Hyenas and porcupines are among the major pests attacking their crops.

In June 2008, about a year after my first arrival in the field, I was corrected by my assistant Yïmam about a conversation I had with friends. It had so happened that I opted to extend by a week my trip back to the capital to see my family. Those friends in the field who knew that I was scheduled home wanted to find out why I was there still. I told them the reason and that I would be leaving after a week. My assistant leaned towards me and whispered: "What they would say is 'I am going to fetch fire wood'".[55] I inquired why and he replied that every village has got its own spirits (locally called *k'ut'ïb* or *abdal)*, a male or female. They follow on the movement of each villager, envy them and get disappointed when a resident leaves them. Therefore, in order to conceal from the spirits a person is leaving, even on a short errand, one would, if at all s/he should, just tell others in this customary phrase. Upon inquiring further, he told me that I was not expected to mention even my final departure at the end of my fieldwork. Villagers would know that I was leaving for good anyways. It made me reflect on two issues: that these people lived in a dense world of spirits, a forest of spirits, which also influenced their environmental behavior. Notwithstanding this, the root cause of this behavior could also be the need to confuse the enemies in the social environment in which envy and ill-wish existed. It might also be the case that, as in the communities I grew up in east Ethiopia, people need to refrain from mentioning that they are leaving to somewhere for fear that this could translate into a permanent departure, death. The work of spirits is also implicated here.

It is also important to note that each days of the week have their saints which affect farmers' behaviors in some ways, individually or in group. For instance, three days of the week are observed in this manner by all members of the FA, whereas the rest are observed by individuals based on their personal experiences and interpretations of those experiences in relation to their lives. In both cases, agricultural activities are not performed. Of course, many individuals

[55] Field notes

experience a special ritual session dedicated to these days. The typical tradition used to be that if farmers plowed, weeded or did other major agricultural activities on Wednesdays, Fridays, and Sundays[56] it was believed that the area would be hit by windfall and hailstorms. *Gosa* leaders used to inspect that this religious proscription was not breached. Nowadays, the force of the *gosa* is being rendered inefficacious in this regard and it has become a matter of personal discretion to observe the custom. In practice, I have observed in the field many people perform these agricultural activities during these days.

Finally, it is important to note that comparable to the ecological theories reviewed in Chapter Three, local cultural understandings of the environment blend the material and the ideal, or the tangible and the intangible. Attempting to separate the two is difficult to imagine for those among whom I lived and worked. The material affects the way they lived with the ideal and the ideal affects the way they dealt with the material. The perception of farmer-environment relationship is generally comparable to the assumption "the individual cannot be separated from the environment. He is part of the system he is experiencing, and the ways he experiences it become part of the environment he in turn experiences". (Ittelson et al., 1976, p. 192) Generally speaking, environmental limitations, their causations and effects are understood religiously in the same way by men and women. The exception is somehow with some of the young people who are exposed to modern education and would tend to express nature and environmental risks in secular rather than religious terms. However, switching between the two perspectives is not uncommon for villagers irrespective of age, sex and education.

[56] For me as a researcher, these days were of especial importance to find adults and most elderly people in a relaxed situation relatively free from the daily intense requirements of achieving one's wherewithal.

4.2.2 The Homeland Environment: Its Hope and Despair

We already know that the image of the homeland that grows all the "twelve types of crops in the world[57]" is a dominant perception of the environment. For the people I lived with and studied (who are mid-highlanders), lowlands lying across their land, such as Millé, offered ample amount of cultivable land but also tremendous hardships. In the past, some informants said, their heat, hostile beasts, and the Jinn, the *holläta* (malaria) were ventured only by daring farmers from the mid-highlands and the highlands. Migrant laborers to such places as Afar, Mättämma and Hummära are testimonies to the difficult lived experiences in lowlands. Highlands are cold and their agro-ecology does not allow producing a range of crop varieties as mid-highlands such as Gäddärro. In the positive sense, lowlands symbolize plenty land and hence affluence with respect to some crops such as sorghum and chickpeas. In the negative sense, as already mentioned, these places caused impaired health and loss of life. This happened in the face of the rest of the lowland environments occupied by their residents.

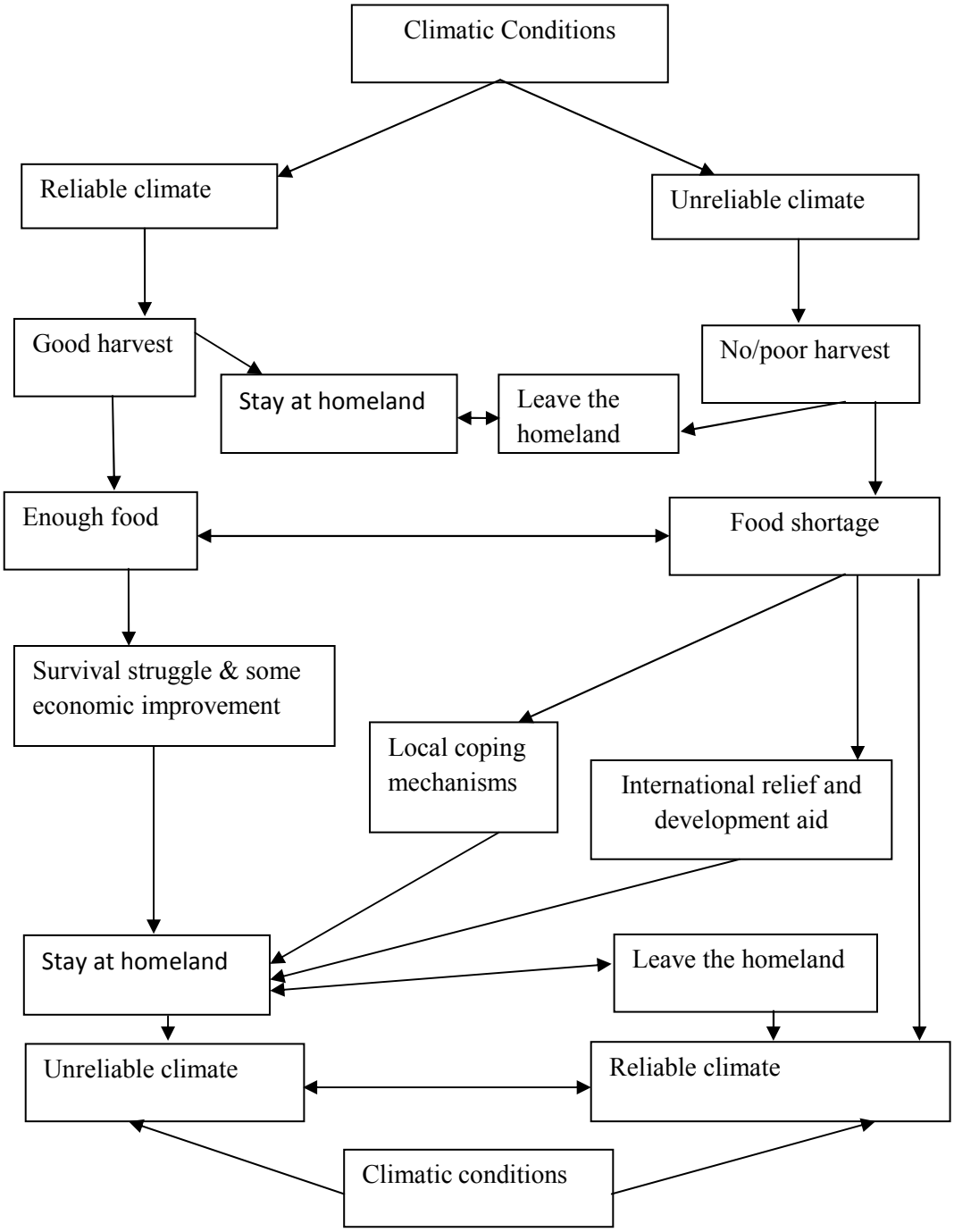
The comparative advantages of the mid-highlands have always been subject to change. The weather drastically changes between seasons and even within a season. Drought and moisture stress happen frequently. And so do pests and other productivity reducing factors. These happen amidst the exaltation we have already seen. When nature keeps in tune with their admiration of their ecology, there will be good rains and harvests. The other environmental risks will also be less of a problem, if they are not completely done away with. At a higher level of abstraction, farmers apply a joint presence rule in the conceptualization of their homeland. On the one hand, their life presents hope and a sweet part of life to them. On the other, it causes despair in them because of its bitter part of life. This describes their village, Gäddärro and Wärräbabbo. It does not let them *live* and it does not let them *go,* either. This is comparable to saying, it does not let them *enjoy life* and it does not let them *die*. The local phrases *nur-tagär, hid-*

[57] The twelve crops of the world are…

tagär: "stay in the homeland-leave the homeland" are used to symbolize this challenging experience of the homeland. A similar phrase employed is *abbïl-assïl,* also symbolizing the affordances and limitations of their homeland, its environment and agriculture. These days, as a norm, farmers' perception of their homeland cycles between *nur-tagär* and *hid-tagär* or between *abbïl* and *assïl*[58]*,* meaning between *affordances* and *constraints*. On the part of the older generations, this continual shift between the two, or the ambivalence, is the single most important characteristic of their perception of the environment, which could also be bifurcated as *knowledge* and *ignorance.* Therefore, at a high level of abstraction, this joint presence rule is employed in the conceptualization of their homeland, where "hope" and "despair" or "sweetness" and "bitterness", continually recycle ultimately preventing them from characterizing their environment either as *sweet* or *bitter* but *bittersweet*. Of course, this rule might be breached sometimes as their perceptions might tend to be more of one or the other. In general terms, however, the rule prevails as the dominant mental characterization of the homeland, especially among the older generations. Behaviorally, the younger generations are able to break away with the shackles of this perception (but also supported by the older generations) and migrate in search of a better means of life.

[58] Villagers did not have other terms for these words. From their meanings it is apparent that *abïll* is related to the verb "*mäblat"* which is "to feed" whereas *asïll* is related to the verb *"masïläl"* which is "to make thin".

Figure 3: Schematic representation of the cyclic abbïl-assïl or nur tagär-hid tagär concept



The above schematic representation needs to be explained further for better comprehension. In the first place, the scheme is origin-based; meaning most of the villagers experience it without migrating out. Secondly, it is about the older

generation rather than the younger who are able to migrate out. Some of the older generations do internal labor movement without leaving their homeland for good. Those who do not go out as such (the majority) cycle between the two ends of the conceptual map mentally, while remaining *en situ* physically and socially. A few might go out permanently or for a longer period out of extreme poverty or personal interest. Those establishing town-based economy do also leave the homeland but do this only partially. Most of them establish dual residence without leaving their home base. Therefore, the scheme is more of about understanding the uncertainties of the local environment and agricultural performance more than how villagers practically responded to their local environmental challenges. The sociological concepts of pull and push factors cannot be compared with the *abïll-asïll* concepts here. These sociological concepts are rather comparable to those of the conditions of the younger generations who migrate out, including those doing so for good. (Migration as a coping strategy is discussed in Chapter Twelve).

These ecological conditions are also given as the reasons why farmers sometimes lack determination for work, or why they are "lazy" in their own language. Drought can render the crops useless at any time of their developmental stage. Hailstorms and excess rain could do the same damage. Such destruction could also be caused by pests among the biotic stresses. As a result of these ecological factors, farmers could lose hope and stamina, also leading them into half-heartedness or a state of 'laziness' or indetermination in their agricultural endeavors.[59]

[59] These factors also bear environmental differences among physically near communities. For instance, in Gubbisa where maize matures later because their soil is "cool" even though they plant earlier, hailstorms could destroy their crops as they are maturing. At such a moment, places like Awraççа could have collected their harvest already because their soil is "hot", even though they planted later than Gubbisa.

4.3 Cultural Understandings of Resources

Creation, quantity, utility, ecology, change, spatiality and temporality are the basic concepts employed in local understanding of natural resources. Thus, resources are categorized differently along with their corresponding attributes. Based on the main thrust of this research, the emphasis here is on agrarian resources within the local physical and social environments. Current local understandings, ethics and values of nature, as shall be discussed below, have been extending from the center to the periphery like that of their notion of the environment. This has got an effect on how environmental resources are viewed. Owing to natural and human-made processes, the bio-physical environment has undergone tremendous changes, and so have the natural resources in them. The principles, ethics and values employed to understand agrarian resources are treated below in general terms.

4.3.1 Local Notions of Resources: The nature-culture unity and dichotomy

After some degree of confusion in the field resulting from my inept use of a rather technical and bureaucratic jargon, thanks to my field assistant, Yïmam, I knew that the appropriate local terminologies for *"natural resources"* were either *"yallah sïra"* or *"Allah yähäläk'aw"* and not the technical-official term "*yätäfät'iro habt*". These local words literally meant *"God's deed"* or *"God-made"*. Otherwise, what these people understood by natural resource (nature) is largely rain, which is regarded as the source of everything or the base of the ecosystem. Hesitatingly, some of my informants have added such things as livestock and field crops to be natural resources. Their logic is that if there is rain, then, there is everything. There is no agreement on whether everything natural is a resource or not. Once I was able to communicate with them in their category, I did not have more people squirming and pressing hard in their minds. Livestock, wild animals, mountains, rivers, rain, soils, rocks, trees, grasses and such other things were among those free-listed as natural resources. The farmer, Muhé, from Awraççça, defined nature as:

> Everything that exists, material and ideal, is nature. Trees, grain crops, livestock are natural. Death is natural. Insects like locusts are also natural. Time, as reflected in the coming and going back of rains, or rains and droughts, affect the status of all natural things. When there is rain, they grin and laugh and when it is drought, they wilt, get dry and become weaker. The change between the two conditions takes place so quickly. A cow gives milk during the rains and stops that during the dry seasons. The land does the same. The cycle comes all over again; it is a non-stop process.[60]

The concept *täfät'ïro* (nature) initially referred to all things created by God and towards whose creation humans have had no contribution. Once this is established, they apparently command some degree of ease expressing what the term *"human-made" (säw särraš)* meant for them. *Çat,* oranges, hopes, coffee, eucalyptus and all other trees planted by humans are regarded as human-made. This is so because local people or their ancestors did not find these trees existing naturally as part of the basic environment when they were born. Since these trees also needed to be planted and cared for by humans, they are considered as human-made. On the other hand, indigenous trees like podocarpus *(zïgba)*, junipers *(t'ïd)* and olive tree (*wäyra),* on to which they were born, and found them growing there naturally, are considered as natural trees/resources. In this regard, "They were already there in nature and we just found them" was one of the oft-made remarks I used to hear. The reasoning is that exotic trees introduced by government, including forage trees, have been technologically engendered and refined before reaching Gäddärro somewhere else by human hand. Some farmers firmly declared that the eucalyptus tree[61] was not natural at all, since it was imported from *bahïr mado*, the overseas. Among local understandings of invasive species, when they are detrimental to crop farming, is the belief that they are part of the natural hazards sent against them by God. New ones are also suspected of being imported with relief food from outside the country. These understandings are particular of the recently introduced parasitic

[60] Interview transcript

[61] Imported from Australia at the turn of the century, it has been the most widely grown and economically advantageous tree in Ethiopia today. Irrespective of its associated negative ecological impacts, well acknowledged by farmers and scholars, its status seems to be controversial. This is an interesting research topic both for social and natural scientists with immediate and desired policy and programmatic impacts. In this dissertation, the focus is on farmers' perception and utilization of this tree in relation to the rest of their resource use practices.

weed striga which has been a cause of severe sorghum yield reduction. In 1998, farmers I visited in Fädis district, east Ethiopia, complained so much about it and said its only solution was going to be the collective prayer, *wädağa.*

Compared to the scientific model, these categories might appear problematic. The natural versus human-made distinction is not an inherent feature of local conceptualization of environmental resources. For them, the dichotomy between humans and nature, more importantly, between "God-made" and "human-made" is superficial, irrelevant and alien. Accordingly, in the final analysis, the local perspective subsumes everything under the work of nature or God. Therefore, villagers finally tend to put every resource under one category which is natural. If not, they prefer to categorize those things to be called human-made as *"säw särraš - täfät'ïro"*, which means *"human-made-natural"* to keep them distinct from those 'naturally natural'. My landlord and field assistant, Yïmam, remarked, "*The bathroom [mine] we constructed today is human-made but we built it the day God wanted us to do it and at His discretion".*[62] In standard Amharic, the term *täfät'ïro* is given secular and direct meaning whereas in the local dialect it is accorded a religious and symbolic meaning. The official scientific definition of natural resources is yet a concept in the making largely because of government, mass media and NGO interventions.

Local perceptions of nature and natural resources might entice one to pose the question "is everything in nature a natural resource?" If we start from local religious understandings that everything in nature is made for the benefit of human beings, there is good reason to say so. Notwithstanding this, most of the villagers believe that such beasts as hyena and porcupines which destroy their field crops are not resources. In this regard, I have come across a minority who believed that even these animals are useful to humans. For instance, it was argued, the skins of hyenas could be worn as amulets to ward off witchcraft. Snakes eat field rats which also trouble humans. Finally, it should be noted that

[62] Field notes

the new concept of "human-made natural resources" is out of local epistemology. In a society where there is no need of separating things, events and processes as natural or human-made, it is naïve to believe that such a seemingly contradictory notion existed. Rather, it needs to be better understood as an effect of informants' reaction along the process of data collection in relation to an outsider-a researcher.

4.3.2 Anthropocentrism and Relativism in Resource Conception

Apart from being holistic as revealed above, the conception of resources in Gäddärro bear a number of other features. In here, we shall take a look at anthropocentrism as well as cultural, spatial and temporal relativism. We already mentioned their belief that everything God created is for the sake of humans. This belief instantly renders their conception and definition of resources quite anthropocentric. In this regard, what a farmer, Ibrahim, from Mïsïräta said is quite representative of the others as well:

> Livestock are useful because of their meat, milk and traction power. Soils are here so that we grow plants on them; the woods are for us to burn, to build our homes with. The stones are for us to build bunds and terraces with. Grasses are to be grazed by our animals and for us to cover the roof tops with. Rains are created so that we can grow our crops.[63]

The attitude that put the non-human components of the environment to the service of humans is quite pervasive.

The concept of cultural relativism is also an aspect of their resource perception. A new knowledge building recently at local level is that: if something is not useful in one place, it is in others. That some people have left as useless; others extol and use it as an important resource. These people are also aware that wild animals not eaten in Ethiopia are eaten in other parts of the world. Accordingly, the belief that there is nothing that is useless to humans from among all that God has created is emerging. In this regard, Assäffa, a man from Mïsïräta, remarked,

[63] Interview transcript

For instance, the ants keep the larvae of the caterpillars away. Termites keep off snakes and rats. In the old times, hyenas and horses used to be eaten; but [later] the *Kitab* [the Quran] made restriction on that. Porcupines are very destructive to our crops but their parts are very useful in protecting children from the evil eye.[64]

A woman called Anša from the same village, a returnee from resettlement to Gambella, recalled that nearly all creatures were eaten by their hosts there. As such, experiences of the external world are employed to support the religious thinking that everything on earth was created to the service of humans.

The cultural relativist concept is even wider. Some of my informants claimed even wild animals could be tamed if they were made to. Others doubted this because God has made them wild from the beginning. The former referred to the monkeys and the lions tamed in some show centers in urban areas to convince others that it was possible to tame wild animals. In a group discussion in Mïsïräta, Assäffa argued: "If you insult a hyena, it will harbor grudge and be vindictive. If you beg a threatening leopard, it won't attack you. This is a testimony that wild animals could be tamed."[65] Of course, the center of this argument was not if wild beasts were to be tamed or not, but that by taming, they could be turned useful to humans. Such and other instances to be treated in this dissertation depict the influence of externalities on knowledge and beliefs of traditional people. Agricultural extension education, radios, especially for men, and exposure to the outside world such as resettling into far regions as in the case of the woman quoted above, have been influencing TEK and beliefs among these communities.

Time is also of essence in notions and definitions of resources. A small thatched house known as *däräba* and normally used as storehouse for forage was used as the feed itself during scarcity of livestock feed in the drought of *bïllagi* of 2008. Old thatches, removed from demolished houses, blackened and weakened by several years of smoking and weather, nevertheless turned to be important

[64] Field notes
[65] Interview transcript

sources of feed during this drought moment. At that time, most of all, trees, shrubs and other bioms, otherwise less valued or considered non-edible, were in their ever most demand in the desperate hunt for anything forage. Accordingly, farmers changed their cognitive schema of resource as a livestock feed. Forage, in short, became something to be contrived. As Squires maintained (2004), in this case as well, "nothing physically or objectively changed" with the plants that were used as emergency feed but the desperate need of stock raisers for feed. Similarly, hunger forced the animals to feed on everything given, even what used to be rebuff. In this case, the same notion applied by Squires for humans could also be extended to animals. This drought rendered more than 6 million Ethiopians in want of immediate food aid, and all the 25 villages of Gäddärro FA were affected.

Among others, the notion of time is also equally applicable in terms of valuing food. As in everywhere, a food that is less valued during good times is highly craved for during lean moments. Memorizing the deadly 1984-5 famine, local residents recalled the famous saying, *"Time eats, not humans".*[66] This was said to be a reaction made by a man who survived that notorious famine on very poor food but was very critical of better food served to him by his wife in good time after the famine passed. This is quite comparable to the saying: "away with recipes in books, hunger is the best of cooks." This is a rather universal truth with perhaps a deeper, philosophical meaning about humans' relation to their environment as a source of food. Such instances suppress the influence of culture in the food selection behavior and reduce every one of us into the basic, biological need satisfaction.

[66] This is a saying reportedly made by a farmer whose wife was challenging his refusal to eat a home-made bread during a normal time in one of the nearby villages. The couple slightly survived the notorious 1984/85 Ethiopian famine which claimed the lives of more than one million people. The woman was challenging her husband that she had seen him eating very well a bread made from very poor material during the famine and had no reason objecting to the better food which she served him many years afterwards. To the challenge "I have seen you eat even that bad breadœ the husband reportedly said, "Do you really think I eat that food for you; it was time that eat the food for you."

4.3.3 Local Environmental Change, Degradation and Resource Conception

The second half of the 19th century is regarded by the elderly (at least theoretically) as a period of the basic environment (climax environment) in Gäddärro. That was the time during which their great grandparents moved onto this place. There was no one inhabiting that land at that period even though this does not necessarily obviate the possible occupation of the place in the remote past. Given the relative abundance of the resources at that time such as land and trees, many regard this to be the beginning of "the good olden days" in their local environmental history. Today, their perception is that there is no land that has never been touched by humans. In absolute terms, even the land called *ïddari* (virgin land) never existed. (See Chapter Six for a schematic representation of this notion). In actuality, in their religion, it is said that changing the earth and degrading it started with the first farmer on earth, Adam, who kept on increasing the land he plowed every year, but who, on the contrary, found his harvest decreasing every year. What is more, it is nearly common knowledge that the environment changes even without humans' intervention. This is in line with scientific observation made by many scholars (e.g. Balee 1998; Blaikie and Brookfield 1987). Heavy rain can expose land to denudation, especially on hilly areas as experienced in Gäddärro. It is also believed that *bärgäg*[67] (thunderstorm) can denude the land. This was used by villagers to explain the ubiquitous problem of denudation during the heavy rains of *kïrämït* of 2007. Very high slopes expose whatever small soil is available to water and wind erosion *(albolboiti*), though the latter is more of a feature of lowlands. Blaikie and Brookfield have employed the term sensitivity to refer to such a characterization of land degradation based on bio-physical features (1987, pp. 10-13).

[67] There are farmers who put leftover bones from animals killed on special religious feasts onto their fields in order to prevent thunderstorm from kicking their land. It is believed these bones keep off the Jinn from seeking refuge in their fields, against which thunderstorms are directed.

We have already seen that according to local perception, the size of a space could reduce as the earth sinks or shrinks because of soil erosion.[68] Several farmers tried to describe how the land that was before 30 or 40 years changed so much. In this process, among others, farm fields with a swelling out topography before some 30-40 years are said to have developed folds and raptures because of soil erosion and sinking land, also affecting their spread. Some local specialists believe that the land that was a depression once could have been a hill or mountain after several thousand years. Pointing down across the mountain we were on towards the lowland villages of K'ärsa and Mïsgida, my key informant from K'ädida, Mäğän Gutu, once said that the lowland parts of Gäddärro FA could be upland after several thousand years whereas the upland we were on, overhanging these villages, could be lowland. This evolutionary perception is there, though it might not be shared by a great number of villagers. In this regard, my informant runs against the premise of historical ecology (e.g. Balee, 1998) that the principal causes of changes in human-environment relations result from historical and not evolutionary processes. Local knowledge in general is that both local and global environments are in continual flux, rather than in a static condition. This perceptual understanding is reflected throughout the analysis of the rest of this dissertation.

It is also suggested that this change could be observable or subtle, quick or very gradual. Their perception of change in terms of time span could be categorized as evolutionary, revolutionary and something that lies between the two. Evolutionary changes, as suggested by this informant, might not be perceptible for several hundred generations of human beings. They are very, very gradual. Within just three or so decades the population of Ethiopia has boomed in the demographic history of this country. This is reflected in the local demographic history of Gäddärro as well. What is more, pre-emptive tree-cutting of the 1974 and 1991 brought the remaining vegetated land of Gäddärro and the country at

[68] In this line of perception, soil erosion is seen as a process shrinking the earth which has been spread by God.

large, to a very extremely lower level just within a matter of a few days or months. Such fast environmental changes, also documented in another FA called Maybar in South Wello (Tesfaye, 2003), taking place within short periods, perhaps extending to some years, could repeat a number of times even in one person's life time. I call such changes revolutionary. What I called something lying between the two refers to changes that take place over a short period of time (e.g. ranging from one to several generations). The analysis of environmental change and degradation, which is the subject of this research, has employed oral materials (and some written) dating as far back as the second half of the 19th century. What has happened between then and now could be understood in light of this analysis. This theorizing (modeling) of change in environmental change perception is not my own abstraction. Local environmental experts have repeatedly employed it in their attempts reconstructing, explaining and teaching their environmental history to me.

As already discussed, the environment is generally conceived as undergoing change due to natural and human agencies. The belief is that human agency is rarely neutral. It always causes some kind of effect on the environment even though it does not necessarily degrade it. An over-cultivated, impoverished piece of land for instance, could be reinstated into the best fertile land if reconditioned or left fallow adequately. Dense thickets or patches of forests cleared in the past by their forbears, in order to carve out a farmland or a space for residence, resulted in environmental changes. Tree planting done for decades has positively affected these places at later dates. The farmers of Gäddärro represent their environmental relations and environmental changes in their lore. I would like to complete this section with such a representation.

It was said that, once, animals and gray hair file complaints to God over humans' mistreatment of their common environment, rendering their survival one of misery. The narrative was retold in the context of land degradation and ecological disturbance because of the overstepping behaviors of human beings

in relation to other living creatures. The major theme of the lore was that harmony among the different living creatures of the ecological system was to be achieved only if humans were to show restraint from passing their limit to affect others' share. In this line of ecocentric understanding (Cf. Squires, 2004), the lore is represented here in order to highlight farmers' perception of the impact of the human agency on the natural environment. It goes like this as it was narrated by one of my key informants, Bäkkär Sämman, from Awraççа, amidst a small crowd of men:

> The hills used to be the grazing land for the livestock. Thus, they were not cultivated; the trees and bushes on them were not cleared either. Once, an animal appeared before God; identified itself as an ox and lamented: 'They had me plow all the plains, the terraces and even the hills. That left after me was dug by *däŋgora* and *doma* [digging tools], even the field margins I used to graze. Then, where else could I eat?' Upon hearing this, God asks, 'Did they plow the margins you used to graze? 'Yes'. 'Did they deprive you of any place to graze? 'Yes'. 'Then, I have put your *ïrzïk* [feed] on the shoulders of your owner. Let him sweat to feed you where you stand. Be aware, your *ïrzïk'* shall not be discontinued. Let your owner take the trouble to fetch your feed wherever he finds it.' Next, the Jinn came forward and yelled, 'They cleared all the *wurma* and the *waššа* [the bushes] I used to live in. Then, where else shall I take home?' God asks, 'Did they clear your *wurma*? 'Yes'. 'If they did so and refuse to stop; then get your way on the *gofla* [shoulders] of every woman and man. Sit there for good and set one against the other.' What did the hyena say, 'They cleared my *dawwa* and *wurma* [the bushes]. I cannot find a space any longer; where shall I take to?' God replies, 'I have made your den every plain land available. I have made the open field a *wurma* for you. Let you not be seen in daylight'. Finally, what did gray hair say? 'I cannot find old people any longer [they die very young]; where shall I grow on? The older people are all dead.' Upon hearing this, God instructs, 'then, go grow on the head of every small child you find'.[69]

The narrative was followed by local interpretations. Specifically, it reemphasizes the ecological relations and responsibilities between humans and the flora and fauna in their environment. The religious provision that everything on earth was made to the service of humans seems to be challenged by this lore. Even the Jinn, an otherwise most hated and feared bad physico-spiritual thing, has its due share in this world. In local view, the Jinn are autochthonous to the land, created before humans. At the empirical level, the land degradation that has been experienced over the years and the recent ban on free grazing and the

[69] Field notes

rush of farmers to cut and carry feed for their animals, are represented in this lore. In the past, there was no significant custom of carrying animal feed home. Animals were let out, just grazed and driven home. There was no need to buy forage, stalks and hays like now, either. On the social side, the present-day lack of peace and stability in marriage is religiously interpreted as resulting from the evil work of the Jinn. This social problem, however, is given an ecological base, epitomizing the impact of the physical environment on socio-cultural change. Environmental problems are re-projected as socio-cultural problems.

It is said that nowadays, the hyenas just hide even in small hedges around villages because this animal was blessed by the former sheiks to do so. Re-vegetating landscapes in some of the villages I studied have already been a cause of concern for villagers as beasts seek refuge in theme to damage crop fields, livestock and even threaten human beings. As Mesfin noted in general, the spatial competition between humans and other components of the environment in "the struggle for existence" is reflected here as well (Mesfin, 1991). It is also suggested in the lore that humans will face more trouble, the more they degrade their environment. Therefore, there is an implicit advice that humans should refrain from doing so, also leaving the due share to the rest of the animal kingdom. Following Tucker and Grim (2001), this could be part of the hope that humans still need to seek in religions (traditional belief systems as well) despite their provisions that have encouraged natural resource over-exploitation and destruction of ecosystems.

The lore synthesizes the interrelationship of the social, the cultural, the ecological and the biological in an environment as a shared ecosystem (Ellen, 1982; Turner, 1985). As stated by Ellen, it also supports the notion that "culture has to be seen as processual" and "interactive" which "imposes meaning on the biotic and ecological systems" (1982, pp. 153-4). The interpretive nature of religions about humans, their origin, nature and their destination as envisaged by Tucker and Grim (2001), is also revealed in line with what is also said by

one of my informants from Kibi Méda, "Religion is for us what science is for you [the educated]".[70] As already stated, if not instructive, the lore is suggestive, of what humans should do in relation to their environment and the rest of the animals. It is suggested that humans refrain from their irresponsible behaviour of excessive, preemptive and degenerative use of resources, mainly symbolized in bushes or forests. If not, the implicit message is that there will come more danger. This verifies the generalization "Religions also suggest how we should treat other humans and how we should relate to nature" (Tucker and Grim, 2001, p. xvi). Added to this, that these smallholders (or humanity at large by extension) are suffering from their past environmental mistakes is presented as a rather clear message. The role of belief systems in the conception of environmental resources and their problematization is further discussed in the next section with specific reference to two droughts/famines.

4.3.4 The *"Däwla"* in Resource Conception: The spiritualization of time

It is already clear that a spiritual understanding of the environment is pervasive among the communities in which I worked. While this remains to be one of the angles from which I have approached my data and their analysis in this dissertation, for the moment, I restrict my analysis to one strand of this spiritual dimension in order to highlight how local resource perceptions and interpretations are informed or potentially influenced by religion. In so doing, I shall further restrict myself to the memories of the 1973-4 famine and the experiences of the drought and food shortage of *bïllagi* of 2008.

Among the animals reared, cattle were the most affected due to the 2008 drought of *bïllagi*. During this moment, I had my first ever experience of witnessing animals shrink in front of me; decimated to the extent of losing energy to carry them.[71] In such a condition, it was obvious that these farmers

[70] Field notes

[71] It was during this time that I had experienced well the sense of human-animal relationship in the field, even though I was by no means new to this experience given my childhood upbringing. The animas of my landlord, tethered in their feeding stall, right in front of the

were very conscious of the bio-physical problem of lack of forage. The interesting thing, however, was that their reasoning was not based just on the basic premise of lack of rain and the consequential non-sprout of grasses and other vegetative cover to be served for animals. It was not just about lack of water either, as the streams and the hand-dug wells were nearly dry. The answer to this takes us to the difficult notion of *däwla*.

Villagers believed the *däwla* had its own role to exacerbate the effects of the drought. The *däwla*[72], linguistically termed as such in the local dialect, refers to *'the wind'*, termed *nïfas* in standard Amharic and the local dialect as well. Hence, the *däwla* might seem to be the abiotic wind. Nonetheless, it is not just an abiotic wind that simply blows. Rather, it is a *spirited wind*, receiving its power from the spirits that affect life on this earth. In the case of *bïllagi* of 2008, unlike the 1973-4 drought/famine, it was said, the *däwla* turned its back on the animals. As I also observed, farmers still managed to fend for their starving animals whatever was got to hand, spending in hundreds for feed purchase and transportation. The moment had been described as one in which animal feed was most commoditized, fetched the most soaring prices and farmers spent huge amount of money to save their animals. Many complained if an animal was given a good size of feed, the owner will have it beg for more just within a moment. It was believed that the *däwla* plundered the *bäräka*, (blessing, real value) of the feed consumed. In this regard, the *däwla* intervenes in the natural flow of resources from the plants to the livestock as stipulated in Suzuki's energy pathways (as cited in Babe, 1997).

Materially, in the drought of *bïllagi* 2008, the situation for human beings was said not to have been better. People had to carry out many kinds of coping

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entrance to my room, have been there for some months. It was only during this moment when many animals were dead because of lack of feed and those surviving were feeding anything given them that I practically experienced the pain of my informants described to me in the field. I had these animals cry and sneak towards me in search of something to be thrown to them, even when I was entering the compound by myself without my landlord and field assistant accompanying me, who owned these animals.

[72] This term is not found in the vocabulary of standard Amharic.

mechanisms. Of course, this was the moment I saw and heard many villagers seek credit from their better-off neighbors and relatives. Many households shifted institutional credit for purchase of survival food. Many people who did not secure enough food later relied on emergency relief assistance. Regardless, the *däwla* was conceived of as the kindest of all. What was happening was told as the exact reverse of the 1973-4. Then, it was remembered; a person who ate full *ïnğära* (traditional bread) felt hunger just within a moment. On the contrary, in 2008, the same food eaten by four people was enough to prevent hunger for long. In local interpretation, all this difference was attributed to the effect of the *däwla*. The *däwla*, in both cases, was represented as spiritual stressor and optimizer of resources.

Perhaps, this apparently spiritual explanation might have physiological and biological bases. From the vantage point of cultural perception, it is clear that these farming communities have valued their resources in one important frame of understanding. We also learn how complex and diverse the cultural meanings of food, eating and starving are. We also realize that without ferreting into these deeper meanings, it is difficult to achieve a full local comprehension of the occurrences of such problems as drought and famine. The famous local adage already quoted, *"time, not humans eat"* was based on historical experience of yet, another famished interlude in the 1984-5. This saying comes as a clear epitome of how the conceptualization of resources and resource use is bound with the conceptualization of time as well. As an interpretation, the *däwla* has not yet been the interest of the scientific model. The *däwla* appears to be a concept between the physical and the spiritual. Leaving this topic here, I now take to another religious notion my field partners were trying to employ analyzing their relations to their natural resources.

4.3.5 The Religious Notion of *Wağib* in Resource Conception

Tradition, religion and the state are among the important factors that shape and reshape farming communities' environmental ethics across time and space. While I will consider TEK and WSK in the forthcoming chapters, here I consider religion and environmental ethics. It is already established that these farming communities believe that everything on earth comes next to human beings. One gets a mixed response in answer to whether God, in return, has made a requirement on humans for the things they make use of in nature. This adds up to the already mentioned finding that their view of nature is becoming more of anthropocentric. In reference to animals and plants, Anša from Mïsïräta, the woman I already quoted, remarked: "God wants us to feed and care for the domestic animals; the wild ones are fed by Him. Those trees we plant and grow, we protect them. Wild trees grow by themselves; there is nothing that we do for them. We put manures on the soils and construct such structures as bunds because they are useful to us".[73]

In their religion, Islam, the notion of *wağib* refers to permissive (prescriptive) human behaviors in relation to other humans and the rest of the world. Assäffa, whom I have earlier quoted, said, "In the *Kitab*, a woman should fulfill the *wağib* of her husband, and he should do the same. Failure to fulfill this religious obligation is a *déyn* that is a sin questionable on the day of the *K'uiama* [The Final Day]."[74] Men of religious knowledge stated that the provision also applies to one's children and livestock. Extending the *wağib* concept to natural resource management, many ethical issues were redrawn.

[73] Field notes
[74] Field notes

Table 3: Some aspects of the wağib notion as applied in agriculture and human-environment relations

The *wağib* humans should fulfill for the land	**The *wağib* humans should fulfill for the livestock**
Tilling the land and getting benefit out of it	Feeding and watering them on time
Building bunds and other structures in order to protect the soil from erosion	Treating when they fall sick
Applying manure and the like fertility enhancement measures	Keeping them in shades, protecting them from rain and other climatic vagaries
Planting on time when the rains come and weeding the field crops	
Not pushing into the boundaries of others; those who do so will not even have their alms accepted before God	Cleaning their waste from their sleeping places; protecting them from sleeping on dumps
Paying the land it's *Zäkka*[75], that is giving a tenth of the harvest to orphans and the poor	

There is disagreement on the *wağib* that humans should fulfill to trees or plants. The natural-human-made conceptual disagreement already discussed in this chapter is reflected here again. This was the idea that considered trees as natural and human-made and that which ultimately considered them as natural. In line with the idea conveyed above, by the woman Anša, there are villagers who reason that "human-made" trees such as eucalyptus, coffee and orange need to be planted, weeded, and protected in order to grow and give harvest. Thus, it was argued, these trees deserved *wağib.* On the contrary, the rest of the trees that is indigenous trees such as olive trees, meaning those germinating and growing by themselves, which is to mean naturally, were withheld from

[75] This is Alms or Alms giving, one of the five pillars of Islam. There is a local myth told around the emergence of paying *Zäkha*. The belief is that when *Zäkha* is fulfilled in the name of land, the land will get appeased. When the land is appeased as such, it will give good harvest to the farmers fulfilling this religious requirement. Therefore, *Zäkha* is to be paid in the belief that God has ordered them to pay land its due. (There will be more about this in the discussion of land as a resource in Chapter Six).

enjoying the *wağib* benefit. These trees are also called *wäf arraš*[76]. Some of my field partners wondered, "How come we could take care of these trees that are growing everywhere in plenty?"[77] Hence, it was argued there was no such a religious provision ordering that they be cared for by humans. Declaring that these trees do not have *wağib*, some protested let them grow by themselves everywhere as they have been doing in the past. Just some of the villagers I interviewed wished if these indigenous trees had *wağib* and were to be protected. They were suggesting that these species were endangered by lack of human care and protection.

Those who are on the other side, maintained that every plant wanted to be protected. To this effect, it was argued that they have got hill lands suitable for trees on which indigenous trees were protected and growing. The old man, Ayyälä, from Awraççа, argued, for instance, animals are not let to mutilate these trees and care is taken not to damage the tender ones when cutting grasses. According to this person, even though those trees were *wäf arraš*, their survival and growth was contingent on protection from animals. Hence, all trees and plants needed the proper care and protection of humans. Nonetheless, all admitted that in practice, care is made only to those planted by them. As my observation goes, this is primarily done for those planted on their private holdings. The majority perception was that there was nothing conscious and purposeful done to keep indigenous trees until their planting by humans recently.

This lack of fulfilling the environmental *wağib* is said to be a long standing problem. Now, it is understood that unlike in the past, these resources need to be protected if they are to survive. It is believed that there are more people now than what the land could support. This thought was however subject to internal criticism. Assäffa from Mïsïräta, already quoted above, was quite critical of his

[76] This refers to any plant germinating naturally without direct, conscious human intervention. Generally, the term refers to the indigenous trees which germinate and grow without the care and protection of humans, which they do not demand according to some view.
[77] Interview transcript

own society: “Name those animals that bite and that eat, it is only government and God that have got pity on them. The people here never care if they were to perish at all.”[78] The same spirit was conveyed by my assistant, Yïmam, from the same village: “As for the wild animals the government needs them, if we do not. Now, there is a prohibition on hunting even a hyena. They need these wild animals for the pictures, for their drawings. Ivory is in high demand for making ornaments”.[79]

The notion of *wağib* was raised in some of the discussions on the ‘dos’ and ‘don’ts’ of resource use. As might be sensed from the discussion, the concept was applied as a way of justifying past behavior more than rectifying future practices. I have heard some people preventing the felling of very young trees on account of seeing it as an act of sin. Mistreating livestock, as in keeping them long without watering, is also considered in the same manner. While such cultural elements encourage that this aspect of their religion is potentially useful (Cf. Tucker and Grim, 2001) to improve human-environment relation, including the moral obligation famers should have for the resources around them, currently it is short of influencing their behaviour.

4.4 The Cultural Understanding of Agriculture and Its Potential Behavioral Effects

4.4.1 Origin Myth of Agriculture

According to the elderly, the original form of agriculture in the world was carried out by cultivating land with small wooden tools. The first crop to be planted thus was said to be wheat. It is believed that the seeds of the wheat crops fell down from a trey onto earth as the *Mäläika* (Angeles) were preparing their food in the skies. After that, it is believed, the rest of the crop varieties were invented (domesticated) and diffused by humans from one place to the other. It is also believed that the first farmers and their descendents for a long

[78] Field notes
[79] Field notes

time threshed their crops not as done now on ground with implements and livestock, but simply by means of crushing them between their palms. Through time, it is understood, threshing on ground was invented but such crops as barley and oats were threshed together for a quite long time. These crops were also used to be kept in a pit together. After the domestication of crops, it is believed, humans started domesticating and rearing animals as well. According to my key informant from Awraççа, Bäkär Sämman, cattle were domesticated (created to repeat my informants' term) from an animal called *hérädida*.[80] Such evolutionary outlooks exist with respect to other aspects of the environment as well. Change in environmental relations as a continuous process is once more reflected in local perception of agricultural evolution. These views compare with modern evolutionary thoughts. Crops were made from plants and livestock from wild animals.

It is also believed that the remote ancestors never worried for rains, for land and for soil. Concern for the upkeep of these resources is considered as a recent phenomenon, which is also related to the continuous change of the environment. Although, as already said, these farmers do not necessarily correlate change with degradation, most of the lore is about this. Let us see a lore narrating as to how the practice of weeding field crops was accidentally invented by a woman. It is told that once upon a time, as elders were arbitrating a married couple sitting in crop fields, the woman was unconsciously engaged in removing some plants from the field crops, while attending the arbitration. The crops in this part of the field did very well and it was learnt that the woman was the reason behind that. Others emulated the practice which later became to be known as weeding, to get good harvest. Before that, it was said, there was no weeding and people simply harvested what was planted. Men kid that a woman was

[80] Informants I talked to did not know what type of beast this word exactly stood for. The term is also not known to standard Amharic. Probably it is a corrupt form of the Oromo word *harré dida* which means wild ass. The important thing is that they have the evolutionary perception that livestock are domesticated from wild animals.

responsible for inventing the tedious burden of weeding on them. Even today, women's role in weeding is more important than men's.[81] The need to weed is interpreted as a sign of reduction in the quality of the soil.

The accidental behavior of the mythic woman could be an epitome that the basic, abundant environmental resources, symbolized by soil, needed some form of human intervention to yield more, long before the problem was consciously perceived. The need to increase the resilience of resources as understood by Blaikie and Brookfield (1987) is also understood in the context of this TEK. It may well suggest that environmental degradation started way back even during the good olden days against what is commonly believed to be. The mythic woman is represented as an innovator, and by implication, the men as adopters of innovation. This recaptures the lived experience of most of the womenfolk in agricultural communities in Gäddärro and perhaps many other parts of Ethiopia. Though the myth does not necessarily correlate agriculture with environmental degradation, it goes with farmers' knowledge that agriculture is an extractive mode of food getting as far as the use of natural resources is concerned. This is also in line with the intentions and development of this research. The positive aspect of human agency reflected in the environmental behavior of this woman is in a way supportive of the thesis that unconscious thoughts and behaviors are necessary for the sustainable use and protection of environmental resources.

4.4.2 Agriculture in Traditionalist and Modernist Mindsets

Throughout history, agriculture for the people of Gäddärro has remained an economic means and a way of life as stated by McCann for rural communities in the adjacent province of Shoa (McCann, 1988). As an economic means, their livelihood has been hanging on mixed crop-livestock production. As a way of life, it has been interconnected and interwoven with kinship, marriage, politics, religion and spirituality. Technologically, agriculture has been relying on local

[81] This means that women are faster than men because of figure dexterity. As some farmers told me, this is also likely to be related with the condition that weeding for men involves pressing the testicles as they had to squat and move in the weeding process.

technical know-how and belief, mostly transmitted from generation to generation.

Contrary to this perspective, the modernist mindset (in the case of Gäddärro, and of course, the rest of Ethiopia) has been introduced by Ethiopian states, western governments and later, NGOs, to improve agricultural production in the country. The state way (emanating from the developed world)- even though different states have adopted different strategies at different times- has generally remained the same in essence. The domination of WSK over TEK, beliefs and techniques has always been their common feature over the years. Development programs and their concepts such as "community participation" and "sustainability" (of the NGO era) have in practice brought little difference in terms of considering TEK as a supplement to WSK. Therefore, both ideologically and technologically, over the last half century, agriculture in Ethiopia has been a field in which the two models competed, intersected and largely overwhelmed each other through a long process of farmers-environment-state interaction. Therefore, among the Gäddärro smallholders, agriculture in the traditionalist mindset and agriculture in the modernist mindset, generally speaking, form two broad categories of agriculture. Both categories have their own philosophies, ethics, principles and methods of agrarian resource use.

There is no local term specifically used to describe the concept what I have called "agriculture in traditionalist mindset". The qualifier *abbat addär*, meaning *traditional*, is locally applied in reference to all traditional things, events and processes. In this regard, the term *abbat addär* could also be used in reference to this concept. On the other hand, the term *"gïbrïnna",* which means farming or agriculture in the official parlance, is applied by villagers to refer to the concept I called agriculture in "modernist mindset". This term is actually applied in the nomenclature of the Ministry responsible for agricultural activities and all its structures extending down to district and villages. *Gïbrïnna*,

as a practice is traditional but as a state institution it is modern. Villagers apply the term as shorthand for all state institutions responsible for agricultural development, from national to local levels. The term *gäbäré* refers to a smallholder both in local and official parlance but the term *araš* is quite older in reference to a smallholder and the term *ïrïša* in reference to land operated by smallholders. And the first ministry responsible for agriculture was called *Ïrša Ministér* without bearing the term *gïbrïnna*, which later nomenclatures do.

In villagers' evaluation of agricultural principles and practices, the two models have their distinctive characteristics. The ongoing shift from the first to the second model is treated locally as part of the sociocultural changes that have been undergoing over the last half century. This ongoing change has practically affected smallholders' relationship with their natural environment both in negative and positive ways. These models could be grasped as the representation of the dynamics and interaction between TEK and WSK taking place within these communities. Summaries of the two models of agriculture are given below.

Table 4: Summary of characteristic features of agriculture in traditionalist and modernist mind sets

Traditionalist mindset	***Modernist mindset***
Task over which the individual farmer has full control	Task over which individual farmer's control is contested by external agents, especially state officials and experts
Task towards whose fulfillment traditional organizations, networks and institutions are constantly called upon	An intensive method of food production yet largely under-subsistence
Task for which mutual cooperation, trust and transparency among farmers set the rules or procedures to promote cooperation and discourage competition among individual farmers	Spatial integration between crops and the rest of the plants
Spatial separation between crops and the rest of the plants	Religion, myth and ritual playing no part in farmer's destiny
A progressively extensive method of food production	Environmental depletion, degradation and deterioration primarily seen as resulting from natural forces, over population, backward agricultural practices, farmers' impermeability to modern technology and innovation as well as scientific extension advices
Environmental depletion, degradation and deterioration not perceived well and when so primarily seen as a function of divine retribution anger of ancestral spirits or pious individuals	Farmers generally considered as non-experimental and uncritical of state officials and experts ideal rules, procedures and techniques of modern agricultural practices and its organization
Religion, myth and ritual playing part in farmer' destiny	Inherently closed for a two-way transfer of learning

Experts, policymakers, administrators and 'developers' render no or the least recognition to traditional knowledge and skills. Farmers, on their part, value their age-old experiential knowledge. From the numerous observations and discussions I had, farmers needed the help of experts when local knowledge and skills failed to solve their problems any more. In the face of this, however, it is believed that they live in an ideological framework in which they had to work in collaboration with government experts, officials and policies.

4.5 Conclusion

The concept of the environment as "that which surrounds us" (e.g. Ingold, 2000; Ittelson et al., 1976; Kates, 1976) is part of local understanding of the bio-physical and the social environment. The chapter has discussed that local

perceptions of the environment, as well as its constraints and affordances of the environment are explained both religiously and secularly. The village is perceived as the hub of local cosmology of space or human-environment relations. Whereas the immediate environment is still perceived as being one of the best agro-ecologies, local knowledge also abounds with the different resource degradation and environmental risks affecting agriculture and, thus, local socioeconomy. As such, the homeland is represented as a good place to live in and as a bad place to be done away with. This is however largely theoretical as nearly all of the older generations had to struggle for survival amidst the opportunities and challenges of their immediate environment. Rain is specifically regarded as the source of the entire ecosystem. Local understanding is that if there is rain, then there is everything. If there is good rain, crops and livestock thrive well, unless such environmental risks as pests and diseases crop up. Therefore, the presence or absence of ambient natural conditions for farming is one of the major conditions for success or failure in agriculture. Hard work is appreciated but it does not necessarily result in success; not because of material or technical issues but because of religious and ecological factors. Assistance from the state (and the international community) in the forms of relief as well as development aid, is another important factor in which the homeland is judged as a good place to live in or not based on their *abïll-asïll* concept. Kates' observation that "How we choose to emphasize the environment-as nurture, haven, or home; as deprivation or stimulation to the sense; as myth or symbol; or as threat and hazard-is partly the essence of the conference" (1976: 133) is well reflected in the ways these smallholders perceive, understand and represent their environment and its different components.

This chapter has also explored local perceptions of environmental change and degradation. Even though it is not necessarily the case that all changes and degrading processes are perceived, the environment is understood to have been in a continual process of change since creation. Humans are held

responsible for this but are not necessarily considered to be degenerative to the environment. Nonetheless, there is good level of awareness that humans had affected their environment by excessively charging such natural resources as land, soil and trees. Such knowledge, well incorporated into their beliefs, suggest that there shall be more environmental problems to come, unless restraint is to be made on the part of humans degrading the environment.

Further to this, the chapter has discussed that local understandings of the environment and its resources and constraints are contingent on a number of factors; and have been evolving through time. Hope, despair, love, awe, fear and faith dominate their environmental perception and behaviors while living on their land. In this process, these communities are also on a gradual shift of understanding from a holistic to a dichotomized nature and culture/society. In this regard, the chapter has revealed that the attitude of holding nature and culture in unison does not necessarily guarantee environmentally friendly resource use practices. And dichotomizing the two does not necessarily encourage environmental degradation, either. It also has shown the two attitudes could co-exist in a society at a time. With seeds of changes originating from within and from without, there has been a trend of interacting with the land not on the basis of religious projection alone but also on that of economic, secular and scientific reasoning. Of course, the current case is one in which farmers' perceived society and nature both as unitary and at the same time contradictory, with the result that nature is more exploited finally. Pálsson noted "It seems reasonable to assume that humans are simultaneously part of nature and society and that modern policy on the environment should be based on that premise and not on the idea that humanity, or some part of it, suspended above nature (2006, p. 74)". This perspective is just partially supported among the research communities.

The culture of holding humanity and nature together and then separating them seems to be an evolutionary process to humanity at large. In light of this, it

seems there is some sense of the 'psychic unity of human-kind'. Pálsson's remark is quite illustrative of this. She wrote, "Before the advent of modernism, there was no radical separation of nature and society in European thought. People saw themselves as integral parts of the world, embodied in nature (2006, p. 73)". She added, "In a brief period, nature became a quantifiable, three dimensional universe appropriated by humans. This universe represented a radical departure from the earlier, enclosed universe of the Aristotelians constituted by the earth and its seven surrounding spheres (Pálsson, 2006, p. 73)". As already mentioned however the culture of holding society and nature as an integral whole is necessary but not sufficient to prevent the natural environment from degrading.

This and the forgoing chapters have laid down the theoretical, conceptual and historical background for the rest of the dissertation. Each of the following chapters spring from and expand on the major issues briefly considered in this chapter. Therefore, the chapter serves as introducing the basic contents and themes of the dissertation. The next chapter reviews the land tenure systems of the research communities and the country at large, with the view of studying their sociocultural, economic and ecological impacts.

CHAPTER FIVE: LAND TENURE AND LOCAL SOCIO-ECOLOGICAL DYNAMICS

5.1 Introduction

This chapter reviews and discusses the history of systems of land administration and use in Ethiopia in general and those of the research communities in particular. In so doing, it furnishes the political economic background against which current and contemporary land resource management or mismanagement could be understood over time. Thus, it should be made clear that the chapter is not about land tenure as such. Rather, its objective is focused on the impacts and implications of land tenure on smallholders' use or misuse of natural resources and social relations. Different political systems have employed land tenure systems as befits their ideological interests. Even though there had been differences between provinces and districts, land tenure systems have been employed to ensure and sustain the political domination of provincial leaders, emperors and state leaderships at large. Reviewing the major aspects of the land administration systems of four regimes, including the current government, the chapter concludes that state concern with the management of land and land-based resources has increased with time to the present in which land use plans are being developed for the first time in the history of the country.

Studies of systems of rural land administration have consumed the efforts of a great many Ethiopian and non-Ethiopian scholars since the second half of the 20th century (e.g. Dessalegn, 1991, 1996; Hoben, 1973; Lapiso, 1978; Mesfin, 1986). The majority of such studies focused on the political economic aspects of rural land ownership and the exploitation of the peasantry by the ruling classes and incumbent governments. This chapter adds nature as an important factor in this analysis based on the approach of political ecology (Biersack, 2006; Dessalegn, 1991; Greenberg, 2006; Kottak, 2006; Mesfin, 1986). On top of re-scrutinizing this aspect at the community level, the chapter adds to

the descriptive knowledge that has been accumulated thus far. To some extent, the ongoing debate about state versus private ownership of rural land in Ethiopia is considered. As such, in addition to summarizing and discussing the recent land tenure systems of the country, with a focus on smallholder-state interaction and the generation of additional knowledge, the chapter serves as a basis for the forthcoming chapters of the dissertation. The chapter also considers the impact of the international political systems on land administration and resource use practices.

5.2 Land Tenure in Ethiopia

> There is hardly any field in which so much confusion persists so obstinately as that of land tenure in Ethiopian tradition. Even the word itself is misleading: rather than tenure, it would be more correct to speak about access to land. Land holding practice changed over time, and tremendous variations can be observed not only in different regions, but even within the same village and family. Most confusing of all is the social dimension of conceptions about rights to land: a nobleman may have conceptions of his rights to the land which are completely different from those of "his" peasants. Moreover, urban viewpoints on rights over land are often completely different from the rural viewpoint. (Pausewang 1990: 38)

The systems exhibited differences among provinces, sub-provinces, and districts and, as Pausewang noted, even in a village, rendering coherent study quite a challenge. In spite of that, there seems to be a general agreement that the northern part of the country depended largely on a descent-based system known as *rïst* whereas the southern part was largely under the *gult* (cultivators serving as tenants*)* system until the 1975 land reform (Clay and Holcomb, 1986). This should not mean *gult* did not exist in the north and *rïst* in the south as the landlords, at some stage, were able to convince Emperor Haile Sellassie I to convert their *gult* ('fief' or 'fief holding rights') into hereditary rights (Pausewang, 1990: 43). Hence, during his regime, a new form of tenure called *rïstä-gult* (hereditary *gult* rights) became the norm in the south, exacerbating land expropriation and peasant exploitation. *Rïstä-gult* also

existed in the north though it was not as dominant (Pausewang, 1990; Hoben, 1973).

Pausewang's description of the institution of *gult* is shared by many descriptions (e.g. Hoben, 1973) in the literature, including local historians in Gäddärro. He wrote, "The institution of *gult* financed the overarching common interests of political organization, defense, infrastructure etc. (Pausewang, 1990, p. 41). He added, "The *gult*-lords, a nobility of political and military leaders, had rights to collect a share of the produce of all agricultural land in a given area, in exchange for their administrative, political, cultural and judicial services" (Pausewang, 1990, p. 41). In short, land was to the emperors and the provincial kings what money is to modern states. This tenure was changed in 1975 as a result of the Land Reform Proclamation and the 1976 E.C.[82] land redistribution implemented for more equitable possessions of land in Wello and other parts of rural Ethiopia. The grouping of the systems into the following four categories by Georgi Galperin (1981) might accommodate the major land tenure systems of pre-1975 Ethiopia. These are (1) Crown Lands; (2) Private Feudal Lands; (3) Church Feudal Lands; and (4) Communal Lands and Emergence of Private Peasant Holdings.

Crown lands were formed by government owned and imperial lands made of wide marginal and best lands in different parts of the country, including Wello (Galperin, 1981, p. 145). During Haile Sellasie's regime, this land, which was untaxed, belonged to the emperor himself and his family members to whom it was given as *gult* (Galperin, 1981, p. 145). The best and accessible land for crop, timber extraction, plantation and mines went under this large tenure which was furthered as the royal family bought up other persons' land at very cheap prices (Galperin, 1981, p. 145). The organized greed of this totalizing land tenure system was clearly stated in the following quotation:

[82] Ethiopian Calendar

> All lands not covered by right of private or communal ownership were declared government property. They were, in fact, a special "reserve" of the government and Court, who used them to grant land to individuals as hereditary taxed estates (*rist*) and as untaxed estates granted for the life time of the recipient (*gult*); for leasing into private or co-operative ownership; for resettlement and other development projects; as a reserve fund of Crown lands; for granting concessions to foreigners; and as pastures (as much as 78 per cent of all lands). A larger portion of government owned land consisted as a rule of the most impoverished and inconveniently placed tracts of land located in sparsely populated areas; however, there were also huge tracts of fertile land. In addition, the area of government-owned lands constantly increased at the expense of small-land owners and tenants who, being bankrupt, were unable to pay taxes three years in succession. For decades, vast tracts of government land were either under-utilized or altogether unutilized, this being one of the paradoxes of the pre-revolutionary Ethiopian economy". (Galperin, 1981, p. 145)

This tenure existed during the reign of Menelik II (1989-1913) and the interlude administration by Iyasu and Zewditu. Under the *gult* system, states "distributed bundles of income and judicial rights (gult) over newly conquered areas" (McCann, 1988, p. 285). McCann further said, "These imperial land grants, often recorded as marginalia in church documents, were not possessory rights over land, but limited claims over income and labour" (McCann, 1988, pp. 285-6). According to Hoben, the concept of *gult* among the Amhara was quite encompassing. Based on an ethnographic study among a rural community in Gojjam, he wrote "Gwilt [that is *gult*] rights were…far more than just a type of land tenure. They were an integral part of the Amhara feudal polity; they represented the granting away by a regional ruler of an important part of his taxing, judicial, and administrative authority" (Hoben, 1973, p. 5). As already mentioned, this right was rendered hereditary at some point during the rule of Haile Sellassie I, not only in the south but also in the north, to some extent.

The second form of land ownership, Private Feudal Lands, had also been an important characteristic feature of socio-economic relationship in rural Ethiopia, especially from the late 19th through the early 20th century (Galperin, 1981, p. 146). Military leaders, dignitaries, men-at-arms and the closest courtiers of the emperors took large and fertile tracts of land in all provinces of the country (Galperin, 1981; Pausewang, 1990). The Crown Prince, who

was one of the richest feudal lords, owned tens of thousands of hectares of fertile lands in the then Province of Wello, including the district of Wärräbabbo. The traditional feudal political hierarchy, from the emperors at the apex and the provincial overlords went down to small and medium governor-landlords (*balabbat*) to village headmen who "controlled and mastered the land and life of the Ethiopian people on the basis of private, family and class privileges" (Galperin, 1981, p. 146). Their domination was more than political and it affected every field of life.

> The feudal stood between the peasants and the State as a taxman and middleman during sales of farm products; between the peasants and the Church as head of the parish; and between the peasants and the Law as the judge. At the same time, landlords were also big usurers in the countryside. And, of course, the feudal lord was, above all, the owner of a considerable part of the produce of the tenant peasants: in the late 1960s-early 1970s, from 25 to 75 per cent of the gross produce was at the disposal of landlords. In addition, as a result of middleman operations by landlords and merchants, the peasants received no more than 35 per cent of the selling price. (Galperin, 1981, pp. 146-7)

Contracting land to cash crops and intensive farming was flourishing over the then existing feudal ownership of land, again at the expense of peasants, especially in the 1960s. Rich people who contracted in land made sub-contractual agreements with small farmers. The hiring of labor for agriculture intensified, including the hiring of urban unemployed such that the pre-revolution period was one in which a capitalist form of land ownership was emerging over the then existing feudal form of land ownership (Galperin, 1981, pp. 146-7). A class of rich men was creating in many places, including Wärräbabbo, as owner-cultivating peasants were forced to sell their holding and worked on the same holdings as day-laborers for the rich. Therefore, "On the eve of the Revolution, the peasantry rented 48 per cent of all fertile lands in nine provinces; this figure varied from 17 per cent in Wollo to 73 per cent in Illubabor (Galperin, 1981, p. 147).

Church Feudal Lands, including those held by monasteries, constituted the third important form of land ownership in feudal Ethiopia. Land, the nation's

principal wealth, was jointly held by the feudal-monarchist leadership and the Church which had been an important part of the political system (Galperin, 1981, p. 149). Religious leaders serving churches in different parts of the country managed this huge land under the church-monastery regime. While some writers (e.g. Pausewang, 1990) distinguish land held by churches institutionally and by the priests and other church dignitaries, the personal character of this form of ownership is strongly depicted by Galperin in the following excerpt.

> Church-monastic land ownership was typically private feudal in nature. The Church's legal status, including its right to own land, had actually remained intact from medieval times. The lands were not common Church property, but belonged to individual churches and monasteries. Parish (church) heads and monastery fathers superior emerged as major landlords, being in unrestricted charge of both the lands and the different land revenues. (1981, p. 149)

Churches and monasteries served the spiritual needs of the people (Pausewang, 1990) or prayed for the wellbeing of the emperors and the throne, according to my local historians in Gäddärro. These institutions had land under the *gult* system which was employed to finance them and support the priests and deacons serving them. Contrary to what is quoted above, according to Pausewang, churches' and monasteries' holdings had some separation between that meant for the upkeep of these institutions and for the personalities who run them. He wrote, "Each church and monastery had land from which it collected a share, in addition to some land for the priests who cultivated crops for their own upkeep" (1990, p. 41). Also in practice were, the mobilization of corvée labor *(wuğu),* sharecropping arrangements as well as the provision of personal and family labor for church and monastery people.

Therefore, an important section of the peasantry used to work under this tenure on different sharecropping arrangements. Fredrick C. Gamst estimated that towards the end of the 1960s about one-quarter of the peasants worked some land under this ownership system (Gamst, as cited in Galperin, 1981, p.

149). In the same period, as had been with Crown Land, about 50% of the land under the church-monastic tenure remained uncultivated in the face of millions of Ethiopians lingering on smaller patches of impoverished lands as peasants (Galperin, 1981, pp. 149-50). This form of ownership, added to the paradox already observed by Pausewang, and was essentially said to be a *rïst*-type tenure which the priests and rated owners possessed without time restriction (Galperin, 1981, pp. 149-50). What is more, owing to their political powers and religious services to the Crown, churches and monasteries were exempt from taxes. Actually, in addition to this privilege, according to Galperin "numerous churches and monasteries were given the right to levy state taxes for their own needs within their estates" (1981, p. 150). Such laxity in tax collection was not limited to this form of tenure. Even though much of the literature seems to be reticent on this matter, probably it pervaded the entire systems until the time tax collection was systematized and centralized during the period of Haile Sellassie I. For instance, Asnake has brought up such cases in his review of the land tenure system of Wello (1983). According to my elderly partners in Gäddärro, even when tax was formally paid, underrating, overrating and other cheatings were not uncommon, including illegitimate lifting of tax burden.

Communal Lands and the Emergence of Private Peasant Holdings were dominant features of the central and the northern provinces. It was estimated that up to 38% of cultivated land was under this form of ownership in Gondar whereas northern Shoa, Gojjam, Tigray and some districts of Wello also displayed its widespread existence (Galperin 1981, p. 150). Taxes were levied on this form of land ("a tithe plus as much as 20 per cent of the harvest plus sheep and goats" (Galperin 1981, p. 150), and of course honey, before it was lifted, part of which went to the state and part of which was retained by the local taxman (Galperin, 1981, p. 150). In addition to formal taxes, peasants served the lords; the church and the state in forced labor in order to retain their ownership of the land as taxpayers and soften their hearts to prevent

spontaneous eviction. In this form of exploitation, farmers from Gäddärro used to go as far as Dessie and Giššän to provide forced labor, sometimes carrying construction woods along with their provisioning. This communal land ownership had been generally described as follows.

> One can speak of communal landownership as the sum of family holdings at a given moment. Every five to eight years, communal land was subjected to redistribution among the community members (heads of families), with pastures usually remaining common property. Division of family plots into individual ones (when children left their parents to set up their own households, or when households merged after marriages of family members) generally took place simultaneously with the redistribution of the respective shares in the total communal land. (Galperin 1981, p. 151)

In this form of tenure, the *rïst* system was more of ownership to a community and the servicing of an obligation by a member than actual ownership of land (Hoben, 1973). Pausewang wrote, "In the Ethiopian cultural context, access to land was always interrelated with other rights. It was not a right in itself, but a function of membership in a kinship group, a community, a religious fellowship". (Pausewang, 1990, p. 39) In Gäddärro, today, the term referred to access or claim, mostly inalienable, to any form of property or right over property with a sense of its being bequeathed from parents to children and further transfer to future descendents, indefinitely. From what Pausewang has said, it appeared this has been a common feature of the meaning of the term across the entire Amhara society. He wrote,

> Amhara peasants referred not only to land when claiming to have *rïst*. The term *rïst* could equally refer to the right to residence in different places to which they could trace their descent, or simply the consciousness of security, founded on the proud feeling of being welcome in the communities of different villages, which included the right to membership in kinship, community and religious groups, as well as to the common use of land. It is essential to understand that land use rights are even today conceived as part and parcel of community rights and obligations, not as independent legal titles. (Pausewang, 1990, p. 39)

Before decades, the same notions had been described as *rïst* land and *rïst* right by Hoben in Gojjam (1973).

According to Bahiru *rest* is *"*ownership of land invariably heritable but as a general rule non-saleable" (Bahru, 2008, p. 105). And, *"[gult]* is right of tribute given in recompense for service, military or administrative; theoretically at least, it is not heritable" (Bahru, 2008, p. 105). Writing of *gult* (and negating others to some extent) he further said, "*Gult* expresses the ultimate precariousness of the position of the Ethiopian nobility. Not only does it preclude ownership of the land as such, but the right to collect tribute is itself subject to revocation. On the other hand, *rest* does not represent absolute private ownership of land. The *rest*-holder's right over his plot is curtailed by his inability to sell it and the specter of royal confiscation for treason or sedition". (Bahru, 2008, p. 105) However, through time, Galperin wrote, "Conditions were … created for an accelerated transformation of communal property into private peasant hereditary property. In this sense, communal landownership, which was essentially more patriarchal than feudal landownership, still proved to be a more dynamic transitional form for creating private households (Galperin, 1981, p. 151). This latter form of *rïst* management and its transformation is likely to have been the experience in the history of Gäddärro, according to my informants.

Towards the mid-1960's, private and peasant hereditary ownership was dominating in many places and as some rich people invested their resources on land purchase and production of cash crops using hired hands, the situation was transforming into a capitalist type of land ownership and production. This further exacerbated the social inequality in rural Ethiopia as the lands that were bought up were those already under cultivation by peasants who later became hired laborers. As already stated, this type of landownership was already forming in many parts of the country in the north, including Wärräbabbo, when the 1975 agrarian reform was made. Those benefiting from this arrangement were said to be the main opponents of the reform in the north whereas in the south the traditional feudal lords were the key enemies of the reform (Galperin, 1981, p. 153). However, the benefit of the reform was also

soon realized in the north, rendering them ally to the change rather than enemy (Pausewang, 1990).

Apart from the class divisions and groups within broader classes, access to land and the right to its produce were also part of the relationships between the strong and the weak. Especially in relation to the *rïst* system, powerful individuals could claim land under ownership of the weak which they won through litigation. Land litigation and access to others' land as such had been documented by Alan Hoben in Gojjam (Hoben, 1973).

The three land administration concepts of *rïst, gult* and *rïstä-gult* are perhaps better conceived as principles as well rather than systems of land administration alone (Hoben, 1973; Pausewang, 1990). The tenure and ownership rights associated with these principles and the systems reviewed had also been different with time as part of the gradual transformation of the feudal system. Although still then the peasants were oppressed, there was an edict issued in October 1928 towards improving land administration. According to Bahru,

> The edict gave legal confirmation to the ownership right of all *rest*-holders, guaranteeing against expropriation for whatever crimes may be committed….Even in cases of crimes committed against the state, the *rest* would pass on to the offspring or, that failing, to a kin of up to third generation remove. There was also a provision barring "illegitimate" children from inheriting *rest.* (Bahru, 2008, p. 105)

This edict, according to the same writer, was appreciated as a measure to improve tenure security on the part of people owning land and as an incentive to enhance production and improve land administration. The current and unresolved debate on land ownership in Ethiopia could well be linked to this historical edict.

There was another edict in 1930, described by Bahru as not only informative of its provisioning but also of the extent to which there was excess and unused land in the country in the early decades of the 20th century, as already

documented by other scholars also cited in this chapter. I quote Bahru at some length here:

> An edict was …issued on September 16, 1930, assuring landowners found holding land in excess of what rightly belonged to them on measurement that the excess land would not be taken away from them provided they had worked on it by cultivating, planting trees or digging irrigation ditches. They would only be required to pay the extra *geber* (tax) on the excess land. But if the excess land has been left idle, it was to be divided into four equal parts and allotted to the owner, the tenant on the excess land or, if no tenant was to be found there, the tenant on the legally held land, local *balabat*, previously expropriated on various grounds, and *dajjatañ* (i.e. petitioners for land). In the absence of any or all of the last three categories, however, their shares were to be granted to the owner after pledging through a guarantor to cultivate the idle land. Absentee landlords were to be given a grace of six months for notification before they were expropriated and the land sold. (Bahru, 2008, p. 106)

Ownership security on *rïst* land for the peasantry was further strengthened by the 1931 constitution, also strengthening the claim of property in land of the emperor and the royal family. The expropriation of *rïst* was to be effected only in the case of public utility upon which the owner should be properly compensated for. This practice has been in operation throughout the present both in rural and urban contexts. In addition to this, it has already been noted that *rïst* and *gult* were evolving into private heritable holdings which were sold and mortgaged. And at some point, the emperor did also free *rïst* from being subject to confiscation even after treason and sedition.

Land measurement as a state institution in Ethiopia is said to have started during the reign of Menelik II (Bahru, 2008, p. 106). Local history in Gäddärro perfectly matches with this national historiography. According to local historians, the land tenure systems instituted in Wärräbabbo during the rule of the overlord (Bitwäddäd Wälé) during Menelik's reign was to be dismantled only after nearly a century as a result of the 1975 Land Reform Proclamation. The notion of measuring land has capitalized the notion of land as a property and right over it. However, as my informants in Gäddärro recalled, land measurement has never been genuine and the royal families and most of the nobilities used it to under register the size of their holdings and to under rate government tax they were supposed to pay. Land registration

existed in what was then Begemdir and it then was replicated in Shewa in 1890s and a proclamation in 1902 effected land measurement and registration in Eastern Wellega (Bahru, 2008, p. 106). Excess land and uncultivated land were among the basic issues revolving around the rationale of measuring land, a condition which continued till the end of the imperial regime of Haile Sellassie I, as reflected by the establishment and operations of the then Ministry of Land Reform and Administration, whose functions were cut short by the popular revolution that was erupted in 1974. The literature on systems of land administration in Ethiopia lacks ethnographic depth. In the next section, I turn to the history of land tenure systems among the communities I studied. I shall thus demonstrate how the systems have been unfolding at local level in convergence or divergence to this review made at regional and country levels.

5.3 Land Tenure in Gäddärro and Wärräbabbo

As already mentioned, local historians' memories of their land tenure systems in Gäddärro and the entire Wärräbabbo begin with the area's rule by the overlord Bitwäddäd Wälé Gugsa during the reign of Emperor Menelik II in the last decades of the 19th century. During Wäle's rule, according to local categories, there were four land tenure systems and corresponding resource rights in present-day Wärräbabbo and other parts of Wello that were under his rule. The three principles of *rïst*, *gult* and *rïstä-gult*, reviewed in the forgoing section for the entire country, had also been there notwithstanding local and regional variations mentioned in the beginning of this chapter.

5.3.1 Yägäbbar Märét (Tax-payer's land)

Yali gäbbar and Yägäbbar märét: This form of land tenure had existed since the rule of Bitwäddäd Ali until 1975. During this rule that is during the period of Menelik II, there were two forms of tax-payers who tilled the land: Ali's tax-payer (*yali gäbbar*) and church tax-payer (*yäsämon gäbbar*). In the case of

the former, the land that was owned by the tax-payer was called tax-payer's land (*yägäbbar märét)*. During the regime of Menelik II, tax-payer's land was regarded with some prestige as there was no eviction as far as tax obligations in cash and honey and forced labor services were fulfilled. These tax-payers retained the lands that were under their holding into Hale Sellasie's regime and towards the end of the period, as already reviewed in the earlier section, they were freed from forced labor and every *gäbbar* paid a 15-birr land tax irrespective of size and quality of holding. Practically, the only difference for the *gäbbar* after a certain stage in the reign of Haile Sellassie I was that the ruling class (the lords) was made unable to evict a *gäbbar* as before. Tax-payers, during the reign of Haile Sellassie I, were free to transfer or exchange or sell their holding as before, together with the obligations they had to the lords or the state in return.

5.3.2 Yäsämon Gäbbar Märét

This land tenure existed during the regimes of Menelik II and Haile Sellassie I and had to disintegrate together with the downfall of the feudal system. Basically, this is land given to the church and/or priests by the state because of church's political influence and the spiritual services rendered to the goodwill of the thrones. Therefore, as in the case of the national tenure system already reviewed, it could be said land owned by priests and monastery leaders. The priests either worked and/or rented their land to any farmer who was willing to till it as a *sämon gäbbar* and share the produce on the basis of the *k'ïnnïn* (harvest or tax tariff estimate) of the land. The tenants did not pay tax for this land, since the land was owned by the priests, who also paid the taxes in their names. However, in addition to the share or rent they paid to the land owning priests, the tenants, including their families, had to provide free labor for agricultural, church and domestic duties. This land tenure had continued as before during Haile Sellassie's regime. The only difference was that after some time, the *sämon gäbbar* paid the tax to the district finance office

established at Bistima for which he was given a receipt in the name of the priest who owned the land. All the same, out of land whose tax was estimated at a 12 *k'unna* (local measure equivalent to eight kg) grain crops, the receipt for the tax of the 10 *k'unna* land was paid in the name of the priest (as *yämänïfäs gubaé* or church payment) whereas that for the remaining two *k'unna* of land was issued in the name of the *sämon gäbbar* who tilled the land. The reason this practice was introduced, according to local historians, was to enable the *sämon gäbbar* enjoy some share of legal ownership in the *sämon gäbbar* land he cultivated. The two *k'unna* land used to be the part for which the tax was to be paid in honey until in-kind tax was abolished. This tenure might be considered as a two-fold system. In the first place, as discussed in the preceding section, it belonged to the tenure "land belonging to churches and monasteries" that did or did not pay tax to government. It thus could be called it was their *rïst*. Secondly, the church elites, personally and representing the church institution, used to pass this land over to their preferred tenants who had to share part of the produce to the church or monastery personalities in addition to other obligations they serviced. Hence, it was also a kind of *gult*.

5.3.3 Yäzämač (zämač- gäbbar) Märét

Like the preceding one, this form of land tenure existed just during the first two political systems. It literally meant 'campaigning tax-payer's land'. Its possession was secured by armed men commonly known as *näfit'äññä* (musketeers) in return for their military service to the state. The obligations or responsibilities of these men included protecting the country from invaders and campaigning as necessary to subdue internal strives and uprisings against the systems.[83] They also used to provide security services such as guarding compounds of the lords and government offices (including prison houses) in rounds within their villages and beyond as far as Dessie. The *zämač* also used

[83] Käsäla, Sumalé, Tïgray, Afar and south Ethiopia were among the places these campaigners were used to be fielded for military purposes.

to serve as guards and aides to the *mïsïläné* (local government representative*)* and his secretary, the *s'ähafi*. Land belonging to the *zämač* was sold, exchanged or transferred in inheritance to others. These rights however were to be applied just on some part of the land, and not on all of it. If a *zämač* did contrary to this, all the land was to be confiscated from him and declared a free, state domain land. The other reason a *zämač* could lose his land was when he failed fulfilling his obligations as a *zämač.* This could be an aspect of what Bahru described as the precariousness of the *gult* system (Bahru, 2008).

The land tax that the *zämač* paid was said to be less than that paid by the ordinary *gäbbar*, considering their services to the state. Therefore, the *zämač* paid just some money, a nominal amount *(*or *sïm mät'ïria* as it was called then*)*, to symbolize that they were the legitimate owners of the land. It was said, the tax they paid in cash was half that paid by the ordinary *gäbbar.* What is more, they were free from the common labor tax knows as *wuğu.* However, after some point during the time of Haile Sellassie I, they were made to pay tax in cash as the ordinary *gäbbar* did, which was 15 birr (for a land of a *dawïlla's qïnnïn).* The reason the *zämač* were made to pay a tax equal to the ordinary *gäbbar* was because they were given the name *zämač-gäbbar* as they were allowed, unlike in the past, to continue owning their holding after withholding their obligations as a *zämač,* if they wished. Compared to the national history, this tenure belonged to the tenures under the *gult* principle. There were also older *zämač* who were called *k'äççé zämač* from the period prior to Haile Selassie I. As in the period before, during the regime of Haile Selassie I, it was possible for a *k'äççé zämač* to have many independently farming households under him who farmed tracts of land held in his name, including that worked by the *zämač* himself. For instance, I was told that a *k'äççé zämač* called Libän Wädağo in Awraççа used to have five households under him. The tax which was paid in his name was ETB 24 until 1975/6 and well after that for some time. Every household contributed towards the tax paid to government.

5.3.4 Yäna'im or Yäğäbäna Märét

This tenure also existed only during the former two regimes. It referred to land given by the state to selected sheiks thinking that as did the priests, they also prayed to the safety, well-being and continuity of the emperors and their thrones. The sheiks paid tax in the name of *yäna'im gäbbar*, but it was smaller compared to that of the ordinary *gäbbar.* Along with this, they were free from *wuğu* obligation and were able to pass over their holdings to their children, even when the latter did not end up being sheiks themselves.[84] Unlike the priests, their ability to generate public labour to work their land depended on their spiritual rather than political authority. What is more, the lands given to them were generally lesser than those given to the churches and monasteries (both in quantity and quality). Most of the time they did not higher other's hand for a share as did the priests.

5.3.5 Yangač Märét

Land under this tenure was that held by the *angačočč* (men of rifle) who rendered security services around the palaces of Emperor Haile Sellassie I and the residences of his regent in Dessie, Wello. Their female domestic servants responsible for household chores were also given land like the men, the *angačočč.* These people were given land wherever available in the country, including Wello. They maintained the land as far as they served their imperial masters. Being absentee landlords, often they sharecropped out the land to local tenants on equal share basis. Local historians said, around the end of his reign, Emperor Haile Sellassie I issued a proclamation whereby *yangač* and *gult* holders were made to pay *gult* birr (*gult* fee) to the then newly opened

[84] According to my informants, this was also done because they were considered as *yätïlïk' säw zïrÿya,* literally descendents of noblemen. The people of the areas also used to provide the needed agricultural labor to these sheiks who prayed for the goodwill of the communities, including rainmaking. The sheiks did this in addition to their role as *agäbar* in their respective societies. Such sheiks for the Gäddärro communities covered by this research used to live in Qädida, where their descendents still lived.

district finance office in Bistima, locally known as *gïmïğa bét.* The tenant paying the *gult* birr was able to use the produce of the land for him as the land-owning *angač* instead received this money from the finance office. Like the ordinary *gäbbar,* the *angačočč* used to pay tax for the land thus held. However, they were able to pass their land over to their children only if one of the children was replaced in lieu of the father or the mother as a state servant. The source of their allotments was state domain land which existed all over the country, including Wärräbabbo.

5.3.6 Yäwakkarra or Çiççisa or Yäk'äyé Märét

This was a common land held in the name of a village community to serve as a pastureland. According to my informants, just a few villages had *wakkarra* land during the two imperial regimes under discussion. Villagers who were not in good relations went in favor of dividing the lands among them as private plots and apparently lacked such a collectively owned land. Otherwise, all villages used to have their own *wakkarra* land as a rule during the regimes of Menelik II and Haile Selassie I. Tax was paid for *wakkarra* lands as well but some villagers used to complain about it as a double-tax. In Gäddärro, many hill lands were designated as such.

5.3.7 Tïkïläññä Märét

The *tïkïläññä* were tax collectors assigned by the ruling class to live in each *mïsïläné* (local representative) areas which were constituted of a number of *çïk'a* (administrative village). During the imperial regime of Haile Selassie I, the *gäbbar* used to pay honey tax (until it was lifted) to the *tïkïläññä* and they paid tithe *(asrat)* in *t'ägära* birr to the priests. The *tïkïläññä* were callable to the district administrator. They have had a very negative history with all the bad images of the ruling class in addition to their corrupt behaviors underrating or over-rating tax estimates for a bribe or lack of it. These tax collectors' job was supported and protected by the *mïsïläné*, who were the

local administrators in command of the peasants, and the campaigners as a local executive body of the state. In the case of Wärräbabbo, they used to come from such places as Shoa, Tigray, and Ambassäl.

5.3.8 Yänäçläbaš märét

The *näççïläbaš* also used to get good land. They were instituted during the later days of Haile Selassie I. There were such 800 local militia in addition to the traditional campaigners *(t'ïntawi zämač)* who were also 800, totaling 1,600 armed men in the entire district of Wärräbabbo when the regime of Haile Sellassie I was toppled in 1974.

5.3.9 State Domain Land

There was land kept idle as government property from which grants were made to those who had good record in serving the government. Lands confiscated for various reasons from individuals were also combined to this pull of land.

5.3.10 Private Non-taxed Marginal Land

All smallholders under different tenures described above had access to non-*wakkarra* hilly and marginal lands aligned to their homesteads and farmlands for which taxes were not paid. They made use of these allotments as grazing lands, as woodlots and later on as farmlands due to shortage of cropland.

In general terms, in Gäddärro and the rest of Wärräbabbo, in addition to the afore-mentioned land holding systems, there were additional systems. As in other parts of the country, those who had the money, irrespective of their social class, were able to purchase land through *wälläd*a*gid*[85] (mortgaging) and as a private property that is *rïst* in line with what has already been said for

[85] Mortgaging land allowed the purchaser to use the land as a *gullïmma* (temporary holding) until the debt was paid in full.

the country (See section 5.2 above). Such people who used to accumulate lands through purchase from some *rïst* holders were able to be owners of big lands closer to that of the nobilities (*mäsafïnïtoč).* For the most part, these people were merchants and administrators. After they bought the lands from the original owners or *balärïsïtoč,* the buyers or new owners used to have the sellers as tenants on the same land they formerly owned.

It needs to be noted that the most land-poor were the *çïssäññа,* and not the *gäbbar*. The *angač* had better land, most of them stationed in Dessie serving the Crown Prince. The *zämač* also used to have better land and the *näčläbaš*, too. The *angač* used to have *gult märét* in different places say in Wärräbabbo, K'allu and Yäğğu just in the case of Wello. The *angač* did not cultivate; they did this through *çïssäññа* or others in *mäggazo* and *ïrbo* sharecropping arrangements. The major characteristic features of the *gäbbar* system (that is cultivating land by paying tax for it0, including post-1974 Ethiopia, is presented as Appendix 5).

5.4 The 1975 Land Reform Proclamation

The first measure taken by the *dergue*, in relation to land, and of course, overall rural socioeconomy, when it came to power, was the 1975 land reform proclamation which still has impact in rural land ownership. This was part of the structural changes that the *dergue* took in the economic, social and political conditions of the country (Mulatu Wubneh 1990). Based on this proclamation, all rural lands were declared to be government and public property and to remain in the hands of those who cultivated them. Absentee landlords were confiscated their land except what was needed to support their living if they had no other means of sustenance. Some of the nationalized lands were retained as public properties under the custodies of local government institutions. Mechanized farms were pooled from confiscated holdings to form state farms that were managed by government. Thus, the majority of the cultivated lands of the country were put in smallholders'

usufruct right. Nonetheless, existing inequalities in size and quality of land holding continued largely an affected, though this differed from place to place, for about a decade. The reform was not accompanied by redistribution in every parts of the country.

In 1975-6 the *dergue* established what is called peasant associations across the country to replace the feudal administrative structures down to the grassroots level, and to implement the proclamation itself. After land was bounded by the theoretical 20 *gašša* (40 hectares) area for one peasant association, it was not possible for a person to have land out of this restricted territory. Therefore, farmers who owned land out of what became their peasant associations were forced to lose them. If a young woman was married out of her peasant association, she was made to lose her share of land with her natal family. If there was spare land in the peasant association she was married to, she could apply for some; if not, she was forced to live just on her husband's share, if he had some himself.

The land tenure systems that were in existence during the time of the *dergue* in Gäddärro and Wärräbabbo as a whole were: (1) private farm/field plots; (2) producers cooperatives land; (3) private grazing land; (4) government forest, bush or enclosed land and (5) farmers' communal hill lands in some places. Some parts of government lands were in effect used as communal grazing lands *(yägara or yäwäl märét)*. Villagers were allowed to fell big trees within their holdings only after securing permission from the local natural resources office. Trees cut without this grant were confiscated.

5.5 Land Redistribution, Socialist Collectivization and Some of Their Impacts

After the inequalities inherited from the feudal system were sustained for a decade, in 1976 E.C. the *dergue* issued a new directive to redistribute land equally and equitably among farming households. According to this directive,

my informants said, every land was measured by ropes in which every household was given land commensurate to its size. Though, according to the directive, redistribution was to be fair and equitable, actually it was not. The Gäddärro experience shows local authorities, those who had relatives in the peasant association councils and those who were able to bribe the land re-distribution committees were able to get bigger sizes and more fertile lands. As in many other parts of the country, three scales were employed to rate the land: fertile *(bodda)*; middling (*mäkakkälläňa*); and poor *(sïs)*.[86] In Gäddärro and the rest of Wärräbabbo, based on public decision, a parcel of 20 meters by 20 meters was employed to allocate fertile land for an individual whereas the measure, 20 m by 25 m, and, 30 m by 30 m, were employed for middling and for poor land, respectively. As a homestead and backyard space, every household received an additional land measuring 30 m by 30 m irrespective of the size of its household. However, every member of a household received just one measure of land as a farmland. While every household in Gäddärro FA had received some land in this form, the quality of the land was taken into consideration, rendering the size bigger where the quality was weaker and vice versa.

Villagers' memories of the redistribution and its lingering effects seem to be quite vivid. Though the directive was honest and impartial, apart from the administrative partiality mentioned on the part of local officials who implemented it, it is remembered that their coincidental settlement and micro-geo-morphological variations within what were called peasant associations and villages within them were very important. For example, the entire Lugo villages have had better land; Little Gäddärro has had quite good land; Binné has also good land across its horizontal stretch even though not as good as Little Gäddärro. On the contrary, Awraççа, including present-day Mïsïräta, has had less fertile land. With some sense of regret, an old man described

[86] Ayalneh (2002, p. 85) has identified and described the same categories as *lem*, *mehakelegna*, and *tef*, meaning, fertile, moderately fertile and degraded, respectively, among farmers in Merabete district, North Shoa zone, Amhara National Regional State.

Awraççа as "Ours does not stand both sunshine and rain. God did that. The farmer simply works the land and takes whatever it has to offer him. The difference is from our original spatial distribution; we were apportioned land perpendicular to our homestead location".[87] This man was referring to what was called *yäbét mäbït* (right of residential house) which had a lottery effect, benefiting some and dis-benefiting others, as households had to accept land in line with their homesteads and lose, if not. Thus, those farmers who used to have fertile land in line with somebody else's house were forced to leave that land. Fortunately, if there was land in line with their house but owned by other farmers, they had these farmers evacuated but in cases not, they had to suffer the consequence by receiving marginal land somewhere else. Even though there was also what was called 'right of perennial tree crops', in many instances, this was also considered by my informants as a disadvantage to owners and a blessing to those who did not own orchards. On an overall note, Hussein Jemma documents a similar depredation as smallholders' land considered 'useful for cooperative farming' was snatched and brought under producers cooperatives and the smallholders were given other land available in the jurisdiction of their farmers associations (1997, p. 169).

Those households who were settled on cliffy places were said to have been the most disadvantaged together with those who lost their perennial crops such as coffee and oranges. Those living on cliffy lands were given land in other places as far as that land did not fall in line with others' houses or if there were land patches remaining after it were apportioned for others. Such farmers had also to accept less fertile hilly areas with the advice that they could hoe and domesticate these "virgin" lands. One of my informants remarked *"Käzza wädih ïyyaräsä ïyyädänäggorä läm addärräggäw; dännu hullu*

[87] Field notes

tädänäggorä"[88] to mean *"since then, everybody cleared the vegetations and developed the areas into croplands".*

My informants said there was no spare land as such when this re-distribution was made in 1976 E.C[89]. Of course, land in the third category, infertile, marginal, hilly land, and that was believed to be further degraded, was not given as private holding except when this was found mandatory. However, after the farmers cultivated all the land in their holdings, they illegally started to hoe and convert into croplands these marginal lands that were excluded from re-distribution, in principle, as state owned land to be protected. Those farmers whose allotments were not nearby uncultivated hill land were given additional infertile land in the name of *çïk'a mabbäša* or *agäda märïça* or *mofär mabbäša*[90]*,* closer to their homes or in some other places. Of course, there were also some farmers who were not given this because of lack of the resource. As already mentioned, villagers' memory of the 1976 E.C land redistribution made in order to achieve a more equitable distribution, is fraught with corrupt practices, which are to some extent still held responsible for undue differences.[91]

Following this, farmers were made to unite in producers' cooperatives where 50 to 100 or sometimes 200 households were made to redraw their holdings as one producers' cooperative. The members of the cooperatives were made to work and produce together and share their harvests on the basis of socialist principles. Those farmers who were not interested to join the cooperatives and declared so had been evicted (where their lands were adjacent to the cooperatives' lands) from their fertile lands in return for poor land wherever available in the FA. Producers' cooperatives, on their part, were made to sell

[88] Interview transcript
[89] Ethiopian calendar
[90] This area of land was meant to have a space for livestock nearby one's homestead, also in order to avoid crowding that might create otherwise.
[91] It was reported that complaints were not properly received by local authorities, and of course, n some cases, complainants were reportedly beaten.

10% of their produce to the government owned agricultural produce marketing enterprise called AMC. What is more, my informants said, all farmers who used to have more than a pair of oxen were, at one period, forced to sell one of their oxen at reduced prices to the responsible government office at Haik to supply canned meat for the defense force of the country which was engaged in active war with the invading forces of neighboring Somalia.

As a result of the historical process just reviewed, in the first place, the already weak and arbitrary tenure security which affected investment on land and its good management as well as the development of water and tree resources, were ironically made to spill over to the new political systems. Secondly, landholding inequality both in terms of size and quality has contributed to economic differentiation among households. Thirdly, new practices of erecting a second house and planting fruit trees such as oranges and *çat* (trees in general) were introduced by some farmers as contingency measures to protect their holding if further, unexpected redistribution was to happen in the future. Many scholars have reported that private tree ownership had been problematic till the demise of the then government (e.g. Alemneh, 1990). As in the past, today, farmers in Gäddärro are required to fulfill legal requirements to fell a tree, including the requirement to bear an official pass to transport woods more than a certain limit. Even though it might be difficult to say this regulation affects tenure security and the rate of individual tree planting, the impact is likely to depend on the ecological consciousness of a given society. Actually, in recent years, private tree planting in Gäddärro has dramatically increased while this regulation has still been in force, though theoretically largely. If tenure security is to be understood as freedom from any external influence in the management of land and land-based resources, the whole reasoning might run the risk of losing the environmental quest of the era. This aspect is discussed further in the concluding chapter.

It has already been noted that in 1976 E.C. land was re-divided amongst rural households based on headcounts of their members. The social and economic differences based on hereditarily and politically engendered differential access to land were thus significantly abolished. Further to this, when all villagers, including babies and small children, were given their share of land and established the family pool of land, lineage and kinship ties and the influence of the elderly on the young were further eroded. When land certification came down on the line during the current EPRDF government, individuals of all sex and age became more conscious and defendant of their rights of access and entitlement to land as part of their citizenship rights and equal treatment by the state. The rights of children, women, the sick and the old are more pronounced and given especial protection. Many villagers, especially the elderly, have, among others, explained out the older generations' growing lack of control over the younger generation in domestic affairs by the growing individualization of the land tenure system. The same explanation is also applied for women's increased say in domestic affairs and administrative matters in their communities. This socio-political change has had further impact on the social organization of labour, agricultural production and productivity as well as overall socioeconomic performance of a household. These aspects are discussed in Section 5.8 below.

5.6 The Current Land Administration and Use System: Legal and policy environments

The Constitution of the Federal Democratic Republic of Ethiopia, the basis of the current systems of land administration and use in the country, grants to its citizens the right to ownership of property. Article 40 of the Constitution, states "Every Ethiopian citizen has the right to ownership of private property. Unless prescribed otherwise by law on account of public interest, this right shall include the right to acquire, to use and, in a manner compatible with the rights of other citizens, to dispose of such property by sale or bequest or to

transfer it otherwise (FDRE, 1995, pp. 97-8)". The article, in its sub-article 2, further defines private property as "any tangible or intangible product which has value and is produced by the labour, creativity, enterprise or capital of an individual citizen, associations which enjoy juridical personality under the law, or in appropriate circumstances, by communities specifically empowered by law to own property in common" (FDRE, 1995, p. 98). Ownership of land, a key national resource of the country, is vested in government and the people of Ethiopia, prohibiting sale, lease, or mortgaging. Thus, individual citizens and other entities with legal personality have just usufruct right. This is clearly stipulated in the Constitution (Article 40.3): "The right to ownership of rural and urban land, as well as of all natural resources, is exclusively vested in the State and the Peoples of Ethiopia. Land is a common property of the Nations, Nationalities and Peoples of Ethiopia and shall not be subject to sale or to other means of exchange" (FDRE, 1995, p. 98). The same article (Sub-articles 4 and 5) grants the right for peasants and pastoralists to obtain land freely to support their agricultural and pastoral economic activities, including the right of protection against eviction and the right to alienate, to bequeath and to remove their properties from the land they possessed. This right includes other citizens while private investors are required to pay for the land they used. The right also includes the benefit from immovable property and permanent improvements made on the land by the labor, capital and creativity of the concerned party (FDRE, 1995, p. 98). The supremacy of state and public ownership of land and land-based properties is however clearly stipulated in sub-article 8: "Without prejudice to the right to private property, the government may expropriate private property for public purposes subject to payment in advance of compensation commensurate to the value of the property" (FDRE, 1995).

The current environmental protection, land administration and use policies, guidelines and directives of the country are based on this Mother Law of the Land. Proclamation no. 456/2005, the Federal Democratic Republic of

Ethiopia Rural Land Administration and Use Proclamation renders government the owner of rural land and grants peasants, semi-pastoralists and pastoralists with the possessory right to land in order to support and improve their living without time limit based on the provisions of the Federal Constitution. In order to improve the economic return and ecological management of rural land, land measurement, registration and issuance of ownership certificates are also provided for in the proclamation, including obligations of rural land users, rural land use restrictions and minimum size of workable plot of farmland.

As stipulated in article 52 (2) (d) of the Constitution, regions have been entrusted with the power to administer land and natural resources within their jurisdiction in line with Federal laws to be enacted for the purpose. While state control of land is still a legacy of the past land administration of the country, such restrictions on the use of private labor and leasing rural land, aspects of the land administration systems of the defunct socialist government, are lifted by the new proclamation with the view to improve tenure security and encourage the conservation and management of natural resources. Based on the Federal Proclamation and the power entrusted to it by the Proclamation, the Council of the Amhara National Regional State has developed its Rural Land Administration and Use Proclamation which it has revised in 2006 - Proclamation no. 133/2006. While the Federal Proclamation envisages the chance of re-distribution based on regional realities, the regional Proclamation preempts the possibility of rural land re-distribution or allotments save on irrigable lands.

Currently, in Gäddärro and Wärräbabbo at large, most of the farming households pay ETB 20 as a land tax for holdings under their possession. The rate is applied irrespective of size and quality of land even though some households keeping more than 10 or so *gämäd* (about 2.5 ha.) of land are made to pay ETB 35 since some point in the past. Both rates are still applied

even though it is complained that flat rate is not fair. This tax that every household head should pay is locally called *fré gïbïr* in order to keep it distinct from other contributions that farmers pay. Regardless, farmers tell the total amounts of payment in the year when they are asked of taxes that are due for government. Normally, land and the other contributions are paid from September to December, a period favored by tax collectors since this is the main harvest time and farmers are able to pay up from the sale of their produce.

5.7 The 1984-86 Resettlement and Villagization Programs

As part of a solution to the 1984-5 famine, the then *dergue* government resettled people from affected areas in Wello and other provinces to western provinces such as Wälläga and Gojjam, where there were "ample" uncultivated "virgin" lands. Largely, the resettlement program across the country was not based on the interest of the people. According to my informants in Gäddärro, even though the re-settlers were given free food rations before leaving, many reportedly died on the way because they were already starved and weakened before leaving their origins. Then, the land that was left behind and some leftover marginal lands from the 1976 E.C. redistribution were tipped to those who stayed behind. According to my informants, this process was not also faire. At the same time, land that was not cultivable was given to every household in the FA on the basis of mere estimation *(yayïn gïmït)* rather than measurement as before.

Along with the resettlement program, there was villagization taking place by those remaining behind. In Gäddärro FA, there were two villagization centers. While there was a committee formed for the villagization program, it was executed by rule of force and not by interest of the people. When the villagization sites were specified, those farmers on whose holdings the sites fell were given replacement land from those held as land without heirs *(yämotä kädda märét).* In this program, in order to build a house, each

farming households were given a plot of land measuring 500 square meters. In Gäddärro FA, as in the others, there were two villagization sites built at K'és Gända and at Awraççça. By the time the rule of the *dergue* was weakening and staying in villagized sites was rendered optional by law, except few households, the rest demolished their houses and resettled to their original homesteads. According to my informants, this happened because from the beginning it was based on coercion rather than volition. The other reason was that farmers wanted to stay nearer to their fields in order to be able to dump manure on their fields. However, now after several years when an electric line has passed through the two former villagized sites, the same farming households are incredulously attracted by these places and are building houses mostly to rent or run such businesses as shop keeping, inns and in some cases as residences to be occupied or rented. This is very conspicuous in the case of the Awraççça villagization site, which has received the new name Mïsïräta after the Amharic term *mändär mïsïräta* for villagization. On top of the electric line passing by the village, that a health post, a telephone service station, a school, a police station and an agricultural office have been established there serves as additional attractions.

5.8 Land Tenure Systems, Rural Stratification and Their Likely Impacts on Land Degradation

The land tenure systems of feudal Ethiopia had been major causes of differentiation among the Ethiopian population (Cf. Hoben 1973b). Local perceptions of the social structural differences are largely based on this tenure differences each group having its status and rights and obligations. Hoben had documented how land rights are related to key aspects of social, economic, and political relationships among the Amhara of Gojjam (Hoben, 1973). He further said, "While power and status are certainly related to control over land, it is inaccurate to say they are based on it (Hoben 1973, p. 9). He made this observation because, "It would be at least as true to say that control over land

is based on power, for…individuals who increase their political power are able to increase their holding of "hereditary" land" (Hoben, 1973, p. 9). The findings of my research also bear this relationship. Whichever, access and entitlement to land have always been causes of inequality as agriculture has been the mainstay of the economy, both for the people and the state. Such relations to land have defined the ways in which individuals are socially structured in their societies as rulers and the ruled or as exploiters and exploited. Belonging to the different classes with differing access to and restriction from land had determined the place of individuals in the social structures of their society.

Other axes of socioeconomic differentiations such as descent and gender compounded the situation to result in wide disparities among individuals otherwise occupying relatively similar natural environment within a society. The historical experience of Gäddärro reveals great inequalities resulting from the work of such factors as peasants and landlords interacting in the management of land-based resources for subsistence reasons and the maximization of surplus value. From the Gäddärro experience, the differences and disparities seem to be more elaborate than what has been presented in the literature. In this section, therefore, I shall reconsider the key influences of the land tenure systems already discussed in this chapter and rural stratification to the extent that detailed understandings are revealed to enhance our knowledge of the political economy of land-based agricultural resource use.

The major land tenure systems described for the period of Emperor Menelik II and Emperor Haile Sellassie I had corresponding social groups or classes. Even though the distinction ruling versus ruled classes is somehow useful, yet it camouflages important differences that existed mostly within the category of the ruled. In the case of Gäddärro and Wärräbabbo at large, Bitwäddäd Ali Wale, the overlord of that part of the country during Menelik period, chose large and fertile lands for himself before he distributed land to the

commoners. His descendents, who ruled as provincial, sub-provincial and local landlords and their collaborators across the district, all the way down to the traditional village bureaucracy, took the next larger and fertile lands. Next to this officially declared ruling class, whose superiority was also buttressed by the ideology of the mythical Wärrä Burk'a clan, to which the ruling group belonged, the priests (the *sämon gäbbar*) and their descendents[92] had enjoyed second rank in the social structures of the district. Of course, the priests used to have wide and fertile lands not only where they lived or were relocated but also in the different nearby territories wherever better agricultural lands were available. As already mentioned in this chapter, they also hired others' labor or tenants to work their lands on the basis of customary arrangements in addition to forced public labor imposed as land tribute. Sharecropping is associated largely with poor land conservation.

What is more, as already discussed in this chapter, the emperors, provincial and sub-provincial lords or administrators depended on the land as a source of their military and grassroots administration. Towards this, they recruited voluntary men from every community who served as local militia and stood always ready for campaigns with their self-armed rifles and self-rationing. During the period modern systems of armed forces were not there and the bureaucracy was not yet monetized, this had been the best option and the men who formed this force, also formed a distinct social class with better access to land resources, discounted tax and exemption from forced labor. They also enjoyed public deference. This group, known as "campaigners" as already mentioned, also enjoyed better status even in the minds of the ruling class as against the commoners. In the social structural ladder, it could be said these people and their families enjoyed second or third rank. Their social affinity and day-to-day activities were consciously segregated from that of the

[92] Today, the descendents of this group who were responsible for spiritual service to the feudal states occupy the village called K'és Gända, a mountain top and a relatively fertile zone less affected by drought when most of the surrounding villages are rendered vulnerable. It includes what I have called Little Gäddärro to make this place and its surrounding distinct from the bigger Gäddärro FA. Villagers could be heard applying the term for both places.

commoners; identifying themselves with the upper classes whenever possible. As already discussed in this chapter, the campaigners had better access to large size and fertile land. In effect, they were part of local landlords who were called *abbabidra* even though the term landlord as described by Hoben is so wide including even the poor as far as they have some land to have others work on it (1973). On the part of the commoners, working for their masters and their campaigners taking days away from their fields most probably meant inhibition from working their fields to the desired quality. This in turn is likely to have affected care given to land management and level of production.

At the base, the commoners formed a rather divergent structure even though in most of the literature they are presented by the generic terms "the peasantry" or "the peasants" or "the rural broad masses". Those who were able to have their own holding for which tax and tributes were paid, had more tenure security than the others within this category. The others within this category are of course those who did not have land at all and hand to rent or sharecrop and/or those who had temporary access to some land granted by those who had it (the *abbabidra*) in exchange for services rendered to the land owners, including the *gäbbar.* These down-trodden groups were called the *çïssäññä*[93], the *gulïmäññä*[94] and the *mïnïddäññä,*[95] whose lives were hung on

[93] These were landless individuals who, according to my informants' expressions, entered into a slave-master type of relationship with land owning persons who earmarked them some land to build homes and grow some crops. This Amharic term literally meant "a smoker or one who smokes" in order to stress that the land they thus get is not any more than that sufficient to cook some food. When their relationships with their masters were severed, they were forced to evacuate the land and fallback into their former landless state.

[94]These were landless individuals, including women, who used to be earmarked some amount of land by their parents, relatives and friends. It could be based on the client-patron kind of relationship mentioned for the *çïssäññä*.

[95] Active children were employed as servants in the families of the rich for domestic and agricultural labor, including serving them as personal guards. On such cases, the lords used to give to these persons some land called y*aškär madäria* from their own holdings or the state lands they held under their administration. The cultivators do not pay tax for this land since the ownership of the land belonged to the lords who were also the ones who paid the tax.

the slender threads of their relations with land owning others, including the *gäbbar or* owner cultivators, categorically presented in the literature as the ones exploited. These landless groups had been attached, if at all, to the land as tenants in a very precarious, extremely exploitative way. Land conservation had been certainly a non- or very less attractive issue for them.

Individuals who were also engaged in trading as a supplementary job, including landlords and administrators, accumulated money and bought land in the form of *rïst*, with a more secure and permanent right of property than all the other land tenures. As already suggested, such people and their families were forming a kind of social class distinct from the rest of the commoners. Personal efforts including political acumen and entrepreneurial skills were mentioned by my informants as additional factors behind individual success in this regard. This meant that as Hoben (1973) documented for Gojjam Amhara, the understanding that land ownership was just hereditary among the commoners did not carry weight as siblings could result in having different access to land and social status through achieved rather than ascribed means. These local elites were also the ones who were politically conscious to manipulate in their favor the then feudal bureaucracy and land policies that allowed the sale and the mortgaging of agricultural land. No longer than these emerging capitalists started to convert the rural masses into a farm laborer on the same land they owned before selling the parcels, the feudal system was dismantled and the arena for a new form of social structure in rural Ethiopia opened.

The inequalities resulting from differential access to land gives just a partial picture of the exploitation that existed in the feudal systems under consideration. Equally, if not more, the commoners were subjected to different forms of institutionalized obligations to the ruling class, the landed priests, the campaigners and the peasant-cum-landlords in order to maintain their tenure security over the land they cultivated or in exchange for a

temporary access to some form of land. Therefore, men and children who have come of age serviced the customary forced labor already mentioned as *wuğu* to local, district and higher level leaderships. In the feudal systems under consideration, if crops failed due to natural reasons, the taxes were carried over to the next year. Otherwise, they were not written off always. If the next year the crops did well and there was better harvest, arrears were generally paid. If there were farmers unable to do so because of various reasons, they were made to render equivalent labor service to their masters. If they had children (sex did not matter) who had come of age, they were bonded to the families of priests and the other landlords in return only for food until the arrears were paid up in full. Child bondage was also done in order to soften the hearts of their masters and prevent spontaneous eviction from the land. This lack of insurance against natural vagaries had most likely compounded the then existing problem of lack of tenure security, also affecting land conservation. It could also be seen as part of the institutions that supported large family size, increasing the consequential pressure on natural resources.

Those sections of the communities who had the decisive hands in land administration are thus likely to be the last to feel the negative effects of land degradation but the first to create and promote the socioeconomic conditions that pressurized the majority of the rural population to continue degrading the land. Accordingly, all those along the vertical orientation of the tenure systems are likely to have felt the problem of land shortage differently, the landless feeling the first and the most pain and the area chiefs feeling it last and least, if at all they did. Again, since the land owning class did have much tenants under them and uncultivated reserve land to which they freely shifted if need be, they did not encourage their tenants to invest on the land in order to increase revenue. Conversely, the taxpaying groups were reserved from doing so, because the system denied them the right to benefit from labor, capital and ingenuity they put to the land. Therefore, the socioeconomic and

political conditions in the vertical orientation already mentioned, had discouraged both the landowning and the tenant (landless) categories from conserving the land, rather encouraging them to further deplete and weaken its resources. The periodic division and re-division of *rïst* land cultivated by villagers having or claiming a common descent until this custom was removed by growing individualization of holding, which also most likely existed in Wärräbabbo as well, had exacerbated the problem of land degradation. This is part of the horizontal aspect of the land tenure systems. The level of contribution of each class is difficult to account for but it is not very difficult to say in retrospect that their contributions to the degradation problem had been there at different levels.

During the feudal period, differential access to land had been a very important factor behind differential economic growth and social inequality among rural households. This should not be however taken to mean that having good amount of land necessarily resulted in economic betterment and increased social status. According to my informants, there were people with good land amount and quality but poor because of personal reasons, mainly 'laziness'. Lack of economic use of resources, including extravagant consumption of food, has also accounted for past, and of course, present impoverishment among these communities. After the historic 1975 land reform, the strong correlation between land tenure and rural economic and social differentiation has been officially removed. This nonetheless should not be taken to mean that land has ceased to be an important axis of socioeconomic differentiation but less so compared to feudal Ethiopia. This is only to emphasize that better efforts in farming such as investment, participation in modern education, petty trading, and casual labour as well as internal and external labor migration have become predominant factors of socioeconomic differentiation during recent years. Hence, the (first) land tenure that was instituted (or existed) during the rule of Wälé and that had been descending from generation to generation with its corresponding social groups already discussed was

dissolved by law and all citizens were to be seen on a par as far as their relations to the main national resource, land, was concerned.[96] The sociocultural changes that had been adopted by these rural households during the feudal period, that of the *dergue* and the EPRDF, which has been in power since 1991, are better understood in light of these historical, political, social structural and economic differentiations among the rural populations of Ethiopia. Added to these are other circumstances such as agricultural technology diffusion and the global labor market as important factors affecting local land resource management and responses to environmental problems. (These issues are discussed in Chapter Twelve).

5.9 Conclusion

Most of the scholars of Ethiopian agrarian policy agree that the land tenure systems of the country, including those of the feudal systems, which to a certain extent allowed the sale and mortgaging of land, have been exacerbating the land degradation problem because they affected the tenure security of farmers. Today, all Ethiopians who what to till the land and live on it as a primary source of their living are entitled by law to possess land on a usufruct basis, while the state remains as the ultimate owner of land. The chapter has illustrated that the rights and obligations of land ownership and cultivation have undergone transformations even though there had been much continuity rather than change until and after the 1975. Since the last decades of the 19th century, the exploitative landlord-peasant relationships had been on the decrease with important changes after the Italian occupation and had to disintegrate with the coming to power of the *dergue.* Comparably better

[96] According to local historians in Gäddärro, the first land ownership assessment and its legitimating was carried out during the rule of Wälé. The most elderly used to say, *"Yämäret t'ïnat yätädärrägäw bäwälé gïzé näw [land measure and allocation was carried out during the rule of Wälé]."* Hence, the saying: *"Bäwäle yïrïga bask'ari yïnïga"* to refer to the permanence of that system. All available land was reportedly distributed to individuals or institutions who became their owners during that time. My informants said, in spite of some changes that underwent, structurally it had remained intact until the 1974 land reform.

development opportunities ushered in at the emergence of the EPRDF government in 1991. On the contrary, state concern in the development of agriculture, combating land degradation, feeding the growing urban population and collection of surplus values have brought the state more and more close to the farm gate as a councilor and at the same time controller of important agricultural decision-making. Therefore, the relative farm management independence such as what and how to crop enjoyed by smallholders in the contexts of the feudal systems has gradually diminished over the years. The impact on farm management at household and village levels of this growing state intervention has economic, social and ecological nature. These aspects of state administration of land and agricultural activities are considered as deemed necessary across the rest of the chapters in the analyses of the adaptive, modifying and communicatory aspects of the human-environment relation.

The systems of land administration have also been an ecologically affected factor in smallholder-land relationship in Ethiopia. In the 1976 E.C. land redistribution, villagers in FAs with relatively more land got more allocation. Currently, the maximum holding for a rural household in lowland areas is set at 10 hectares whereas in highlands it is seven. All the same, with growing extraction of land resources, population increase and scarcity of arable and pastureland- all sub-topics to be treated in the rest of the chapters- the ecology has started to exert important impacts on land administration. Perhaps, a typical example of this is the withdrawal of the intentions to effect land redistribution in the Amhara region, including Wärräbabbo, on account that the population-land ratio did not allow further economic redistribution.

The chapter has also analyzed the past and current land tenure systems and their impacts on the social structures of the rural population. In this regard, it has revealed that the social structures of feudal Ethiopia had been diverse compared to the landlord-peasant distinction that has been dominating popular

views and scholarly tradition. In so doing, the analyses have demonstrated that the structures had vertical and horizontal orientations such that, for instance, in the generic category otherwise simply taken as the peasantry, there were different groupings such that some of them were closer to the ruling class than the oppressed rural broad masses. Linking these structural differences to the issue of land degradation and overall natural resource use problem, it could be generalized from this chapter that feudalism was inherently unconscious to environmental rehabilitation and conservation in Ethiopia. As such, the broad masses of the rural populations were forced to continue degrading land and land-based resources because they worked largely under insecure tenure arrangements which included eviction and misappropriation.

The chapter has also presented the category of the ruling class as the one which created the socioeconomic contexts in which the majority of the rural populations were forced to degrade the natural environment rather than conserve it. Even though the 1975 Land Reform and the 1976 E.C. land redistribution had drastically changed the social structural set up of rural Ethiopia, these laws only eased the pressure on land just for some years. Even though there were no strong evidence to rule out the argument that post-revolutionary Ethiopia land tenure systems did not create tenure insecurity over the possessory right to rural land, recent improvements are likely to be toward a positive trend. All the same, inasmuch as the tenure insecurity of the past could be defended to have sustained into the present, it could be said that the entire tenure systems have contributed to the creation of what I already called the socioeconomic condition for the further degradation of natural resources.

It should also be noted that the tenure insecurity mentioned above is not simple and straightforward. For instance, eucalyptus tree planting was highly expanding in the area of the study, and the country at large, in the face of this tenure insecurity and even under unclear tree ownership, which apparently run

against the freedom and right of those who grew trees. While it is also not simple to debase the counter argument, the proposition that humans protect and care their properties only if they knew that they are the sole owners invites some important criticism. Farmers' perception of soil erosion, their understanding of the economic impact of soil erosion, the economic return of soil conditioning and many other socioeconomic and cultural factors interplay to influence farmers' resource management behavior apart from land tenure.

The claim that lack of farmers' ability to sell or mortgage their land affected their resource management practices in environmentally degrading ways also needs to be cautiously evaluated in relation to other factors. The link between land ownership, which is percept, and positive resource management, which is the behavior supposedly resulting from this precept, has been complex rather than direct. Though it was at times breached, yet as a rule, tax-payers were not simply removed from their holding by local or higher level officials as far as they paid tax and other dues required, though this was restricted to north Ethiopia. They freely sold and mortgaged their *rïst* holding towards the end of the feudal system. Of course, illegal sale and mortgaging of land have been rampant, though clandestine, features of the history of rural land management in Ethiopia, to the present. No study seems to have gone into this sensitive issue whose detailed discussion might run against farmers, in which case its ethicality might also be questioned. These are important issues that need to be adequately considered to validate this overarching social theory in historical and present-day Ethiopia.

There is more to this argument and that might take us to one of the major thrust of this dissertation-culture. Even in a fully privatized scenario, land management practices depend on existing environmental knowledge, life objectives, valuation of resources, the perception of environmental degradation and many other cultural aspects of the human-environment relationship. Soil conservation and fertilization were new innovations in this

research area if we had to rely on oral history accounted for in this dissertation. Planting trees was never practiced as far as nature did this on behalf of farmers. Water is still largely held as a free resource in agricultural production. The management of livestock has always been poor in Ethiopia in spite of the fact that the country has been the first in continental Africa and the 10th in the world in livestock population. This was so not because farmers were not owning their animals privately and were not allowed to sell their animals as desired. It was so, among others, because the cultural understanding of livestock, the meaning of livestock in the social fabrics of rural life and social exchanges were not contributory to an economic management of livestock. Contrary to this, the culture has aggravated the negative ecological impact of livestock on the land. Of course, without much change in the tenure system, the land management practices of Gäddärro farmers over the years have improved and this has to do more with change in the mindset than in land policy. In a positive note, state agency and the international community of donors and western states have an important impact in this improvement though they could also be accountable for lack of fostering it in the past.

In the Ethiopian case, as far as my understanding goes, land tenure is more of an issue on state/publicly owned land rather than on land operated by smallholders as a cause of land degradation or development. It also needs to be underlined that farmers' time horizon of tenure security operates on a long-term perspective rather than a single policy perspective. This happens, irrespective of the argument that lack of private ownership affected land management or not. Secondly, towards the end of the Haile Sellassie regime, the landed gentry that were growing in rural Ethiopia was buying up the land of the poor and employing them as tenants again on the same land they owned as *gäbbar*. Such historical occurrences need to be considered in the analysis of the current land ownership debate.

So far, no social experimental research has been done on the correlation of land tenure security and land and land-based natural environmental resource conservation or degradation in Ethiopia. It seems that scholars have shied away from this strategy since it is more expensive and difficult to apply it ethically and at the same time politically in addition to lack of such training in colleges and universities. The majority of the literature agrees that the land tenure systems of the country have been discouraging the level of smallholders' investment and natural resource conservation, contributing to the current level of land degradation and poverty (e.g. Dessalegn 1994; Koehn 1977). In this dissertation the understanding is that land tenure systems in Ethiopia have been complex and probably are, as they were, more of about society than about a resource. The literature so far has been concerned with the vertical orientation of the land tenure systems in the analyses of their impacts on natural resource use or misuse, to the disregard of their horizontal orientation. Vertically, that as much as 25 to 75 percents of the total produce of smallholders' had been paid as tax and other obligations in feudal Ethiopia, is likely to have served as a disincentive for these sharecroppers to recondition the soil, to develop irrigation potential, to plant trees and to do other SWC activities. Some historical data in Gäddärro are quite supportive of the theory that tenure insecurity has depressed land development. In this regard, it is important to note that access to land and entitlement to its surplus produce, which affected the social structure of feudal Ethiopia, had also affected the level of ecological challenges and opportunities each farming household had to face. Accordingly, smallholders were put in a condition they had to degrade land and its resources than they had to conserve them.

Among some instances recounted to me in the field was the one in which a *gäbbar* was evicted from the land he cultivated after the sub-provincial administrator found out that the farmer actually had a very fertile land. The situation, as reported to me, was an excessive subservience that fired back tragically. The *gäbbar*, who was so astonished by the profuse and

exceptionally good quality of his green peppers headed with the first catch of the harvest to present them to his chief before he had to use them for himself. However, before he left the compound of the chief in Gubbisa, where he was served some food, it was said the chief sent his aides to that mysterious field to disown the farmer. In another case, I was told, a farmer blocked the spring water that was flowing in his field located on a mountain foot which he was irrigating when he knew this same chief started to pass by his field on a horse-back on his administrative tour of the areas. He did so for fear that a similar expropriation could happen to him.

At a wider scale, among these communities, it was said that everything grown on a field was taxed by the *tïkïläññа* who used to live among the villagers themselves. Therefore, it was difficult to avoid in-kind tax if a farmer planted some green pepper in a red sorghum field which they felt was not a major produce deserving tax as the sorghum produce was already taxed. At times, local elites evacuated a *gäbbar*, until it was prohibited, from his land on many ostensible excuses. Therefore, agricultural entrepreneurship was discouraged in many aspects. Such historical accounts happened along with some policy measures that were implemented to improve the tenure security and living standard of the rural population even during the feudal systems. Even though the pressure and exploitative obligations of the feudal regimes were being removed towards the end of the Hale Sellasie's period (Aberra 1994), on the whole, the feudal system had been detrimental to rural and natural resource development. Largely resulting from western influence to modernize the economy of the country, and open up the promotion of agricultural technology, the emperor's regime had even gone to the extent of planning the distribution of state domain land to the population. The Provisional Military Council of the *dergue*, which promulgated and drastically implemented the rural land reform of 1975, had brought a rather structural shift in this regard. The EPRDF government had taken measures to boost sense of ownership and tenure security. Finally, it is important to underline that this chapter does not

negate the argument that past and current land tenures in Ethiopia, despite some improvements with time, had not affected smallholders' land tenure security and the level of resource protection and investment on land. The argument that had been emphasized is that the issue is more complex than it appears and needs further re-conceptualization and research for a better academic understanding and policy reconsideration.

CHAPTER SIX: UNDERSTANDING LAND: PAST AND PRESENT

6.1 Introduction

Land is directly and symbolically enmeshed with smallholders' material, ideal and spiritual life. This chapter explores local beliefs, attitudes and values relating to land that have existed before and after land degradation and shortage were felt as serious threats to survival. Economic, social, religious, political and ecological concepts abound concerning local understandings of agricultural land and land in general, including its opportunities and constraints. These factors that cause, shape, reshape or alter these meanings and the cultural valuation of land in agricultural activities could emanate from within and from without a community. Though these meanings and cultural notions do not necessarily impact on local land resource management practices, they do generally shape or inform them. When their efficacies are affected by one or a combination of the factors mentioned above, revision and even drastic shifts could happen to these meanings and values, with further potential impacts on corresponding resource use behaviors.

In this context, the chapter presents detailed descriptive accounts of smallholders' cultural and perceptual understandings of land as cultivators, herders, residents and children of the ancestors. In so doing, it demonstrates that the old ecocentric notions have been changing towards an anthropocentric view of land and its resources. Thus, the chapter narrates how the ecological wisdom of small-scale societies has been affected over the decades because of sociocultural and ecological factors. The emerging attitude that agricultural land is also a socially constructed rather than a mere physical space is discussed as part of the local cultural shifts in understanding land as a resource. Local knowledge of land degradation, land shortage and conservation are also dealt with as part of these conceptual shifts. The symbolization of land has also undergone changes in which the homeland is viewed as a source of livelihood, identity and allegiance to once family or

lineage. Within these and many other shared cultural understandings, there have also been idiosyncrasies. Based on the theoretical approach adopted in this research, it is not enough that there is a focus just on what is shared to the disregard of what is not. Therefore, the chapter, as do many other chapters, allows due room to idiosyncratic thoughts because of their own merit and potential impact on collective way of thinking and doing.

6.2 Land Degradation, Conservation and Development

It is difficult to find a single definition of land degradation (Blaikie and Brookfield, 1987; Mesfin, 1986). Ascertaining the human impact of the problem is not less difficult. According to FAO, almost 75% of the Ethiopian highlands are estimated to need soil conservation measures of one sort or another if they are to support sustained cultivation (FAO 1986, as cited in Wood, 1990, pp. 188-9). Soil erosion continues to dominate the current land degradation discourse in Ethiopia. The problem which has been serious in some parts of the country has extended into others, rendering it a national concern. Estimation of loss has been problematic but aside from this, there is unanimous agreement that land degradation has been serious, also becoming one of the major causes of agricultural yield reduction. The economic impact of soil erosion on agriculture, however, does not seem to be clear cut even though regional differences could account for significant variation (Blaikie and Brookfield, 1987). Practically, the occurrence of land degradation as a social and natural environmental problem can hardly be disputed:

> It would be a waste of time to argue that land degradation is not a problem in sub-Saharan Africa. Common sense tells us that animal and crop production must be more difficult if the land resource is degraded, even if there is a lack of scientific data substantiating the quantitative relationship between land degradation and productivity declines. (Sundell, 1992, p. 118)

The Amhara region, largely owing to its mountainous and dissected upland geo-morphology, the outgoing Blue Nile River and several centuries of intensive cultivation, is the most seriously affected region in the country at large. According to some studies, it constituted about 60% of the national soil

loss. While the highest annual rate of soil loss due to erosion is on crop farms which is 42 tons/ha, pasture lands are also exposed to this problem at the rate of 5 tons/ha, roughly equal to the rate of soil formation (Wood, 1990, pp. 188-9). According to Adrian Wood, "This is six times the rate of soil formation, and causes an annual reduction in soil depth of 4 mm (1990, pp. 188-9). The rate of soil formation is said to be higher than that of soil erosion only on forest land, covering about just 3% of the total landmass of the country (Wood, 1990), until the 2009 when three or four times this of the land is reported to be covered by forests. Even with this improvement taken to be true, still there is little chance of adequately offsetting the amount of soil lost.

Even though it is difficult to take such statistics at face value, as Fones-Sundell said of Africa, that soil erosion is a serious abiotic stress affecting agriculture in the country is hardly contested. Nonetheless, such estimations do not take into consideration that eroding soil particles settle downstream before they are taken to where they cannot be used (Blaikie and Brookfield, 1987). On the contrary, local knowledge does this in the perception and problematization of soil erosion and fertility depletion. It is paradoxical that the level of the problem is said to have increased during the last four decades amidst huge amounts of food, cash and human resources invested on highland reclamation. Again, there is a general agreement that the last 20 years have been those of overall improvement in agricultural production at the national level even though the country is still persistently affected by food insecurity. The amount of soil loss from crop lands and pasture lands is still significant, even though scientific estimations such as reviewed above need to be cautiously approached.

The concepts of sensitivity and resilience stand out in land degradation and development. Land exhibits both natural and human processes of repair and degradation. The quality of land-based resources or land systems, as termed by Blaikie and Brookfield, consisted of soil, water and vegetation, depend on

a number of factors among which, is land form (1987, p. 10). The same writers have employed the concepts of sensitivity and resilience in order to understand these land systems in the face of human and natural processes of change. Other terms such as 'susceptibility' and 'fragility' have also been employed (Winiger, 1983, Glaser 1983, as cited in Blaikie and Brookfield, 1987) in order to express this condition. According to Blaikie and Brookfield, sensitivity "refers to the degree to which a given land system undergoes changes due to natural forces, following human interference. [And the term] refers to sensitivity to erosion as well as to other forms of damage, such as the accumulation of mobile ions (which can give rise to salinization)". (1987, p. 10)

The second term used to describe land systems quality in land management by these writers, following earlier writings, is resilience. This is defined as "the ability of land to reproduce its capacity after interference, and the measure of need for human artifice toward that end" (Blaikie and Brookfield, 1987, p. 10). Accordingly, organic matters, nutrients, soil structures and such matters, all of which are aspects of what David Suzuki conceptualized as 'the flow of matter pathways' in his definition of ecology, are naturally restored typically in a fallow setting. Blaikie and Brookfield further strengthen their definition with recourse to Holling: "resilience is a property that allows a system to absorb and utilize (or even benefit from) change (Holling 1978, p.11, as cited in Blaikie and Brookfield 1987, p.10).

The concepts of sensitivity and resilience can be applied in very diverse ways and their application in relation to land management could only be one of these possibilities. However, restricting resilience to just the natural restorative capacity of a land system following human intervention is likely to be an incomplete application of the concept. Land systems are also exposed to natural factors of change and resilience without human contact. What is more, human contact with the environment does not necessarily change it negatively

(Balee, 1998; Geertz, 1963). The more a land system is resilient, the more human intervention it accepts without having to transform to a state from which it requires some form of intervention to recuperate. By the same token, the more a land system is sensitive, the less it absorbs human intervention and the degrading forces of nature, becoming more of a concern for land resource managers, including smallholders. As a result, both natural and human forces become important factors affecting the resilience and sensitivity of a land system and resource management policies and practices.

The natural geophysical structure of the landscape affects the cultural notion of a specific space and its interaction with other environmental aspects which comprise what Blaikie and Brookfield called the land system. The same natural factor also affects the mental and sensual perception of individuals, who generally understand their environment through culture as "a set of patterns people carried around in their heads" (Netting, 1986) and as a direct perceptual experience (Ingold, 2000). Among others, the economic quality of a given land, its degradation and shortage are contingent on the specific form of the land and its spatial location in reference to the general patterning of landscape. My research has revealed that different interventions made by rural households and the state in order to supplement the natural sensitivity and resilience of the different land-based resources, have also been contingent upon these physical factors. In this relation, Blaikie and Brookfield had to say, "Usually the resilience of land has limits, and the task of land management becomes one of supplementing natural resilience with devices such as land- and crop-rotation, manuring and fertilization, the planting of legumes and a range of tillage and land-preparation methods, many of which are also linked in part to the control of sensitivity to damage" (1987, p. 11). Land forms, relief, slope gradients and the overall architecture-natural and human made-of the landscape are important factors affecting the knowledge and decisions of smallholders in Gäddärro. These concepts are applied in this chapter to analyze smallholders' TEK in relation to land management.

6.3 The Long Past and the Images of Ample and Fertile Land

Oral historical accounts from the research communities reconstructed an environment with plenty of land to be cultivated and limited number of human and livestock populations to be supported. Until before some 80 years[97], my most aged informants, Hassan Umar and Abdu Dandé (from Hulluk'o) and Ayyälä (from Awraççа), recalled, not only was the land ample as a physical space but its fertility was also so high. All cropland, grazing land, forest/bush land and land for construction and other purposes were said to be in high supply compared to the then demand, though most of the largest and most productive lands were in the hands of elites. This meant the land resources were less sensitive and highly resilient to human intervention (Cf. Blaikie and Brookfield, 1987).

According to oral history, the practice of soil conditioning as an indigenous land management technique was introduced recently, probably not more than seventy to eighty years ago. These elderly informants recalled that women innovated soil conditioning from their accidental experience of better crop performance on sites they dumped household refuse such as cow dung and ashes. Through time, they disseminated what Abdu Dandé called "the mystery and benefit of soil conditioning"[98] among the rest of the women and then their husbands and children. Otherwise, dumping garbage on farmlands was regarded as defiling the fields. This was supported by the belief that each saint that got into earth with every drop of rain to care for the seeds from germination till harvest, left, if the fields were defiled by garbage.[99] Hassan recalled a renowned sheik in the area for preventing his wife who was set to dump household waste on their farmland as saying: "In the name of God, do

[97] This period is arrived at by rough estimation of the age of the two elders relative to the ages of their children, grandchildren and historical events such as the 1935 Italian invasion. One of these informants passed away some months after I had these interviews with him.
[98] *Mïst'ir* is the Amharic equivalent of the English 'mystery'. It is one of the important local concepts through which the benefits and risks of agricultural land or nature in general are understood and expressed.
[99] Other unsanitary matters defiling fields are said to be things such as faeces and urine.

not defile my farm; you can throw your garbage away in the *wurma* [the bush]".[100] The woman went back with the stuff for fear of her husband's reprisal. She is otherwise remembered as trying to apply on her family farm the practice she learnt from the women in her neighborhood. According to these elderly informants, the lack of awareness of the old man was regarded to symbolize the "lack of wisdom" of the past. Most of the times, the past generations had been represented by the current as *"buläha*", meaning "unwise", in their relationship with the land and overall life style. This serves as an indication of diversity within TEK of even a locality and how such knowledge is filtered through time, which, also means that it is not necessarily transmitted from generation to generation.

During that time, out of abundance, according to these and other elders from Misirata and Absaro as well, mainly just plain lands were cultivated. The rest were left fallow. Wide spaces of land as bunds (*dïb* or *kab)* were left between fields as boundary markers and pastureland. No one did hunt *yäbïddïr afär* (lit. credit soils)[101] as do their children today. Thus, land boundary disputes were also said to be minimal compared to the recent past and the present. Pastureland and livestock feed in general were in abundant supply. Men simply took to the fields and came back with loads of livestock feed. That used to be an important source of feed, especially when fields were covered with crops and free grazing had to be temporarily halted. It is interesting to compare this image with just a handful of forage that people were carrying for their starving livestock during the dry spell of *bïllagi* of 2008.

It is also recalled that crop fields were sown without removing stubbles. No repeat plowing was done to soften seedbeds. In this respect, it was said, villagers used to advise each other to dig the land lightly so that the soils were not washed away by rain. The harvesting of red sorghum, a lived experience

[100] Field notes
[101] In local understanding, credit soils are alluvial silts or flood soils and sandy materials diverted into fields (humanly or naturally) and those carried onto the fields by farmers.

of many of the oldest people today, was carried out by laying the stocks flat on the field in the process called *mädälläs.* Thus, just the heads were cut and collected. The stalks and their dry leaves were left there to be eaten by animals and in the lowlands, to be burnt later as part of land preparation for the next season. Compared to the recent past and the present, my elderly informants recalled then livestock were less important economically. Therefore, it is likely that the smaller number of livestock population might have contributed to the abundance of feed in the earlier decades of the 20th century and well after that for some decades. This should however be seen in light of the 1888-92 drought and rinderpest that nearly completely decimated the human and livestock population of the area. Therefore, the turn of the century had most likely been that of restocking animals, rendering livestock feed more abundant than the period before and after the holocaust.

The two elderly men already mentioned remembered that in some places in Hulluk'o, there were dense, enmeshed bushes and trees. Among the predominant trees in Hulluk'o and the rest of the villages, including Absaro and Awraççа, were olive, junipers, acacia and *säggäd* trees. The tree, *kïtïkkïtta,* was said to have been wide-spread like today's eucalyptus tree. Another bushy tree, *k'änït't'äffa,* with its hooked thorns, was remembered as a real impediment passing through the vegetated environment, especially in Hulluk'o. One of them, Abdu Dandé, recalled, "The forests were dense. It was not possible to drive animals through them and in fact there were no many animals here".[102] According to these and other elders from Absaro, Mïsïräta and Awraççа, livestock started to be economically important since the period of Emperor Haile Sellassie I. Their saying "An ox was enough [to be paired] to plow the fields of four or five households"[103], reflects a simple form of agriculture and relatively ample land.

[102] Field notes
[103] Field notes

Elderly women I interviewed remembered that women and young female children left home and came back with loads of fire wood from Gäräk'äfo, Hat'ät'i, Lägäwwašä, Kukummi and other places within their locality. Naturally drying trees, branches and leaf droppings were in high supply such that bushes were not cleared and tree branches lopped, leaving alone standing trees. In the first decades of the 20th[th] century, wildlife such as leopard, *midak'a,* hyena, ape and bushbuck used to exist in better quantity in these and other vegetated areas. Monkeys, remembered for their notorious attack on field crops and smaller animals, have become things of the past. As a result of the shootings from the northern civil war which ended in 1991, local residents recalled, the monkeys have run away and never came back.

Most of the fertile lands, including hills, bushes and forestlands were owned by the *balabbat* (landlords) and their collaborators whereas the *gäbbar, naim* and other sections of the communities owned comparably smaller and less fertile lands. However, there were openings allowing the latter access to graze their animals and cut woods from the lands held by the lords. The *gäbbar,* as a tax-paying class, had also access to enough land until re-division among successive generations caused its scarcity. Even those who used to own small land not enough to support their living or did not have any at all, were not at a complete loss. Different sharecropping arrangements, it was said, allowed such households access to some land. One of my informants remarked, as far as one had these opportunities to make use of, it was enough for a man to possess a small patch of land he called "seat for the bottoms".[104]

On the whole, in the long past, not only the land and the resources on it were ample, but they were also 'healthy' as related to me by these elderly informants. The notion of health is pervasive in local representation of past land.[105] Nowadays, it is widely complained that the land has fallen sick. I remember what a farmer sitting next to me in a public transportation bus I was

[104] Field notes
[105]This is also true to past soil and, of course, rain, as shall be treated in the next chapters.

boarding in August 2007 from the town of Haik' to Bistima had said. As we began a discussion about the environment, he remarked that the land was sick, spitting off the water it should have swallowed. We were crossing the plains by Lake Haik' and heading up the hills to climb the formidable chain of mountains on which the small town of Bistima is saddled. Being vertisols, the soils in this part of the district have low water permeability, which, coupled with the swamp and the cooling effect of the lake nearby, could render a reasonable amount of rainwater, excess. Of course, the FAs in that micro-ecology are those to which the district Agriculture and Rural Development Office had distributed some Broad Based Makers to help drain the excess waters. In this area, for the same reason, the land is also tilled across the contours as against with, as in the rest of the district.[106] It was, then, in reference to these water-logged fields on which were stunted sorghum and maize crops, that the man in the bus made the remark. At about the same time, I had heard the same remark of the land falling sick from an old man I accidentally met at the Goha marketplace, a small countryside near my ethnographic residence. It is interesting to note that there are many other ways in which the image of a sick environment is invoked. One among this is that compared to the present, there were fewer crop and livestock pests and diseases in the long past.

[106] Perhaps, this is a recent innovation, started over the years because of the decrease of vegetation cover and over-cultivation.

Plate 2: Partial view of Bistima town

6.4 Land Forms and their Agricultural Impacts

Sensitivity and resilience are among important concepts related to land perception in Gäddärro (See 6.2 above for their description). This section further discusses these concepts along with local knowledge of land forms and their agricultural significances.

An elevated, dome-shaped land, locally known as *gora* is not conducive to agriculture because of its steep slope. As in the Gäddärro Massif, there could be several *gora* within a single mountain or parts of a mountain. Owing to its topography, which does not facilitate rapid natural replacement of soils, this form of land is qualitatively poor. *Gora* is mostly dissected by *šïntärär* (streams) or cleavages and is thus highly exposed to erosion, mostly during torrential rains. Thus, in local theory, *gora* is not convenient for farming. Regardless, until a recent government restriction, many *gora* lands had been

cultivated with growing shortage of land. Even then, local knowledge goes that the disadvantage has been more than the advantage. In its most negative sense, my informants remarked, it might not be conducive even to grow trees. Its physiographic appearance also renders it less conducive for rehabilitative and conservatory measures. According to my informants, during rains, it does not get dumpy. Among the trees that mostly grow on *gora* are acacia, junipers, *kitikita* and *agam* (*Clarissa edule*). Usually, it is also the home of several smaller plants and shrubs. According to local knowledge, the reason there are relatively more species of plants on it, is that it had been less cultivated most of the time because of difficulty in accessing it. Before government restriction, the communities also used such lands to graze their animals and fetch fire wood unless prohibited by very difficult topography. Comparatively speaking, according to local knowledge, such a land is most affected by hailstorms. Culturally, this raised land is believed to be the pillar of the Earth.

A well-elevated *gora* is preferred as a recreational site during hot weather. Socially and politically, it is the most preferred location as a residential site not only because of ambient weather but also security reason. Those living on *gora* are said to be better situated to defend their enemies. Therefore, attached to such land forms is economic and ecological vulnerability, while politically, socially and aesthetically, they are appreciated. A *gora* can be found on plain and low-lying landscape as well. The settlement pattern of these communities relative to their agricultural land, among others, has been affected by these advantages of *gora* land. The need to locate homesteads on *gora* might have contributed to the cultivation of marginal hill lands but also their fertilization. According to local knowledge, this land is highly sensitive and less resilient to agricultural activities, especially cropping.

Zäbït' or godïguadda märét is a low-lying or valley-bottom land. Hence, most of the rains that pour on it are retained, resulting in high precipitation and moisture retention. The rate of soil erosion on such a land is also said to be

quite minimal. Again, if manure or chemical fertilizers are applied, the investment is said to be more rewarding as the inputs are not washed away by erosion and there is enough moisture to utilize them. This is land which knows of just receiving from other landscapes, and largely retaining to itself what is on it and what is received. According to farmers, when the original and the newer imported soils mix, the result becomes remarkably productive. As a result, it is not only fertile but also has a high topsoil depth. My assistant, Yïmam, compared the good quality of such soils with spiced food. This land is also easily workable, rendering it among the most desired for agricultural activities. During drought, it still gives harvest because it can retain moisture longer. Of course, as it has some tendency of water logging, its harvest is reduced during seasons of heavier rains. Young trees planted on it could get covered and stifled by the silts coming down from the surrounding higher slopes unless protective structures are developed. In local drought/famine narrations, such places are represented as parts of the landscape that created the images of oases in a desert since they are less sensitive or highly resilient to drought. Security wise, this land is the opposite of *gora* discussed earlier.

Méda, which is 'plain' or 'level' land, is among the most preferred for agricultural activities. Such a land is less exposed to flooding most of the times. Alluvial soils washed down from upland and nearby hills could accumulate on it, thereby further enriching it and sustaining moisture content for several months, also rendering it more resistant to drought. In case of too much rains, the waters need to be drained away to prevent water-logging and yield reduction later on. In local poems, humans' qualities of tolerance and perseverance are applied to exemplify its economic significance. During fieldwork, I had heard the term *méda* being frequently mentioned in their day-to-day language about their environment. It might, however, be interesting to note that the landscape called plain by this cultural standard might not be so by others. This might suggest that language, an important aspect of culture, could shape the landscape inasmuch as the physical topography shapes the

culture of a group of people (Cannon, 1994; Hornborg, 1996; Maturana and Verela, 1987, as cited in Hornborg 1996). Hence, this contributes to the generalization that the perceptual and cultural understandings of the environment are affected not only by the bio-physical environment but also their symbolic representation. This generalization is further supported by other findings in this research. In terms of sensitivity and resilience it is nearly comparable to Zäbït land.

It is important to note that local environmental knowledge underlines that a land is not necessarily much productive merely because its topography is flat. There is a land that does not receive soil from other places which means it is quite plain and perhaps lacks tributary uplands in its surrounding. Such a land has a reduced chance of trapping and retaining transported or 'stolen' or 'borrowed' soil particles (as farmers call them) and other decomposable substances even if runoff water and soil are brought onto it from other places. When there is rain, it might also not absorb the water adequately for reduced water retention and moisture absorption capacities. Therefore, for lack of enough soil to allow deeper roots, crops growing on it could be less productive. Villagers said that such a land does not have '*bitamin'*, (that is to mean it lacks the necessary nutrients to support crops well).

Tädafat märét is an inclining or gently sloping land with a considerable degree of susceptibility to soil erosion by water. In order to make good agricultural land out of it, it is of high importance that such a land is protected by different SWC schemes. Owing to its topography, this land is also considered susceptible to denudation, especially if it is exposed to much physical contact by humans and animals. Local knowledge, irrespective of practice, is in favor of leaving this land fallow as an environmental measure. Thus, it is more sensitive and less resilient to human contact.

Wänz is a land along a river or stream. The term literally means a river in the Amharic language. In its local use in Gäddärro, in addition to this, it is applied

to refer to a narrow valley or valley-like depression extending at some length between mountains, hills or uplands. It could also refer to seasonal streams and the area along them and of course to any river or stream course, whether flowing or dry. *Wänz* in the past used to be a very important natural waterway to drive out excess water from the fields in quite socially involving relay process among upstream and lower stream farmers. Such river-loving trees as *šola*, *wanza*, *birbirsa*, *bäd'd'essa* and *wäléns* are said to be the ones usually growing on such places.

T'ägata märét (foothill land) is that lying about the foot of a mountain, hill or raised surface of land, including a cliff. As a result of its high slope, it is more exposed to soil erosion. It should be protected by bunds, terraces and other conservation structures to be cultivated. Therefore, its high slope gradient renders this landform a less favored space as a farmland. Nonetheless, as already mentioned for *gora*, another marginal landform, out of necessity, farmers have been forced to cultivate such a land.

It has already been stated that the farmers in this research are among the 88% of the population of the country inhabiting about 43% of its landmass. Even within this highly populated category, the research communities are among those who inhabit the most mountainous, drought-prone and erosion susceptible districts. Thus, most of the farmers largely cultivate land which should have been left fallow or used for other purposes such as tree planting. Ambient temperature for human habitation, fertile soil, reliable rain, and the politically strategic advantage of the uplands had been among the reasons for long habitation and intensive cultivation of this part of the country. Due to gradual exploitation of the land and its resources that have extended for centuries, all the same, the region has become the most environmentally degraded part of the country. Agricultural use of land has been tapping the land resource of this region over the centuries and the landscape has been transformed by different use practices. It is reasonable to think that the

different geophysical factors discussed above among the research communities are also true to a larger spatial scale covering the entire Amhara region. The next section is devoted to describing and discussing TEK about land use types and their interaction within the agricultural cycle.

6. 5 Land Use Cycle, Land Degradation, Conservation and Development

6.5.1 Major Land Use Types, their Interaction and Use Cycle

From Chapter One, we already know that cropland, grazing land, forestland, bush land, scrub and "waste" land form the major land use types in Gäddärro and Wärräbabbo as a whole. Based on cultural and natural factors, there has been quite dynamic interaction among these land use types, including those considered in the preceding section. Spaces that served as sources of meadows and grazing land just a few years ago have been converted into croplands. A cropland that hosted mono-culture or a couple of crops before three decades has been converted into one serving a poly-culture. Lands that were covered by annual croplands have been replaced by perennial tree crops, mostly *çat*. I have observed several rugged hills in my ethnographic villages and their surroundings, which, I was told, used to be plain or gently-sloping spaces plowed just 10-30 years ago. Following over-cultivation, over-grazing, denudation and erosion, these places were converted into steep slopes, gullies and were ejected from the pool of cropland and converted into grazing land till their prohibition by government regulation some years ago. I have observed old trails of plow tips on hardpans left decades or years before, as the land was tilled to its bones. I was told that before about 30 years, the Adami or Hat'äti mountain used to have some level or plain-like landscapes but now it has been rendered very steeply.

It is important to note that it is also a matter of age-old local knowledge that a degraded land improves quite well when it is enclosed or left fallow, even though no land is believed to go back to its original *status quo* (Cf. Blaikie

and Brookfield, 1987). Generally speaking, the historical condition is one in which croplands, grazing lands, forest lands, and home sites interacted and were converted into one another. This has happened as a result of the dynamic processes of economy, politics, culture and ecology. As a result of this, local farmers view their farming systems, their natural resource endowments and constraints, the land tenures and political systems and the overall factors that engender farming, as quite interlocked and continually changing (Cf. Balee, 1998; Kottak, 2006). Part of this change and interaction has already been captured in the forgoing chapters.

According to local knowledge, productivity is a major parameter upon which the value of a land is judged. Along this line, the degree or level of human intervention on a specific land is applied as an important conceptual tool to understand land and soil resourcefulness. Accordingly, a space of land could be "virgin land", meaning it has never been cultivated, most likely bearing the most fertile soils agriculturally. When such a land is cleared, if need be, and plowed just once or twice but not yet ready for planting, it is known as *dïbbïb.* Mere sight perception is enough to identify for farmers such a land. Such a land, which is about half prepared, is further plowed and softened for seeding to be called *k'ïbïk'ïb*. When this land is covered by crops from the first sprouts through the collection of the harvest, it is identified by the name *azzärté*. From the time harvest is collected till the first plowing in preparation for the next season's planting, that is the inter-season fallow, the land is referred to as *k'urän.* Traditionally, this has generally been the period during which livestock were freely grazed in the stubbles and farmers maintained and constructed SWC structures in their fields. Then, the land is plowed once more as the beginning of land preparation for yet another season to come, rendering it *dïbbïb* all over again.

The cycle continues till such time that the fertility of the soil is totally exhausted and its return is found to be uneconomical for crop production. This

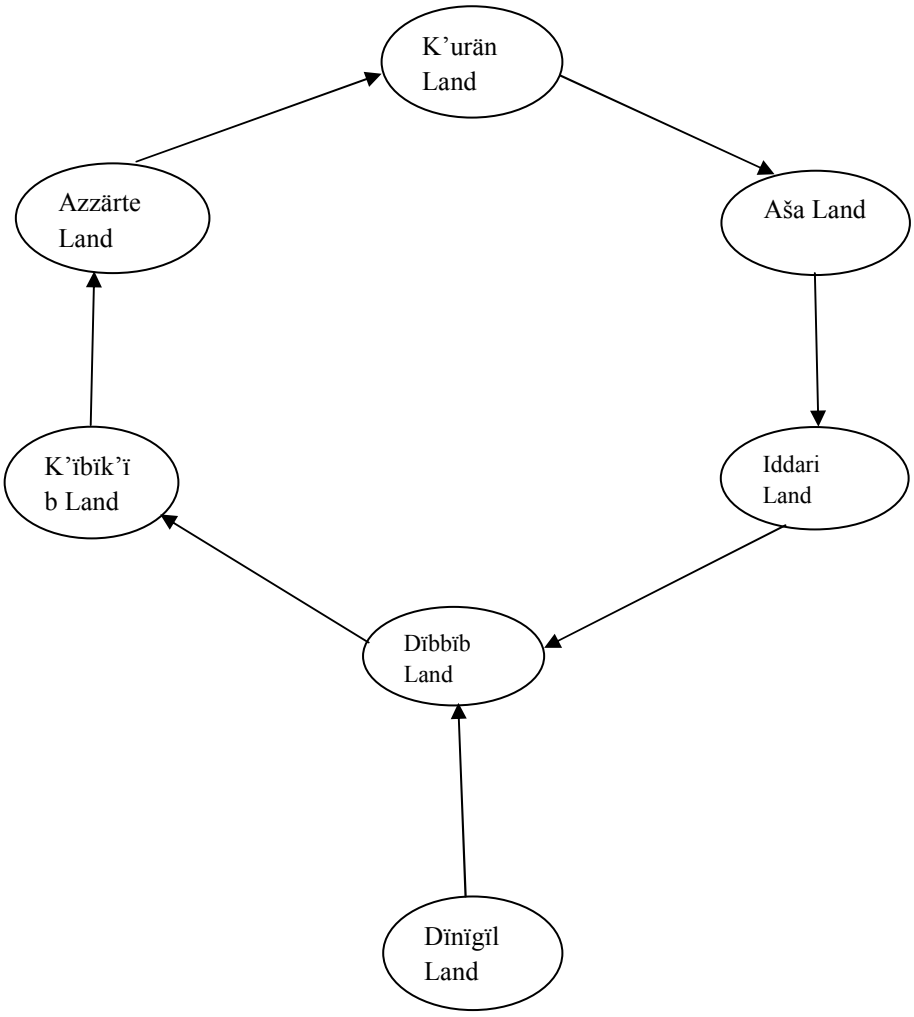
is the time that farmers, depending on some other factors as well, such as total landholding size and household economy, decide to let the land lie fallow for some years, as it was generally done in the past.[107] This resting period might or might not be considered as ejecting the land out of the agricultural cycle, depending on how the issue is approached. Such a fallow land is known as *ïkkir* or *aša* land after a year or so, when it develops overgrowth and gives the impression that the owner has stopped working it for some time. Traditionally, after some three to five years of resting period, such lands regained their fertility 'enough' to cultivate them once more, pulling them back into the agricultural cycle in proper sense of the term. When this land is left for more years and is converted into a meadow land or grassland, rather than cropland, it is known as *iddari*. At any given moment in the future, the owner could re-draw it into the cropping cycle.

Plate 3: Harvesting hay from an ïddari land left as a source of livestock feed in Awraççа

[107] This is comparable to the theory reviewed by Wolfe and colleagues (1992) in which diminishing return ultimately forces resource users to resort to unconscious protection of natural resources from further degradation.

Most of such lands have been made so over the past years. During my fieldwork, I had observed some farmers practicing this. Today, though comparatively smaller, there are farmers who have *iddari* land as a part of their strategy to cope with the growing shortage of livestock feed, including communal grazing land, which is no more now.

Figure 4: Schematic representation of the land use cycle



It might be assessed that these farmers have tree notions of the practice of fallowing. The term *makkär* is apparently used to refer to all the three types of fallowing. The fallowing which is specifically called *aša* is a short term fallow even without allowing full re-growth of bush. As far back as the current older

people remember, roughly about 40-50 years ago, when land was still in relative abundance, villagers used to leave their fields uncultivated for three to five years such that they regained fertility, perhaps also developing some bush re-growth. The second type of fallowing, known as *andalläf*, involving a fallowing of just a single agricultural season or year, was introduced when the scarcity of land was becoming serious. Nowadays, these fallowing techniques are rare practices. What is there is the practice of allocating a small patch of land as a 'permanent' grazing to lessen forage scarcity. A given patch of land is ejected from the cropping system when it is overused and could no more be economically rewarding. This land, already referred to as *ïddari* does not involve a conscious human act to recuperate it, the practice might not be called fallowing in proper sense of the term. Through time, such a land, which perforce is ejected out of the farming system, is becoming economically important because of tree planting, especially eucalyptus trees which were imported from Australia. As such, the meaning farmers have of degraded land is changing without biophysical changes involved in the degraded soils. The interrelation of the cultural with the ecological as people fulfill their purposes and goals in life (Ellen, 1982; Moore and Myerhoff, 1977; Turner, 1985, Squires, 2004); the reflection of meanings in environmental behaviors (Ellen, 1982) or the process of adding new signifiers to old signifieds (Turner, 1985) are reflected in here strengthening the cultural constructionist theory adopted as a theoretical strand in this dissertation. (I will return to this issue when I deal with additional technical responses to land shortage in Chapter Eleven. Also discussed are the roles of government and the international community in the natural resource management of traditional communities in an aspect understood as diffusion by political ecologists.)

The forgoing description is also an important part of local environmental knowledge. In the first place, humans are understood as active agents of environmental change and degradation and this depended on ecological factors as well. Secondly, changes that occur so are not necessarily

environmentally degenerative (Balee, 1998). Or, if at all humanity degrades land, it has also the capacity to develop it. Virgin land, a form of land type, in the schematic representation, is mentally perceived as the original status of land before human intervention. As far as local ecology of land is concerned, such land never existed in the recent history of Gäddärro since every part of it is believed to have been subject to some form of human contact.

6.5.2 Land Degradation

The root of human agency in land degradation among the communities I studied is conceived to begin with the primordial farmer, Adäm (Adam), who cultivated land for the first time as he and Hawwa (Eve) were expelled by God from Heaven to live on their sweat. The story was narrated by one of my key informants in Awraççа, Bäkär Sämman, aged about 70, amidst a men's group discussion. The story is represented as follows:

> When our father [Adäm] left *Ğännät* [Heaven] he was given two oxen named Haloyyé and Mäloyyé as a *goğğo mäwïča.*[108] It is beginning from that a father now gives *goğğo mäwïča* to his children. He [Adäm] was given wheat seeds along with the oxen and Ğibril [Saint Gabriel]. Now it is to symbolize this, that they give us wheat grains when we face hunger. The Mäléika [Saint Gabriel] taught Adäm about all the farm implements and how they were operated. He also told him that all his descendants will have to live this way. Then, Adäm got the oxen engaged with the help of the Mäléika. He started driving the oxen. The *qädäma* [the furrow] was incredibly very long. Then, the Mäléika told him to stop: 'you have to stop here; this is the boundary. There are your descendents to come in the future and this will be theirs'. He stopped. He [the Mäléika] ordered him to turn the oxen. He did and stopped when he reached his starting point. Then, he made the third turn and when he reached the end of the *qädäma,* the Mäléika told him to disengage the animals. He did. It was said Adäm got a 1000 *däwla*.[109] Up on this, the Mäléika came and talked to Adäm. 'Adäm, you got your harvest; yes?' I got here because God has sent me and He is saying 'let us share the harvest'. [Adäm inquires] How? [The Mäléika replies] 'If you got a thousand *dawïlla*, God said,' '900 of them belong to me and the remaining 100 to you'. Up on this, Adäm was so much disappointed and proclaimed

[108] This is a customary start-up asset given by parents to their marrying out children when they leave their families and start up their own.
[109] This is a traditional grain measure. A *däwla* is equivalent to 80 kgs.

'I do not want anything, take it all'. The Mäléika got back and told God 'he has not received the words from me and he was disappointed so much. What shall I do?'

Then, God told the Mäléika to get back and tell Adäm 'to whom do you belong, who owns the land and who owns the oxen, too? What have you to be disappointed? Tell me?' When the Mäléika told this to Adäm, Adäm was scared. The Mäléika was also told to tell Adäm 'if so, you take the 900 [*dawïlla* of the harvest] and give me 100 but get me a guarantor that you will do this [in the future as well]. The Mäléika told him this and Adäm became very happy. He also told him that God had demanded him to produce a guarantor so that he will not default in the future. However, all the Mäleika declined to be his guarantor. Upon this, the earth volunteered to be his guarantor. She was asked how? The Mäléika told this to God and He said all right. That is how Zäkha was emerged. She [the earth] said 'unless he [Adäm] paid me 10% of his harvest, I will not show him my secret [yield, harvest], too. If he does, I will'. Then, Adäm and his wife took 900 *dawïlla* of the harvest. The next year, our mother Hawwa, said to Adäm when he was going to disengage the oxen after plowing three *qädäma,* 'last year it was just you and me, this year we have two children born, you need to plow more, how you stop just by three [furrows]? Adäm did three more *k'ädäma*. Nevertheless, the harvest was reduced by 500 *dawïlla*. The next year [the third], they plowed more and the produce again decreased. You know? If they now give me [village] Awraççа, I want to add [village] Absaro, then Binné and so on.[110]

A number of interpretations could be made on the basis of this story. In the first place, environmental degradation is implied to have started with the first descendants of humans who toiled to get their wherewithal from nature. This means that the degradation problem existed before humans were multiplied. Thus, unlike some scholars who hold that humans do not necessarily degrade the environment, the story represents humanity as inherently degrading. This might be compared with the local knowledge that the ancestors of the long past in Gäddärro did degrade land and its resources even though there was no resource scarcity. The continual yield reduction faced by Adäm and Hawwa after they begot children, in spite of their efforts to boost production might be interpreted in two ways. Even though it might be possible, as already said, that degradation started before population increase, the impact of population is foretold by Hawwa who enticed her husband to till more land after begetting children. Secondly, it is clear from the story that the urge to produce more was

[110] Interview transcript

not basically caused by the actual need of sustenance or shortage of resources. Hawwa's concern, in this respect, is unlikely to be supported by the need to fulfill the requirements of survival. Their first produce and even those which were subsequently decreasing were enough for them to trek for several years. As Bäkär made some interpretation towards the end of his narration, humans' unbridled material lust is suggested in the story. Regarding this interpretation, the story seems to be more of the present and the future than of the past of the environmental history of the people of Gäddärro. We know already that their long past ancestors are blamed for adopting simple life, accomplishing just the minimum requirement of life.

Adäm's disappointment over the requirement to submit the lion's share of the produce to God might be compared with an irresponsibly possessive behavior of taking from the land without giving back to it. The lack of soil conditioning and of tree planting and other detrimental resource use practices already documented of the past generations (section 6.3) appear to go well in line with this interpretation. We might also want to ask "Why was Adäm required to provide a guarantor to pay back a tenth of a produce?" One probable answer is that he was already a suspect and there had to be some external pressure to have him behave properly. Commitment without enforcement is difficult. This could be seen in light of local knowledge that government policies and regulations that prescribe farmers to behave in certain ways towards the environment are mandatory external interventions for a peaceful use of resources. This contradicts largely with the theory of the state (e.g. Bryant and Bailey, 1997) in relation to resource use reviewed in Chapter Three but largely goes in line with Scruton's position, "We need free enterprise, but we also need the rule of the law that limits it" (1993, p. 8). On the other hand, it reveals the ambiguity that exists on the perception of governments in environmental resource management. As the different interviews I made with men and women had revealed, it is also important to note that some villagers acknowledged government intervention on natural resource use as beneficial

to the natural environment, and not to them. Of course, some farmers openly stated that the restriction on free grazing has negatively affected their very source of sustenance.

A possible symbolization of the earth in the narrative is nature and the force of nature. In this regard, it might be thought that the story suggests the ultimate submission of smallholders (and humanity at large) to the force of nature even though they have behaved for long as if their natural resources like soil were inexhaustible. As the discussion in a forthcoming section has it, these smallholders have to pay *Zäkha* after every harvest in order to have earth give off yield or its 'secrecy' or 'mystery' as narrated in the story. The old local interpretation of *Zäkha* in relation to land was just spiritual as it was believed that the land got happy when its fruits were given for such people as orphans and the aged. Thus, this interpretation did not involve any secular relationship with the productivity of land except in a spiritual way. This notwithstanding, I have encountered many farmers who believed that rehabilitating and conserving land by such means as fertilizers and bio-physical conservation measures are also part of the *Zäkha* requirement to the land. In this regard, an existing cultural resource, which is the story, is re-employed to understand and justify largely a new form of environmental behavior or requirement. This goes well in line with the theory that treats language or meaning as an important aspect of ecological relations (Cf. Hornborg, 1996; Maturana and Verela, 1987; Milton, 1993; Sahlins, 1976). Therefore, the story is not only about degrading land but also about the need to rehabilitate and conserve it.

Local belief is that God created earth and everything on it. Their empirical experience of the landscape depicts that humans have changed the face of the earth in terms of vegetation cover, geomorphology and in many other ways. In reference to cropland, it is said *märéttïnna sét yalk'al*, to mean "land and women wear out"[111]. While different terminologies are employed in reference

[111] Field notes; interview transcript

to the depletion of soils, trees and water, the indicators employed for the concept *"yakkababi mämmänamän"* that is 'environmental degradation' could also be understood as land degradation. Clearing forests and growing expansion of deserts or increasing temperature, soil erosion and fertility reduction, and too much rain or drought are among the major local indicators of this concept. Moreover, farmers' perception of land degradation now is felt in terms of wearing out soils, sinking landscapes and outcropping rocks and boulders. A rough estimation I made with some farmers about some of the gullies that formed along footpaths resulted in about a 10-centimeter deep loss of soil per annum. Over-cultivation, over-grazing, deforestation, flooding, landslide and denudation are also known causes of soil erosion and hence land degradation. This is part of the technical scientific knowledge (Cf. Blaikie and Brookfield, 1987) discussed in sub-section 6.3 above.

As far as it could be understood from oral history, it is during the last half century that these problems began to be felt as serious challenges to their age-old ways of life. In the long past, local explanations are that the low level of human and animal population and simple life style, among others, slowed the level of degradation and its perception as in the theory of culture reviewed in Chapter Three. Following political and historical ecology, one can add, among others, lack of market to stimulate cultivation depressed the socioeconomic and epistemological base needed for intensive cultivation of the land. Therefore, concern for land degradation was said to be out of question in "the good olden days" (Again see section 6.3 above for detail). It was also possible for a group or community to move from crowded to less crowded or unoccupied places as did the Gäddärro ancestors during the second half of the 19th century. This is likely to have given a long fallow period for a degraded environment to be evacuated and resettled.

Before there was serious land degradation, it could be said, nature conserved land and other natural resources for humans. Only when population 'pressure'

and ‘excess’ resource use passed the threshold did the concern come for land shortage, soil infertility and the rest of the ecological problems still faced. According to oral history, even the practice of land preparation and weeding were so late to emerge. Therefore, because of all these factors, there was low awareness of land degradation and the need to conserve and develop it during much of the period after the Gäddärro ancestors occupied this place. This point of view could be well substantiated with recourse to some historical comparisons. For instance, as already mentioned, there was no culture of tree planting because nature supplied them in ‘profuse’ manner. Contrary to this, their current descendants, who grappled with this culture for certain period, are nevertheless, in a growing tree planting culture. This practice has added value to the land. Tree planting has been also contributing to reducing runoff and soil erosion. I shall discuss in the next chapter that the correlation of land degradation and productivity or production reduction is not necessarily causative in farmers’ understanding.

6.5.3 Land Conservation and Development

Past human action that has modified the landscape has also led to a change in the symbolization of land as well as adaptation to the modified land itself. Some smallholders even accuse their ancestors of leaving the current generation “on the stubbles”, *(ïk’uränu lay näw yättäwun),* a charge connoting not only scarce but also degraded land, infertile soil and reduced agricultural yield. The ancestors are represented as ones who used the land unanswerably with no concern for their successors. Accordingly, local historical accounts I have found about land conservation and development are limited and recent, though, as we already saw, the above mentioned story is not only about degrading land but also about conserving it. It has also been said already that the Gäddärro ancestors generally lacked a tree planting culture. Or, more justifiably, they were not faced with the need to do so until the recent past in their history. The local saying *“märétïnna sét yïttadäsal”* to mean “land and

women are renewable" seems to be a central knowledge about the conservation and development of land. This could be analyzed as an extension of human's domination of nature into men's domination of women. The saying also epitomizes men's conception of land development, if not also women's. Despite their diminutive tone about women, this and the like sayings, as part of languaging the environment (Hornborg, 1996) could be considered as cultural resources that have emerged over the years in relation to land as farmers modified their meanings of these resources to fulfill their needs (Moore and Myerhoff, 1977; Shultz, 1967; Turner, 1985). Even though it is difficult to guess when such lore emerged, most probably their intensive use is associated with the growing problem of land degradation and the need to rehabilitate and conserve it. These findings epitomize the return impact of nature on culture, in addition to the projection of language on nature or the environment.

Crop rotation may be the oldest conservation practice as my informants did not remember their ancestors' not doing it in their oral history. Today, no land cultivation is conceived of without crop rotation, even though, depending on local soil condition, this technique alone might not guarantee good production. Traditionally and as currently practiced, leguminous crops are interspersed between crops that do not have the quality to fix nitrogen to the soil from the atmospheric air. Such crops as red sorghum and teff have been described by nearly every farmer as very depletive of the fertility of the land. They are called *"yämärét nähas"*. Hence, such crops have been rotated with pulses such as horse beans in a process locally called *makkär*.

The Amharic term *mänkäbakäb* which could be translated as caring or protecting is generally employed to refer to individual farmer's duties in rehabilitating, conserving and developing the land. This includes such activities as constructing SWC structures and applying manure to renovate weakened soils. The term *lïmat*, is the Amharic word for the English

'development', yet largely applied by villagers to refer to paid public labor as in tree planting. Family resources invested on individual holdings are not considered as *lïmat* as in the official sense. Rather, the term *käsb*, literally work, is employed to refer to family and individual labor and investment on private holding. Nearly all of my informants said that they manage their land better through different techniques than their ancestors did. It is often mentioned that the forebears did not exploit the land for lack of plan and knowledge. Today, in addition to what is already mentioned, it is common knowledge that among the solutions to environmental degradation are halting free grazing, not cultivating hill sides and other marginal lands. This local lesson is derived from the long-standing back lash of nature as well as government and international community interventions since the second half of the 1970s.

During the time of the *dergue*, the chairs of Gäddärro and 08 FAs evicted individual farmers from mountainous areas on their own measure and gave them replacement land in other less degradable areas in their respective FAs. The land thus evacuated was planted with trees through forced public labor and the trees were protected as full-time guards were assigned for the purpose. After some years, the mountains were covered with trees of eucalyptus and junipers but during the 1991 power vacuum (when the *dergue* was dismantled and the TPLF-lead EPRDF took power by force) in the country, most of the forests, including others, were cleared by the communities themselves. This case represents how individual personalities could bring positive changes in the rehabilitation of degraded environment at local level without intervention from higher state authorities. It also supports the proposition of the tragedy of the commons. There has been gradual improvement in the interlude. As a result of environmental conservation activities, the predominant local view is that the vegetation cover today is better than what it was after that destruction. Communities, government and concerned development agencies should strive more for better results.

6.6 Who Owns Land? Who Cares for It?

Among traditional societies in Ethiopia it is almost a universal belief that land belongs to God. Nearly invariably, nonetheless, smallholders in Gäddärro are hardly astonished when they are made to pay tax for its use. Dissatisfaction and sometimes uprising over excessive taxes and dues were not rare in Ethiopia but there have not been evidence that farmers refused to pay land tax because land belonged to God. Emperors and kings as well are likely to have shared this widespread notion even though it did not restrain their pursuit for land, taxes and dues. One of the kings who ruled Gondar province for 27 years was documented to have once said that while the land belonged to God everybody was responsible to pay him tax because God has bequeathed all the land to him (Pankhurst, 1961).

During my fieldwork, I did hear many people say *"sét yalänika märét yalägïbïr ays'änam": "it is difficult to have a woman as a wife for long without leading her to the altar so much so that it is difficult to have a secure ownership over a piece of land without paying tax for it".* Actually, being able to pay land tax in one's name is considered as a source of pride and, to some extent, tenure security in relation to relatives, the village corporation, the FA administration and the government at large. Paying tax for land is also considered a privilege, a way of emancipating the self from the need to be enslaved by others. What is more, establishing direct contact with the state as a tax-contributing person adds on the sense of citizenship and respect of a person.

I have also come across local exegetes who were more critical. Emphasized by these persons was the role of the state in maintaining law and order in land ownership and use. To this effect, it was considered legitimate and essential for the state to intervene in land ownership and management. It was feared that communities would end up chaotic if the state withdrew its hand. For communities like Gäddärro and the rest of Ethiopia, where farmers had a bad

legacy of spending a considerable portion of their productive times for court litigation over land disputes (legitimate and illegitimate), sometimes covering journeys of days on foot, the role of the state in this regard can be but of crucial importance.[112]

The history of the land tenure systems of Ethiopia has been the subject of study for a great many scholars. As already discussed in Chapter Five the land policies of the feudal systems and those of the two governments later on have drawn much academic and political debate. This unresolved debate has been revolving around state versus private ownership of land. On the part of the communities I worked in, the issue of who should care for the land in economic, material or ecological terms has not been significant. According to tradition, quite limited land conservation and development techniques were employed such as fallowing, terrace building and crop rotation. The concern for land had been rather centered on fulfilling different agricultural rituals before planting, during threshing and at other moments to ensure its fertility, to ensure that the rains continued well and the pests were kept at bay, or destroyed, if appeared. This was in addition to the effort to secure and maintain land by all legal and illegal means that were justified anyways.

There was no demand on government to fulfill either these spiritual or the technical requirements of conserving land. Accordingly, success and failure were largely explained in religious terms to the disregard or less regard of the techniques of managing cropland, pastureland and bush/forest land (See Chapter Four for discussion on traditional and modern mindsets of agriculture). Therefore, in technical sense of the term, it was enough if farmers fulfilled the minimum requirements placed by the norm in planting, weeding and harvesting. Thus, due to this tradition, communities and states

[112] Such claims to land were documented for highland Ethiopia by James McCann as one of the strategies for the agricultural success of newly formed households in addition to marriage endowment and initial landholding (1998, p. 292).

were exonerated largely from the responsibility of caring for the land and developing the agricultural sector through 'modern' inputs, credits, new technologies and advices. These services have been tried only over the last half century in the case of Ethiopia and over the last thirty years in the case of lately receiving communities such as Gäddärro. Today, the amount of production to begotten from the land is less reliable compared to the past even though the productivity of a unit of land seems to be improving. Therefore, the symbolism of land as *aténa* or *ma'ïd* (see section 6.10 below) looses much of its efficacy when evaluated in terms of food self-sufficiency at household or community level. For the past many years, the international community has been making up for food shortages encountered among these communities. The credit is nearly exclusively given to the state. On the part of communities, there is a sense of how could have we ever gotten access to these resources if it were not for the government which placed the appeals every year. (This issue is further discussed in Chapter Twelve together with the sociocultural changes it has involved).

I have already mentioned, the long past for the people of Gäddärro was one in which land resources were abundant and the population in need of these resources small. The past was also one in which people's demands on land resources were insignificant in the face of the affordance of their immediate natural world. Due to these reasons, there was a strong value to cultivate only plain lands or lands that were not hills. There also used to be, though not a very strong one, a social sanction discouraging people from cultivating hills because this exposed the land to serious erosion. According to my informants, the qualifier *"dagät araš"* (hill farmer) was derogatorily given to those who ventured upon tilling the hills. These early transgressors were also considered as lazy farmers, primarily for lack of conservation structures that they failed to build to stop or prevent erosion on hills. Through time, however, more people started to breach the value, and after a period of breaching and resilience, the custom was ultimately changed from one which did condemn hill farming to

one that tolerated it and then to one that valued and vied for it. This is typically present-day Wärräbabbo before state intervention to mitigate the problem. The early transgressors, in spite of the damage they caused on the land, were able to collect bumper harvests for the first two or three years. Partly because of social pressure and partly because of declining harvest, they were forced to leave hill lands fallow. They, nevertheless, taught the populace that hill farming was of some benefit. So, oral tradition has it that these distinct families of people taught the rest of the majority to cultivate hillsides. In other words, a local innovation which served to solve land problem was turned to be a serious cause of de-vegetation, soil erosion and land degradation. Of course, it is difficult to expect hillside farming to have started overnight. As in all changes, time is of essence here, too. The case shows the impact of idiosyncrasies on collective thoughts and practices.

6.7 Old Theories of Land Shortage and the New Mindset

In this section, local understandings and attitudes towards land shortage and its ongoing shift are explored along with the causes that have precipitated the shift. Among others, this shift could be judged against the images of ample land and small numbers of human and livestock populations. The scientific definition of land shortage is far from being direct. Some conception of the problem has it that the resource endowment and prosperity of the child of an Ethiopian farmer is defined *a priori* to his/her birth, without account of the future potential of the person to manipulate or exploit livelihood opportunities other than tilling the land. This explanation is particularly espoused by those who focus on population pressure as a major cause of resource degradation and underdevelopment in the country (governments, NGOs). These are comparable to the extremists what Sisay has called the ‘hawks’ in the review made in Chapter One (1987). This same conception used to be espoused by local residents of the past who passed away before experiencing the problem of land shortage. Their descendents, however, who faced the same problem

for decades and revised their conception of land, are drifting away from this tradition.

Writing of agriculture in Ethiopia back in the early 1970s, Gene Ellis noted, "Lack of land and low productivity are major constraints in the traditional sector, while the lack of capital and skilled personnel are major constraints preventing the absorption of more labor into the commercial sector" (1973, p. 385). Traditional highland peasant agriculture and commercial lowland agriculture, two divisions of the agricultural sector according to Ellis, could be taken to categorize Ethiopian agriculture today after more than four decades. The same discourses of lack of land and productivity decline mentioned for the traditional agricultural sector have continued largely to the present in spite of improvements that have taken place through land resettlement projects and the injection of some level of capital to improve smallholder agriculture and the introduction of green revolution inputs such as improved seeds, fertilizers, pesticides and SWC techniques.

Local perception of land shortage, though divergent, is quite illuminating. In the first place, to the majority of these people, land is a fixed, given resource that its shortage, and by implication, its abundance, are functions of the size of human population living on a land, and the demand people put on that land. For them, conversions of forest and pasturelands into crop lands as well as the cultivation of marginal lands are among the major defining characteristics of land shortage. While subscribing to these defining characteristics and some others, there are some farmers who argue that land could be made to shrink, and by implication, to expand, affecting the phenomenon that is known as land shortage. In so doing, these people somehow negate the idea that the size of a land is a constant factor, remaining as is since "God has created the earth" or "since God has baked the earth like a pancake". Rather, proponents of this idea argue that soil erosion could make land to sink and shrink, as evidenced when once small rock outcrops, especially in cultivated fields, grow into big

rocks or boulders after years of cultivation. Their main point is that when a land is thus eroded its body will develop sinks, small puddles, raptures and other down letting features evidenced in every village in that mountainous environment. These features affect, again according to them, the shape of the land, reducing the part that could be dealt with plow or that could be cultivated generally. Men generally complain that boulders further eat away productive land, exacerbating the problem of land shortage in addition to the negative effects of their shades. Women, on the other hand, tend to be in favor of them, especially those around the homestead, as they are used as baking grounds in the preparation of dung cakes for burning.

Human and livestock population numbers increased gradually and with this, incipient land shortage, de-vegetation and soil fertility reduction. Up to the time there was an upsurge of population, most probably around 1970s in recent history, the problem of land shortage was not serious, according to local historians. As we already saw, today, the people of the long past are remembered largely as “unwise” who did not utilize their land properly and who were not well-fed and dressed properly, either. Those poor souls, it was said, were worried just for the here and now.

In popular, official and academic models, the ratio of head counts of a given number of people to the land occupied, as the base of their resource, is at the center of the concept of scarce or sufficient land. In such a conception, only the amount of land that can be exploited by available technology and actual spatial distribution of a population are brought to the limelight of the demographic discourse. Amidst this problematization, a new version of conceptualizing the problem of land shortage has been emerging among the communities in which I did my research. Local knowledge has it that land scarcity has been exacerbated over the years as the numbers of human and livestock populations have increased in relation to an existing area of land, as also stated in the national population policy (NPPE, p. 1993). Social

institutions which favored large family size and livestock holding which are still important factors (though in a decreasing trend) have taken advantage of the introduction of modern medication over the years. In one of the men's group discussions, I have documented the following:

> In the past there were many infertile individuals. And those fertile individuals were having fewer children than what we have today. There were three siblings in the family of my father, including my father's father. Two of them died. My father survived and had four children, including me. I have four children. One of my children has six children now. I was the only child in the family. My father was also the only [surviving] child to the family. They wanted to have more children but they were unable.[113]

Another member of the group said, "I used to be the only son to my father; now I have seven children. In my case, we divided the land that was in my father's hand among the eight of us".[114] In a different context, an old man compared the number of children a family gets with the number of axes that add up in the family, all set to cut trees and hack the branches. Such descriptions of population increase and the division and re-division of the same land are ubiquitous cultural texts in Gäddärro. They are well in line with the dominant official and scholarly perspectives discussed in Chapter One, also those acknowledged in the national population policy.

The high morbidity and mortality rates in traditional societies before the advent of modern medication and treatment of infectious diseases are slightly implied in the above quotations. According to local historians, the high rates of sexually transmitted diseases, exacerbated by the custom that encouraged promiscuity, including premarital sex, are remembered as the factors for the high rate of past infertility, both among men and women. Population increase which was a positive result of modern medication and some other factors caused a gradual shortage of land in the first half of the 20th century which was brought to the attention of smallholders before sensitization from external agencies, particularly the state. This is one of the epitomes that TEK could go

[113] Interview transcript
[114] Interview transcript

ahead of WSK in sensing environmental risks and problems. In local discourse of land, however, the 1975 is remembered as a watershed in terms of land scarcity and fragmentation. Even though this policy resulted in what could be called structural change in land law of the country and rural socioeconomy, enabling peasants and the landless to have a possessory right over the lands they sharecropped with the feudal lords, the subsequent decades are remembered as those of land division and further fragmentation because of population pressure.

Among the communities I studied, since the 1976 E.C. land re-distribution, there have been fewer opportunities for newly born members other than family allotment from the same land. Today, the land holding size per household in the district of Wärräbabbo is said to be 0.45 ha. As mentioned in the quotations above, a stretch of land that used to be cultivated by a household prior to the 1975 land reform proclamation has been divided and re-divided among several families. In one case in Šola Gända, I was told a land that used to be cultivated by a single farming household before 1975 was redistributed among 24 households. All the same, this does not mean that the new laws were not positively received. They have eased the problem of land shortage and feudal exploitation for the rural masses of the country. Hence, it is largely understood as a profound political response to land shortage.

The cultural text, *"märét yälélläw säw yäsäw gïzu näw": "the person who does not have a land is a slave to others"* has been a representation of the socioeconomic necessity of land and its associated resources. Such a cultural text is expected to be suggestive of the period in which owning some land was an essential requirement of survival or descent living. Even though it is difficult to establish the time this notion started to change, the current value for land is undergoing a shift from the older theory. In men's group discussion on land shortage in Mïsïräta, a farmer in a group of eight remarked, "I say land is short and not short. Today, the same land that served a household is

supporting six or seven households. We cannot further stretch the land physically. That is why we are now demolishing *dïb* [bunds] in the hunt for fertile soils".[115] Such a conception is similar to that expressed by many other informants in the field. It was openly stated by some informants that there was no need of worrying about land shortage since "God has baked the earth like a pancake", once and for all.

Such expressions should not however be taken to mean that land shortage is not a problem among these communities. They underline that different local and extra-local strategies are employed to lessen its negative effects. It is quite simple to decipher this from most of the interview data I gathered. Abärraš, a woman in a group discussion in Awraççа, remarked, *"In order not that we say the land is enough, we have shortage of it; in order not that we say it is short, the government has allotted to us what is available. We are working all crops on the land that we have. We grow maize, we grow wheat; we grow everything but ašabo [salt]"*.[116] An extreme case of the conceptual revision in this regard might be the one I heard from a man in Mïsïräta. He remarked that what was critically needed for a person was "just seat for the bottoms". These cultural texts could be taken as cultural resources that are emerging relative to the empirical experiences of land. It is a move away from the old customary understanding to a new sense of direct perception. However, as Tim Ingold would have liked us to believe, this perceptual change is not resulting only from direct engagement with the environment, in this case the land (Ingold, 2000). Multiple factors are accountable to this ongoing shift in the collective understanding of land shortage and its adaptive strategies. Causes repeatedly evoked in nearly all of the interviews and discussions I had with farmers in this regard were agricultural technology, contraceptive technology, off-farm income opportunities, overseas migration, as well as international relief and development aid as stipulated in my theoretical review in Chapter Three.

[115] Field notes
[116] Field notes

Ecologically, there is a growing local awareness that both shortage and excess of rain affect the productivity of crop and pastureland. In specific terms, for instance, all the geomorphologic variations already discussed in this chapter affect how scarce or enough or excess a rain is relative to a specific plot of land and how that land is economically perceived. Almaz, who is about 50 years old and one of the women in the group discussions I had in Mïsïräta, remarked that, since she was borne, there had never been times in which there was no land shortage problem. She added the things that were necessary for survival were out there attached to the land and their former living was one that resembled a chicken scratching ground to secure a pick. Today, she continued, those who have been able to tackle the problem of land shortage successfully were those who persevered and ventured upon growing *çat,* fruits and did petty trading.[117] These are just parts of the indicators of the concept already mentioned -"seat for the bottoms". In this regard, it might be interesting to note villagers' remarks such as "A unit of land could be small or large", in addition to those already quoted in this section. For these rural communities, today, land shortage or abundance is not just a spatial concept. It has also become a social concept that depends on the factors already mentioned and some others like the skill and decision-making ability of farmers, idiosyncratic TEK and entrepreneurship. The other remarkable analytic point is the linkage that these people maintain between the state, the creator God and humans, or themselves in this case. There is strong community expectation from government and the international community through it and in the face of this, land shortage is never experienced as tough as it is or could be.

Along with this change, the role of land as a measure of wealth or factor of economic differentiation has been decreasing over the years. There were farmers who said even though it was customary to talk about land-rich and land-poor people; it is now believed the person who has some land is never

[117] Field notes

poor. For them, there is a “critical mass of landholding”, already captured as “seat for the bottoms”. Hence, whereas it is still highly desired by every person to hold as much land as possible, it is not true that lack of this would necessarily plunge the person and his/her family into hunger or poverty. Therefore, it was argued, the most important thing was to be able to secure this land, primarily to build one’s home. Once this is secured, the person could rely on local networks to sharecrop-in others’ land even though this opportunity is decreasing from the same problem of land shortage. He/she could also do some off farm job like petty trading as well as relief and development related works. As such, it is said, not only an entrepreneur could become self-sufficient but also an economically successful person. In the literature and public discourse on land, such measures of land are perhaps partly comparable to what Dessalegn (1996) called “starvation plots”. The traditional understanding that the person that does not have land is the servant of others carries lesser weight nowadays.

The application of modern agricultural innovations, credit inputs and farm management advices have their own positive implications in considering land as a resource amenable to investment which is also a significant breakaway with the traditional sentiment. Behavior change communications and policy interventions in the areas of adopting and promoting soil and water conservation, keeping economic number of livestock, applying short-maturing and high-yielding crop varieties have already cast the seeds of change in the conceptualization of land as a technologically and socially constructed resource. Internal movement in search of income opportunities and overseas migration adopted as survival coping strategies mostly by young women and men have been important responses related to livelihood strategies. Remitted cash and household commodities, most importantly by young women who leave thus, have been nascent channels of contact between these rural communities and the rest of the world. Therefore, apart from easing the pressure on land, out migration has started to serve as a new source of cash

flow to these rural communities. Food and cash based consignments that have been reaching since the notorious famine of the 1973-4, all the way to the present, have unexpectedly been a cause for revision not only of the traditional understanding of land and locality but also of their entire ecosystem. All these findings are testimonials that ecological factors are interrelated and demand composite theorization to understand their interplay better. (These and other factors or coping strategies are discussed in detail in Chapter Twelve).

The foregoing should not paint a homogeneous picture of these communities, however. Some farmers made such remarks as *"andit kuta yaw and nat"* and *"yägänïfo wïha yaw lägänïfo näw",* to express their contention that there was little they could do with the problem of land shortage. Some elderly men underline that unless the government coerces people to leave the area into where there is land in a resettlement program, the problem of land shortage in their society would not be solved. It was argued that the government should do this as a matter of necessity, especially with the physically able ones, the young. While this was largely the perception of older people who exonerated themselves on account of infirmity, I have also found some young men expressing interest to be relocated across regions (e.g. Wellega) and especially the neighboring region of Afar but the current policy does not allow inter-regional land settlement. Over the years, a number of households from the district have been voluntarily relocated as part of the regional government's food security strategy into western parts of the Amhara region namely Mättämma and K'uara. While seasonal labor migrations are made by men from Gäddärro and the rest of Wello, to Mättämma, these settlement areas are unfavorably viewed as a permanent residence because of negative ecological factors such as malaria. Moreover, the conception of land as a sole resource for the sustenance of rural life has somehow decreased with the growing problem of population increase, out migration and some off-farm and non-

farm income opportunities. Despite this, as already mentioned, most of the older generations consider themselves permanently attached to their land.

While lack of improved technology, inappropriate development policies, poor and ineffective agricultural extension, war and political turmoil have been acknowledged as exacerbating factors, the national population policy holds population increase as the major culprit in the disturbed human-natural resource nexus in the country. As stipulated in the policy, "the harmonization of the rate of population growth and the capacity of the country for the development and rational utilization of natural resources to the end that the level of welfare of the population is maximized over time" (NPPE, 1993, pp. 27-29) which has been the major goal of the policy, is to be achieved, among others, by technological, economic, political and ecological measures. These and other additional responsibilities are well-acknowledged in the first-ever National Population Policy of Ethiopia.

6.8 Land, Life and the Afterlife: An organic human-land relation?

In their Creation myth, Gäddäroans believe that God created human beings from soil[118], an important component of land, and local residents conceive an organic relationship between land and humans in general. The statement *"Our body is made of soil; and upon death we enter the same soil",* is a ubiquitous expression of this relationship. The oneness of land and humans is structured along the *"on the earth"* and *"in the earth"* notions. According to the *"on the earth"* notion, individuals as living persons act on the land in order to fulfill their material and spiritual necessities. On the other hand, based on the *"in the earth"* concept, after death, they are entered and would affect the land through their souls or spirits that remain behind. Their 'spiritual food' in the afterlife (during *Akira*), among others, derives from a person's material and spiritual treatment of the land as a living person while on *Addunia.*[119] This organic

[119] This refers to worldly or material life

human-land relation is thought to have begun with *Adäm* (Adam), also the first farmer on earth, according to these people's belief. In this connection, one of my key informants from Awraççа, Ayyälä Täkka, in a group discussion, inquired, *"Where have we gone? Once we are borne, we live on the land and once we are dead, we shall be put inside it. Where else have we gone?"*[120]

On land these people grow their crops. On the same thing trees and the rest of the plants grow for them. The land furnishes the space upon which not only their homes are built but also upon which they literally "sit and walk" as this old man was emphasizing. Like the mythic ox that carries earth on its horns, believed by these communities, the land carries humans who walk, sit and work on it. When individuals die, they return not to, but into the land. Thus, the land is conceived as home to humans both during *Addunia* and *Akira*, life and the afterlife, respectively. According to local understanding, this organic relationship is cultivated as individuals in this world relate with particular spaces of land as farmers. When a person leaves this space at death, owing to the good relationship cultivated with the land, the person's soul or spirit is believed to remain attached to it. By religious provisions, the new owners are expected to acknowledge the relations of the dead person to the spaces s/he owned and interacted with physically and spiritually as a living person. Accordingly, survivors working these spaces need to fend for the spiritual food of the dead person lest the fertility of the land would decrease or harvest would be damaged by any conceivable cause. Thus, nearly everybody made an offering *(sädäk'a)* to the souls of their dead parents in order to appease them with a spiritual food they needed to sustain themselves. It is believed that dead persons' souls who miss this food envy others who get it with whom they had to share. As a result, the ritual is also accompanied by some religious chants. Hosts are usually expected to say something like *"fäk'ağ lalläw fäk'ağ lälélläw yïh sädäk'a yïdïräs"* to mean *"may this offering reach to those who*

[120] Field notes

have survivors and who have not to make such an offering in their names". Fulfilling this spiritual requirement is said to be essential to protect and render the crops and the livestock healthy and productive. Once, I was with a farmer who had his maize crops mutilated by hyenas playing in it. Inspecting his field the next morning, he was quite angered at these beasts. In the face of this empirical reason which he had actually experienced, he was questioning if there was something wrong in the way he serviced the last *sädäk'a* he had for his father. In the course of my fieldwork, I had observed this person offering *sädäk'a* not only for his father but also for his mother who died after my arrival in the field.

As such, when a living person interacts with a given plot of land formerly owned and cultivated by a dead person, the belief is that the new person interacts not only with the physical land but also with the spirit of the former owner. By virtue of this, in the traditional paradigm, farmers are accountable to the land they cultivated both physically and spiritually. In other words, this means that they are accountable to their families, to government, to their neighbors working adjacent and other tracts of fields in the area, to the ecology itself as well as to the spirits of their dead ancestors, or dead persons in general. In a manner comparable to what Mesfin (1986) said of the landlord with respect to connecting peasants with God and government, for these communities land is the intermediary between the farmer and his/her productive and reproductive responsibilities; between him/her as a citizen and the government which rules the country; between his/her age old knowledge and WSK; between his/her wish and those of their dead ancestors and of course, finally, between his/her life and the afterlife as well. For the Ethiopian farmer who toils under his/her, God's, government's and the international community's environment, land has been so complex a matter to which life and the afterlife are enmeshed save the younger generations who are breaking away from this tradition. Therefore, these communities could still be understood to depend on religion in addition to secular reasoning in their

explanation of environmental misfortunes, agricultural success as well as failure. Many other problems, constraints and opportunities are also understood in light of this religious understanding. Such social and religious factors are not appreciated in the official and most of the scholarly knowledge that affect government decision-making as a stakeholder in the management of agricultural lands. Accordingly, this has been one of the difficulties affecting not only agricultural but also other socioeconomic development in rural Ethiopia over the years. The common denominator between farmers on the one hand and experts, governments and the NGO community, on the other, is not yet wide enough to allow similar perception of challenges, constraints and opportunities of development and underdevelopment.

6.9 Land the *Aténa* and Its Spiritual Taxes

There is a saying, *"läsäw tabäddärä lämärét yabäddärä"*, which means, *"He who has lent to the land is better than he who has lent to someone"*. This saying could be taken to epitomize how land has been at the center of the economic tradition of these people. Today, the efficacy of this lore carries weight mostly for the older generations, who believe that their life is attached with the land, once and for all. The young give less value to it because of out migration and less respect for rural life. Crops are grown on the land; the tools that are used to do so are largely made of the trees that grow on the same land. The livestock are pastured and watered basically on the same resource. The efficacy of this saying might have been compromised by growing land degradation. Nonetheless, the saying *"märét alabawan attak'uarïtïm",*, to mean, *"the earth never ceased its yield to humanity"*, suggests that the lore has not lost its meaning. Its efficacy is carried into the future even after repeated crop and livestock failures in local history. As shall be discussed in Chapter Twelve, international relief aid and economic cooperation have their impacts on the revision and sustenance of this cultural understanding of land.

As a result of this sustained utility, land or earth is often perceived as *aténa* or *ma'ïd* where these people get their food from. *Aténa* or *ma'ïd* literally means a plate or food served on such a plate. *Ma'ïd* which is always a main dish is religiously and traditionally respected and imbued with symbolic interpretations. It is a source of food, though ready-made, and its metaphoric extension bestows land as a major source of livelihood without which these people could hardly survive. Everyone has to have some access to food in order to survive such that life is not also conceivable without some form of access or entitlement to land. As food is normally served continuously to human beings, the land is thought in the same manner enabling them to produce their food continuously. It is believed that people sharing a *ma'ïd* are like those who share a commune. Similarly, people who enjoy collective rights over some form of land are expected to have a similar kind of community. This symbolic expression is more complex than simply indirect. Practically, there are several forms of communing land in Gäddärro. Lineages share some land that has been held by their ancestors. The village corporation shares a socially and physically defined territory which its members occupy and protect as a village. Patrilocal residence defines the lineage land and an individual's socio-spatial center in his/her global cosmology of places. Villagers and lineage members share sacred groves and spaces such as burial sites in their religious activities. Bumper harvests, droughts, food insecurities and famines generally affect these people materially and spiritually. Thus, notwithstanding individual differences, there is a high tendency of having a shared image of the past, the present and the future of their land save the younger generations.

The traditional *aténa* or *ma'ïd* is made of grass. It is one of the cultural materials bearing their identity. In a similar manner, the home village is an important aspect of identity, over and above the simple concept of territorial identity. The *aténa* is further a symbol of tradition as no foreign material is employed in its workmanship, both as raw material and a tool. Hence, by

employing this metaphor to the earth, all of these meanings are extended into the land. What is more, the *aténa* or *ma'ïd* can be seen as a symbol of indigenousness, as against foreign elements of thought and practice that are not easily absorbed into these traditional communities. Therefore, some of my informants sharply contrasted the *aténa* or *ma'ïd* with the western-made tin-plates and tin-trays introduced some three decades ago. Some adults remembered with a sense of fun and incredulity the difficulty of using these newer plates in the beginning.

As a multivalent symbol (Turner, 1985) the *aténa* or *ma'ïd* further represents satisfaction, blessing or *bäräka* and abundance as against the western-made iron-plates which are said to lack these blessed qualities. Of course, according to elders, such utensils are regretted to have eroded these spiritual qualities, also contributing to their food insecure status. By further extension, we get something of analytic importance. The intrinsic and extrinsic properties of the *aténa* or *ma'ïd* have been affected by the introduction of a western element of material culture (represented by these iron-plates) more or less in the same way the land has been affected by the western-made agricultural extension services. For instance, chemical fertilizers (DAP and urea) are said to be removing the natural fertility of the land once the land is adapted to these inputs. Modern crops and animal varieties introduced, in spite of their immediate benefits, yet affect the pool of indigenous genetic resources (strains and landraces) well-adapted to the local ecological conditions. This is local knowledge held by a small number of traditional experts. Similarly, the plastic sacks, locally known as *keša,* used to store grain crops instead of the traditional home-made silos called *gotära* or pit granaries, is mentioned as a robber of the *bäräka* of the crops and hence of the land. This symbolized hunger and food insecurity. The *aténa* or *ma'ïd* symbolism of land is related with another meaning, stressing the economic significances of land. Quite often, it is said, *"märét ïrïzïk'aččïn nat",* to mean, "*Land is our fortune or wealth"*. Formerly, this expressed the complete dependence of the people on

their land for their living. Today, amidst growing land shortage as already mentioned in section 6.8, it is ironical to hear these communities say "what is required is just seat for the bottoms". *Ïrzïk'* is a source of livelihood.

It is also interesting to note that allusion to the Quran, regarding one of the five pillars of Islam, is made in relation to land or the earth. In this allusion, while earth is willing to offer its blessing to humans, nonetheless, it is not like the indigenous game animals of the natives of the Americas which simply give off. In this case, Gäddäroans state, the earth needs something in exchange from humans, which is her[121] *Zäkha,* what I recaptured as spiritual tax in the title to this section. Accordingly, in local tradition, the earth is believed to be saying: *"Measure and proclaim in open what I had delivered. Pay my Zäkha for that and thank me for what I have offered"*. Thus, it is believed that when these reciprocal requirements are fulfilled, the earth will get appeased. Otherwise, she will get disappointed to hide her "blessing or secrecy". The image of humanity invoked by one of the 'technological optimists', Chorley, as "an increasingly numerous, increasingly powerful and progressive, if capricious, master" and that of nature as "a large, increasingly vulnerable and spitefully conservative serf" (Chorley, 1973: 157, as cited in Blaikie and Brookfield, 1987, p. xix) has got only some kernel of truth in this regard.

According to the new local theory, these days, unlike in the past, people have to conserve nature, rather than nature conserving people. In here, the same ecological challenge western societies have come to understand scientifically is understood religiously. In traditional societies land is treated as an empirico-religious object. In the west, it is treated as an empirico-scientific object. In traditional societies, people had to look backwards to explain problems with their lands and the resources that grow on them. Similarly, they have to look backwards to seek a solution. In the western perspective, science

[121] The earth is not gender neuter as it is in English. In all the cultures I know of in Ethiopia the earth is given a feminine gender-she. All the same, when it comes to a specific unit of land, such as farmland or grazing land, there is a shift into the masculine gender-he. Perhaps, this could also be an interesting subject of symbolic interpretation.

does look into the past to explain current problems with the land. All the same, solutions are largely more practical and forward-looking. The epistemological difference between the two types of knowledge, that is TEK and WSK, has been one of the policy challenges for land resource rehabilitation and conservation in Ethiopia over the last half century. While it might continue to be so for several years to come, unless the knowledge gap is removed, there are some positive changes that have already been started among the communities of Gäddärro.

The conception of land as *aténa*, *maid* or *mäsob* from which Gäddäroans got their sustenance always is a cultural construction of the environment comparable to other communities, who, for instance, consider the forest as a parent. In this regard, much has been written on the question of intimate relation of humans to their environment, especially on hunter gatherer communities (e.g. Turnbull, 1965, Endicott, 1979, Bird-David. 1990, as cited in Ingold, 2000). Among the Mbuti Pygmies of the Ituri Forest, Turnbull observed that they treat the forest as "Father" or "Mother". Kirk Endecott documented a sense of interdependence between the Batek Negritos of Malaysia and their forest environment. Nurit Bird-David's accounts of the Tamil Nadu, South India, have the forest as mother or father, with which the people enter into an organic kind of relationship and from which they get their food "not in return for appropriate conduct but, unconditionally" (Bird-David, 1990, as cited in Ingold 2000, p. 43). In relation to neighbouring cultivators, Bird-David has shown the contrast in which the environment is seen as ancestors and not parents. In the context of these populations, she reported that the ancestors yield the environment to give of not unconditionally but 'in return for favours rendered' (Bird-David, 1990, as cited in Ingold, 2000, p. 43) as in the Gäddärro case. Bird-David has suggested this as a fundamental difference between hunter-gatherers and cultivators in relation to their environment (Bird-David, 1990, as cited in Ingold 2004, p. 43). In view of the Gäddärro case as well, even though the environment is not explicitly

conceived as a parent, strong link is constructed between land and the ancestors. These ancestors are also considered as the source of fertility for the land and the ritual offerings are made to their souls in order to be appeased and let the land give its bounty in return. The social construction of land as ancestors did not cause them to think or practice materially and ecologically rewarding soil conditioning or protective activities in relation to the general environment. As we have already seen in this chapter such an idea is just on the start, as such activities as soil and water conservation are now beginning to be regarded as part of the traditional *Zäkha* to land.

6.10 Women and Land Change Hands

An analytical inquiry into local cultural understanding reveals that an agricultural land could be a space owned by a farmer at a time; a space owned by a farmer at different times; a space owned by two farmers at a time; and a space owned by different farmers at different times. Further to this, it could be a space owned by extended families; a space owned by compound families and a space owned by a form of cooperatives. From another perspective, they also regard an agricultural land as a property belonging to different people in different social classes in the ups and downs of local and national political trajectories. In specific terms, the major intermediaries in this change of ownership or use rights are the following. These are customary or illegal sale; exchange of land by land; mortgaging; different sharecropping arrangements; inheritance; gift giving; state-level policy shifts and local reallocations. The local Amharic saying *"Setïnna märét täläwawaç näw": "women and land change hands",* signifies these continual shifts of land ownership. From these practices as well, agricultural land is represented as a socially constructed space affecting farmers' perception of abundant and scarce land.

We also see that the power relation between men and women is extended into humans and land. The metaphor "women and land are the same"; or the simile, "land is like women" are common statements in local discourses

around land. “Women and land change hands”; “renewed are women and land” which we already saw, add up to such expressions. It is said that both women and land, however worn out and old, are new to their new owners/husbands. A man from Mïsïräta remarked, “A woman is always new to her next husband; a land is always new to its next owner”. In relation to men, local views are somehow divergent. There are people who argue that men could never have enough of a land and would prefer to have their wives taken than their lands. The second group contended that a man should die for his wife as he does for his land. It is more than evident that there is a strong value of patriarchy behind such normative statements and their behavioral reflections in daily life and land resource management.

Historically, it is probable that these linguistic features appeared well after land degradation was perceived and people responded to counteract it. With the growing problem of land degradation, land shortage and the need to deal with these problems, there has also been improvement in the amount of energy and resource put into rehabilitating, conserving and enhancing the land. Of course, efforts exerted have never been commensurate to the level desired. Coupled with government intervention in the provision of technologies, inputs and extension advice, the perception that land is a resource in need of investment has come growing and replacing the old mentality which took it as a resource for granted. As a result, among others, agricultural land today is considered as a socially or technologically constructed space- an attitude quite useful in the face of the growing need to resolve the problems of land shortage and soil infertility.

6.11 Homeland, Locality and Identity

With the reduction in land as the sole resource of sustenance for growing number of rural population over the years, we find that the institutions behind land, including the patriarchal values, have been shifting to accommodate the ecological changes and the social factors surrounding them. Increase in rural

population, consequential shortage of land and lack of non-farm opportunities at local level have rendered land, especially for the youthful generation, a less important resource to depend on. Among the adaptations required was to free the male child that had been locked to the land, the paternal homeland, even though this has occurred gradually. Patriarchal attachment to the land has been up till now strongly expressed in patrilocal residence even though descent is ambilinial among the Amhara. This ensured the succession of land ownership along both lines of mothers and fathers, ensuring the economic sustenance or survival of the group. The economic centrality of land had also been made an aspect of the political security of the group or lineage and its identity against such other groups, especially in the surrounding territories. Actually, it also played such a significant role at intra-community level, which has always been a social arena for divisions within the broader framework of alliance which sustained it as unified whole. As such, for the male child, remaining on the paternal home village was not only an economic requirement but also one of political security articulated in kinship and economic terms.

The traditional dissociation of women from the land, especially from the paternal land has been strongly supported by the following institutions. The saying *"yäwänd lïğ agäru yabbatu agär näw": "the country of the male child is his father's homeland"*, till very recently, had generally been associated with the practice of keeping the male child at his father's village. The female counterpart of the saying, though with a similar intention and effect as the former, goes as *"yäsét lïğ agärua ïgïrua": "the country of the female child is wherever her feet took her".* Therefore, the cultural association of men with land and the disassociation of women from the same property had continued for long. At the ritual level, by virtue of the burial of the baby's umbilical cord in his parent's homestead, the paternal homeland symbolizes a never-ceasing kinship between the child and the land, imposing a corresponding socially and emotionally important behavioral disposition. Deviation from this is quite rare, believed to be taking place in cases the umbilical cord was given to and

eaten by eagles, as some parents supposedly did or do this to free the male child from the lock of the paternal homeland when he grows up. At the same level of symbolization, the land is considered as the incense of the farmer, when the child comes of age and assumes economic responsibility. My assistant, Yïmam, remarked, *"Afär yägäbäréw muhäkkäl näw",* to mean, "Soil is medicine of the farmer". It is his *muhäkkäl*, a ritual scapegoat killed or kept to hill a sick person or ward off misfortunes from an individual. In the same manner, the odor from the soil that comes when the land is broken is craved for by the true farmer. It is his medicine and a true farmer cannot do very well without it. Thus, getting soiled with earth is valorized and respected rather than shunned away. Today, there is a big change in this respect. Toiling on the land is considered as a less viable, of course, a precarious job which many parents do not wish their children to engage in.

The very home or village from which a person is originated is also the hub of the person's identity. In the context of traditional Amhara, living far from this locality detracts from the social importance, respect and freedom of the person. In Gäddärro, an attempt to find out the root or home village of a person is one of the most disappointing misbehaving a stranger might make. Such an issue could only be whispered, if at all it is made an issue. It is taboo. This is perceived as denying a person's citizenship right. Sometimes, in the face of this, a person who moved into and married in his mother's village could still be called after his mother's name instead of his father's. That who has moved into a place of his wife's family could be called after his wife's parents' name.[122] No matter how long he lived and is integrated with the host community, such a person is ultimately regarded as a *mät't'e*, new comer. Therefore, the ancestral home village or the home village where a man's umbilical cord is buried is held with a great sense of attachment as an identity.

[122] In Gäddärro, where nearly every adult man has a nickname, it is no wonder for such a person to be called as such. From the entire villages I studied, I was told only one man did not have nickname for being a little bit hot tempered. Use of pet names is not uncommon for women and young people.

The institution that used to encourage the female child to leave her father's village even though she had the right to inherit land and property has also been a strong norm promoting exogamous marriage. In the typical traditional sense, the male child is regarded as the powerhouse or the defense of the family in all aspects of life, especially after the death of the father. The following couplet laments the lack of a male child in this regard.

"*Dägğafun arräsut zäk'ïzïk'äw ïnïdäboy"*	*"They plowed his doorway, down like a waterway"*
"Abbatïyäw bimot lïğïyyäw yälläm wäy?"	*"Weren't the son around, though the father was gone away?"*

The male child is seen as the guardian of his father's homestead and land, and by extension, that of the larger family. Land, as the main source of sustenance for current and partly the future generations of a family, could thus be secured or risked in the traditional mentality. A man dying without a male child to takeover this responsibility suffered "a real death" as his land could be usurped by others. This is said to appease one's enemies and sadden one's friends. Hence, it is most hated. Due to this, it is said, "*both for the ill wishers and for the well wishers"* there has to be a male child or next of kin to defend the land and other properties of a family. This saying, which used to tie the male child to his father's locality, has been losing force of recent due to a host of local and extra-local factors such as land shortage and overseas migration. The importance of the male child is further strengthened in the following couplet whatever small he was when such an injury was done to his family.

"Märét ïyyïy alä aläk'k'äsä ïnïdäsäw"	*"The land kept weeping, like a human being"*
"Ğägïna lïğ täwäldo tolo	*"Until there was a son, to fight it*

ïsïk'imälïsäw."	*back again".*

The meaning is direct. It extols the small male child who could fight back the land lost to others when he grew up into adulthood. This shows how conflict over land and the redress of injury could run across generations. The cultural association between males and the land could even be a matter of more intangible understanding. At burial services I had attended eldest sons were called on to ritually start the digging of the pit. If there are no sons, a close male kin of the dead person was called on. This very brief ritual known as *fäläma* is held with high spiritual regard among the older generations. To have someone as a *fällami* on the very last day of one's physical departure from earth that is from the *"on the land"* to the *"in the land"* notion of life, is quite meaningful to the elderly. Hence, one of the most liked blessing: *"May He leave you a fällami behind."* The entire course of the remaining chapters demonstrate that changes in these cultural notions are undergoing as many young men and women, including school graders, high school graduates and the landless move within the country and migrate out in search of living opportunities.

6.12 Conclusion

The focus of this chapter has been on describing and evaluating the traditional cultural understandings of land as an agricultural resource and home to smallholders. The task of deciding which aspect of culture is traditional and which is contemporary is a challenging one. As culture change is gradual rather than abrupt even in the case of planned transformation, that, which is traditional, and contemporary or emergent, could co-exist for a reasonably long transitional period. This difficulty has pervaded this chapter and I had to face the same challenge throughout the rest of the dissertation. Nonetheless, based on oral history and a number of written documents, one can arguably

establish a watershed for what has been traditional or contemporary or of recent in the natural resource conception and use practices of Ethiopian farmers. Thus, the demographic transition the country has entered around the second half of the 20th century, resulting in a population boom; the growing climatic change in low, intermittent, mistimed and lack of rains or droughts as well as the introduction of modern agricultural inputs and advices and the introduction of relief aid to save the lives of famished people in many parts of Ethiopia could be taken as the different aspects of this watershed dividing the traditional and the new conceptions of natural resource management in the agricultural history of the country. Therefore, the discussions and analyses in this chapter could be seen in light of this understanding.

It has been revealed that the cultural understandings of the past were largely not so conscious of land as a scarce resource because land was in relative abundance for at least a century after the first ancestors of these people were resettled in Gäddärro from different parts of the country. The demands placed on land were limited and gave enough time for land resources to rejuvenate themselves along with the limited techniques employed to recuperate the fertility of the land such as long-term fallowing. Practically, it could be said that their conception, coupled with a number of other factors, made them take more from the land than what was given back to it, yet only to realize that this was wrong after a long time. Today, the situation has been a serious challenge to reverse. Therefore, notwithstanding the contention that western scientific knowledge has much to learn from traditional environmental knowledge to reduce the inherent knowledge deficit of humanity in relation to nature, the case also supports those who doubt the efficacy of traditional knowledge.

We also learn from this case that because of this inherent epistemological deficiency, the task of evaluating the pros and cons of cultural understandings and practices of land in relation to sustainable land resource management is difficult though not impossible. Within their own ecological, economic and

epistemological framework, the cultural understandings that held land as ample and inexhaustible resource were feasible. Nonetheless, if we think in the language of sustainable resource use, it is not enough that humans occupying land at a given historical period make use of its resources and pass away without showing concern for the generations to come in the future. In this sense, the traditional cultural understandings analyzed in this chapter have had more pros than cons to the current potential of the land and its economic importance. “Over-cultivation”, “over-grazing” and “land degradation” that are among the catch phrases in agricultural and environmental degradation discourse of Ethiopia testify that the traditional land conceptions had been largely problematic. Even though as some writers (e.g. Mesfin, 1986; Kebede and Hurni, 1992) contend farmers have adequate reasons to degrade the environment, this chapter and the rest of the dissertation, contradict this position to the extent that farmers are also responsible in many respects. Land degradation should be viewed as a natural processual concept. Humans as a part of nature contribute to this degradation so much so that they could contribute to its rehabilitation. Thus, degradation and rehabilitation, we could say, are inherent aspects of the natural condition, humans being viewed as part of this condition. Therefore, the mere existence of humans does not degrade the environment irreparably so much so that it does not achieve or guarantee a sustainable use of resources indefinitely.

CHAPTER SEVEN: SMALLHOLDERS AND THEIR SOIL ENVIRONMENT

7.1 Introduction

This chapter explores smallholders' perceptual and cultural understandings of soils and their responses to soil degradation. It generates descriptive knowledge about local conceptions and categorizations of soils, soil productivity, soil degradation and conservation. It also demonstrates how a resource taken for granted at one time is understood as a scarce investible resource, at another. In this process, soils traditionally considered natural have also evolved to be viewed as borrowed soils (soils coming from upstream) and anthrosols (soils made by humans). This perceptual shift and its accompanying behavioral changes were started by a few individuals before they were shared by the majority. The shift is also accompanied by a probable increase in the lexicon of terms used to describe the different types of soils. While parts of this lexicon are shared by the majority, others are not yet. While these and other cultural aspects of the soil environment affect smallholders' attitudes and practices regarding soils (Bird-David, 1990; Milton 1993), the chapter also underlines that smallholders have to depend on their direct perceptual experience with the soil environment (Ingold, 1992, 2000, 2004; Pálsson, 2006) in their agricultural practices.

The analysis of soil erosion and nutrient depletion presents TEK as an important supplement to WSK. This is particularly so in the measurement of soil loss and the accounting of their socioeconomic and ecological impacts. Growing awareness of the soil environment and its degradation has caused smallholders to implement a host of traditional and modern SWC practices over the years, including those introduced by governments. In this chapter, I show how the culture which used to value just the possession of land to the disregard of soil has been changing in favor of soils as a property. In a society where people traditionally used to lose and regain land, the focus had been

just on getting and maintaining land. Today, the focus has shifted towards optimizing the value of soils on a given unit of land. It is also one of the themes of this chapter that TEK and practices are challenged by ecological changes and government policies. The chapter also demonstrates how smallholders' understanding of soils is enmeshed with their religion and micro-ecology.

7.2 Conception, Classification, Productivity and Agronomic Practices

The most difficult challenge I experienced during fieldwork has to do with how villagers perceived and understood their soil environment. It is not difficult to grasp the three major categories of soils, namely fertile, middling and infertile soils. Rather, the ways the different types of soils are understood within each category are confusing. Many concepts are applied locally to categorize soils as agricultural resources. Color, depth, texture, permeability, workability, erodibility, geology and fertility are employed to classify, describe and define soils and their characteristic attributes. Ultimately, fertility, which also combines most of the forgoing concepts, is regarded as the most important factor to evaluate soils in agricultural activities.

TEK in Gäddärro further classifies soils into three broader categories based on their geological formation. The first category is represented by topsoil or crust on which plants grow. This is the fertile part of the earth which is also in line with science. The second is referred to as the mid-level soil. One gets this part when the topsoil is removed as in carving away the soil in preparation for building activities. It is the part that farmers build their homes on. What farmers called the "inner part" of the earth constitutes the third category of soils. This is the part of the soil dead bodies are buried in and believed to be their "eternal home". The saying "We make use of the earth while living and we get buried in it when we die"[123] is a ubiquitous reflection of this thinking.

[123] Interview transcript

Materially, topsoil is the most valued because it is where crops are grown, grasses spring forth and trees thrive in the first place. It is also the management of this part which is one of the components of the 'natural' agricultural resources at which this chapter is aimed. Farmers classify this soil (which could be termed 'agrisol') into different classes based on different attributes. Based on fertility, which is the most important quality required of soils, there are three types of soils in Gäddärro. *Läm afär or läm märét* (fertile soil/land) is the preferred soil for growing crops and raising livestock, except for such crops as lentils and peas. Secondly, *mäkakkälläňa afär* or *mäkakkälläňa märét (*mid-level fertile soil/land), which is clear from its name, is the second preferred soil for agricultural production. Lastly, *sïs afär or märét (çinça märét)* is infertile or the least fertile soil. According to local knowledge, except for such crops as lentils and peas, it is not suitable for other crops unless treated.

The topsoil, which is generally classified as *ašara koffé* or *täfäfïta märét*, is sandy. It is highly permeable and less difficult to work during wet times. According to local knowledge, Mïsïräta is largely made of this soil. The second type is called *yäwïha märét* or *walka,* which is clayey. During heavy rain, this soil will become water logged, damaging crops on it and rendering soil workability very difficult. During normal or even less than normal rain, it is said to be very productive as its residual moisture can last for months without rains. According to farmers, this soil is said to have natural water underneath and will not become dry soon even under prolonged dry weather. In their description, it is possible to note that there is always a middle grounder between the two. Permeability or moisture retention quality is about drought resistance. This quality, farmers said, is dependent on texture, topsoil depth and rock composition of the soil. While this is partly natural, local knowledge has it that human intervention can improve or degenerate this nature of the soil. Accordingly, the soils known as *läm*, *aränza* (soil with many rocks in it), *dingay t'ala* (soil with some rocks in it), and *walka*, are

favored for their moisture retention qualities even though *walka* is the least permeable unless there is much rain due to its fine texture. *Aränza* and *dingay t'ala* are soil bearing pebbles, rocks and stone materials, the former being more so than the latter. Such soils consume too much seeds as some get buried in the rear of the rocks and get rotten rather than germinate. Their high moisture retention and productivity still make them preferred for cropping. *Çinça* soil is the least in terms of moisture retention due to its course texture. It is also infertile (shallow topsoil) and also known as *wägäb märét* (wasteland). Notwithstanding this, soil which has lost its fertility through over-cultivation, but looks fertile, is also called by the same name, *çinça.* Each category of soil could be further divided into first, second and third grades based on level of productivity. For instance, *walka,* which is generally categorized as middling can have first, second and third rates of its kind in terms of fertility. (See Appendix 6 for major local terms used to describe soils).

Local variability of soils is pervasive. In a small plot of 20 by 20 meters it is possible to observe crops growing at different stages, some thriving well and others stunted. The depth of the topsoil is also quite variable as this can simply be observed when the land is tilled. I had observed many such fields in all the villages I covered in this research and during some of the plowing exercises I did. The different landforms discussed in the preceding chapter bear their significant impacts on the soil status of a plot. The difference in soil type and quality is therefore significant even within a village leave alone agro-ecological divisions on which policies and programs are based. This micro-ecological variation is well captured by local knowledge but the details of this knowledge can be so complex based on the direct perceptual engagement of individual farmers. (The estimated percentage distribution of soils in the ethnographic research and neighboring villages is given in Appendix 7).

The different characteristics of each of the major soil types determine their value as an agricultural resource. Notwithstanding the human factor involved in optimizing or minimizing the value of soils, farmers claim that their natural attributes in themselves bear significant impact on production and productivity. This knowledge, which is also in line with science, is seen both at individual plot, individual household plots and village levels because of the afore-mentioned micro-ecological variations. Those villages like Awraççа which have shallow soils (farmers call them *afärä k'ällal,* literally light soils), for instance, are considered generally to be less productive. This happens also because of their reduced drought and pest resisting capacities compared to such villages as Šola Gända where the topsoil is deeper (locally known as *afärä käbbad,* literally heavy soils). This natural ecological variation is considered by farmers as one of the most important local factors affecting the application of manure and chemical fertilizers. Also depending on this factor are a number of other agricultural decisions running from planting through harvesting. The access a farming household enjoys to a certain soil type thus affects its ability to produce enough food to survive and perhaps set aside some contingency stock. This impact is more pronounced in drought and moisture stressed seasons. Villagers with shallow top soils would lose more than those with deeper top soils. As it is already suggested, this difference has got both intra and inter-village characteristics.

In relation to these micro-ecological differences, the same concept used to judge the value of crops is also applied to judge the value of soils. It is remarked that "*ïhïlïna ïhïl and addälläm"*. This means the value of a given amount of grain crops, say, a tin of wheat grains and that of other wheat grains measured by the same unit are not equal. The point is that crops fill their grains and the content of each grain is relative to the fertility of the soils on which they are grown, not mentioning other factors involved. Crops grown on deep soils bear heavier grains because each grain is stuffy inside whereas those grown on lighter soils develop grains with lighter contents. Villagers'

mental schema of crops and food is thus extended to their perception of soil fertility and agricultural productivity or vice versa. I was told that some farmers are concerned of this when they lend crops to others but it is difficult to avoid it because of social pressure. From the way I was told, it sounded that farmers with better land are generally favored as a borrowing partner rather than those with less fertile soil. It is likely that this perception could not have existed if weighing balances were in use among these communities.

Another important factor related to agricultural productivity is whether the soil is receptive to fertilizers. *Walka* or soil that retains good moisture is fertilizer receptive given that its degree of infertility requires this input. *Çinça* soil, as the least moisture retaining, is also the least amenable to use of chemical fertilizers. Lack of adequate moisture and shallow rooting achieved on such soils would cause the crops to die from the fertilizers' undesired effects. In this regard, that lowlands are largely not amenable for application of manure is an old knowledge. It predates the introduction into the country of chemical fertilizers in the 1940s. For the same reason, a considerable part of the Amhara National Regional State and the rest of the country are categorized as regions less favorable for the application of chemical fertilizers (ILRI, 2000). In the Amhara region, Wärräbabbo is among the least chemical fertilizers using districts. For the same reason, the use of traditional and modern composts is affected even though currently nearly all rural households apply these resources on their fields.

Two of the sources of farmers' understandings of soils are the ecology of the soils themselves and the smallholder-soil interaction, especially in the process of agricultural production. A farmer can apply these sets of knowledge, which are, more or less, held by all the able-bodied members of these communities. It is not conceivable for one to be a good farmer without the basic knowledge of soils and the skills required in their management. In Gäddärro, different vocabularies are used to describe the environment. Yet it appears that the

linguistic dynamics between soils and farmers is more complex than I was able to determine during formal interviews. Farmers need to have physical contact with soils to talk about them in detail. For instance, most of the soil qualifiers I found were revealed during their accidental encounter with different soil components in the field and discussions raised on the spot. This compares with what Pálsson noted of Icelandic skippers who have "difficulty verbalizing their complex experience and intuition" (Pálsson, 2006) and with Ingold's enskilment theory (Ingold, 200). It also goes in line with Murdock's description of TEK as more of visual-spatial cognitive style (as cited in Wolf et al. 1992). One interpretation of why this is so is likely to be the highly variegated nature of the soil environment. Another probable reason is that the perception of soil as a cause of concern in agricultural production is relatively recent in their history.

The high tendency for individual farmers to employ different terminologies would reveal that local standardization of the languaging of the soil environment is not yet 'complete'. Cotton said "while some traditional knowledge is recognized in lexical terms and can be revealed relatively easily, other knowledge-such as that which is encoded in *behavioural scripts* [italics in original]- has frequently been overlooked in ethnobotanical data collection" (1996, p. 72). This challenge remains to be tackled in the process of future documentation and analysis of TEK and its integration with WSK. The scientific method heavily depends on the lexical scripts rather than the behavioral. Ellen (1982), in a similar manner, suggested that specific knowledge that is gained through personal experience is less likely to receive linguistic recognition. Alcron has also noted that not all traditional knowledge is expressed in words (Alcorn, 1989, as cited in Cotton, 1996). My findings reveal that lexical scripts are likely to have undergone several complex processes before their standardization and inclusion in the common linguistic pool of resources. Therefore, during their early stages much TEK and

practices might appear to lack verbal expressions because they are not yet mature to be so.

As already stated, soil categories have differences in their appropriateness for crops. Soils of the first category are fertile and most suitable for nearly all crops except lentils, linseed and peas. Those of the third category are least productive and the only crops supported by them are these same crops that are not suitable to the first category soils, according to local knowledge. The mid-level productive soils, those in category two, could support all the crops suitable for category one soils though yield has to be compromised. Generally speaking, these soils are also considered less suitable for lentils, linseeds and peas. In this respect, there is a wide gap between farmers' and experts' knowledge of soil productivity. According to experts, all crops indiscriminately need fertile soils for an ambient growth, production and productivity. Contrary to this, from experiential knowledge that cuts across generations, farmers discredit expertise knowledge that this is so. Lentils, linseeds and peas grown on fertile and second-level fertile soils, according to farmers, overgrow spending the food and water that could have been used in flowering, budding and grain filling, just to stems and leaves. What is more, as the overgrown plants fall from overgrowth and clumsy stems, it is said, their harvests are exposed to further damage. These findings evince the perceptual difference of the two models of knowledge regarding what type of soil is needed for what crops. In this regard, local knowledge is also likely to have contributed to the cultivation of marginal hill lands to support the cultivation of these poor-soil loving crops. (For the characteristic features of the major soil types and their agricultural qualities see Appendix 8).

Among farmers, the terms soil, land and earth do overlap and sometimes replace one another. As a result of this conceptual kinship, the cultural understandings of land could also be applied to soils to a certain extent. Regardless, there is important semantic distinction the consideration of which

helps to understand better the meaning attached to soils as agricultural resources. Farmers never made such phrases as "access to soil". Such phrases as "someone has fertile or infertile soil" are also rare. However, when a farmer says "I have good or fertile land", actually he means he has good or fertile soil. Similarly, access to fertile soil is expressed in terms of access to land. And when a farmer losses his land, he would say, I lost my land and not my soil. The only instance I heard a few of them say "I lost my soil" was when they lost some soils because of flooding during "heavy" rains in 2007. Even then most of them were saying "rain/flood kicked my land". In this line of thinking, access to land is taken for access to soil. Hence, traditionally, farmers were worried and toiled to have access to land and not soils. Of course, figuratively, at least in the two broadly spoken languages in the country, the term *"afär*" (that is soil in *Amharic*) and the term *"biyyé"* (which is also soil in *Afan Oromo*) are often employed to mean that something existed inexhaustibly. Therefore, in the traditional sense, land has always been jealously guarded as a property whereas such a conception has been lacking in for soil. The valuation of soils as scarce resources, which is a local perceptual shift, is basically the result of the diminishing return from this resource and land shortage. According to oral history, this has become a growing concern since the second half of the 20th century. Coupled with government agricultural extension intervention over the last three decades in Gäddärro, farmers' understandings of soil erosion and declining soil fertility have been improving and, today, there is a distinctive perception of soil forming as a resource separate from land.

7.2.1 Local Knowledge of Soil Erosion and Fertility Depletion

Farmers' conception of soil erosion is equally interesting and enlightening. Soil erosion is conceived as a result of both human and natural agency. On the part of humans, there are many instances in which people could cause soil erosion: people hoe, cultivate and graze their animals. When these are not

coupled with wise soil conservation activities, the soil is exposed to erosion by wind and water. The fine details of this conception go to the extent of holding human and animal feet as factors of soil erosion. As the well-known saying in Gäddärro goes, "Water and hyenas follow humans' footsteps".[124] It says that even the basic requirement of physical mobility renders human beings a factor of soil erosion. In another related saying, "Water follows human beings and livestock's footsteps", animals are added as agents of this environmental problem. These sayings suggest that without being equipped with tools and implements humans are inherently erosive to the soil environment.[125] Accordingly, any physical movement on the land is conceived as potentially erosive to the soil.

Plate 4: Village alley in Mïsïräta turned into a trench and erosion line after repeated impact of human and livestock feet

[124] Field notes

[125] The notion of movement in human-environment interaction is even more interesting when we see the revolution in transportation technology over the last one hundred years.

Soil erosion also results from natural processes without or with minimal anthropogenic interference. Parts of their mountains such as Hat'ät'i, not much cultivated and put under grazing as far as my informants could memorize, have nevertheless been eroded over a long time. Such erosion is attributed to natural geo-physical features and processes such as steep slopes, torrential rains, and poor vegetation cover. Further to this, their concept of erosion also encompasses nutrient depletion, without or with a minimum notion of physical displacement. In this regard, various nutrient enrichment measures and bio-physical structures and activities are widely acknowledged as strategies to combat not only the problem of soil depletion but also that of land shortage. Though still largely traditional, today, farmers in Gäddärro employ steel plows, axes, sledge hammers, a few chemical fertilizers, some pesticides and a number of short-maturing crop varieties. All of these have enhanced their extractive capacities in relation to soils. In this process, their perceptual and cultural knowledge of soil erosion and fertility depletion has also improved. Government and international interventions, particularly since the second half of the 1980s, have a share in this regard.

Plate 5: Roadside land denuding from steep slope and excess rain

It might be interesting to raise the question 'how do farmers notice soil erosion on their fields?' First of all, farmers realize that there is threat of soil erosion when the soil is visibly washed by water. Crop performance in a field is also compared to that of preceding years. Also compared is the performance of their field crops with those of others in the locality, if the micro-ecological similarity supports such an evaluation (*măğärräb*). If crop growth is retarded, in the absence of physically perceptible soil loss, this is likely to be translated as soil erosion subtly taking place on that specific tract of land - the crops on the same field could develop different patterns of growth. At the end, harvest reduction compared to earlier years and not explainable by observable soil erosion or other reasons is interpreted to result from *in situ* nutrient depletion. In most of the cases, unless precluded by other factors such as household labor or economy, this is a reason so sufficient to cause a farming household to recondition the soil, rehabilitate physical structures or build new ones. In the past, fallowing used to be the best solution.

At first sight, the knowledge that soils could lose their fertility without involving physical displacement seems to be just developing. Let us look at what Yïmam, a farmer from Mïsïräta and also my assistant, remarked. He said,

> If the soil is not washed away, the nutrient of the soil is not affected. Of course, the water can take soils slightly layers after layers [in a process called *mant'aläl*]….Otherwise, the soil cannot be impoverished *in situ*….But if you do not put manure on the land and over-cultivate it for many years, it will be impoverished without erosion.[126]

Contained in this remark are double meanings: soils are not eroded *in situ* and that they are. As I discussed this issue with development agents in the area, most of the farmers' have limited knowledge that soils could lose their fertility *in situ*. At first sight, it might also appear that the same observation is reflected by this farmer quoted above. Even though the gradual and slightly

[126] Interview transcript

washing of the soils from a field might not be always perceptible, it is difficult to take it as a testimony that farmers lacked the knowledge of soil fertility depletion without involving physical displacement. Crop rotation, the most important, and perhaps, the oldest traditional soil fertility maintenance technique, is a direct reflection of their knowledge that soils could lose their fertility *in situ* from over-cultivation and the repeated planting of same crops. Of course, many farmers know that if a land is repeatedly cultivated for many years without applying manure on it, the land will be impoverished without erosion. Therefore, in order to recuperate and maintain the fertility of land, different physical and biological methods are applied by farmers. This notwithstanding, soil erosion is regarded as a problem to be mitigated and not to be controlled.

Plate 6: A severely eroded gentle slopping field in Qädida

The reason it appears that farmers lacked knowledge of *in situ* erosion is that not all local environmental knowledge is explained or theorized (Murdock; as cited in Wolfe et al, 1992). It is interesting to note that the use of legumes to fix nitrogen from the atmospheric air and fertilize the soil, in their crop rotation scheme, was not theorized. According to farmers, the knowledge that the root nodules of these crops fertilized the soils came only with the arrival of agricultural extension advice and education. In this specific case, scientific knowledge was well-integrated with local knowledge, also contributing to some acceptance of leguminous forage plants introduced by government. The same experience has been documented by Cotton (1996) among traditional Mexican and Central American communities, which, as a result of generations of experience and experimentation, routinely use the custom of planting leguminous trees in their fields. While these farmers know the benefit of doing so and its elaborate techniques, they are, like their Ethiopian counterparts, unaware of its explanation. Nonetheless, from conventional scientific point of view, the root nodules of such trees and crop legumes harbor bacteria that fix nitrogen from the atmospheric air enriching the soil.

The following excerpts from my observation notes add relevance to farmers' detailed knowledge of soil erosion. When I and my assistant, Yïmam, came across some farmers in flood affected fields one morning during August 2007 in K'ädida, many villagers had already taken to their fields to inspect and evaluate the damage incurred by the heavy rains of the preceding night. One of the farmers we came across first, said, in an apparent reference to me: "Look what the rains have done to me".[127] A field of teff not taller than 10cms approximately was attacked by runoff coming down from the top of the mountain, burying most part of the field, consequently. The heavy rains that poured overnight had affected several fields in the same manner, threatening to damage even some houses. That morning, we already had heard several complaints from villagers as we were ascending the Lugo section of Gäddärro

[127] Field notes

Mountain. From the way these farmers were addressing their complaints, it appeared they thought I was a government official with some influence to change the situation. I felt obligated to state that I had no affiliation with any agency of probable significance to seek solution to their problem. I added that I was only there and making reconnaissance visits for academic research. After a while, not being very conscious of what reaction the remark could cause, I accidently commented, "Yes, but the flood has also brought in fertile soil?" Luckily, my remark did not instigate any sense of offence, at least as far as I could determine. The farmer replied in a cool-hearted tone, "Yes, it is fertile soil but it is good only for the next season's harvest, not now".[128]

We took leave of these farmers and a short distance away I noticed a field of beans apparently thriving well. Though this field was also partially flooded, as I inspected it closely, the crops were tall and sparse enough to have the floods settle onto their bottoms before stifling them. Those around commented that the deposited soils in this case could be beneficial rather than harmful, because the crops had been tall enough to outgrow the level of the flood deposited soils. Thus, it was understood, the plants could make better use of the transported soils to thrive further and give better yield.

In broader terms, these farmers conceive of soil erosion when the following conditions are present, among others. These are when the soil is washed by water/when flooding takes the soil away (the fertile soil); when household refuse and manure are not put on the land for a number of years in line; when there are no terraces, bunds, and trenches (*duga*) built on the land; when fertile soil is driven away by wind; when livestock break the soils, and expose them to erosion, especially on hill lands; when trees and other permanent vegetative cover are cleared from an area; and when there is no crop rotation.

Overall, farmers' knowledge of soil erosion involving displacement of particles could be analyzed at four successive stages. The first involves the

[128] Field notes

loss of soil at the level of a plot. The second involves soil loss at the level of different plots belonging to a farmer. The third takes place at the level of a micro-watershed involving plots owned by several farmers living in one or more villages. The fourth is erosion that transports soils from one region or larger geographic area into another. At the first level, soils washed away from a plot of a farmer may settle down before leaving the land partly or in full. At the second stage, soils that might leave the plot thus may be trapped in downstream plots belonging to the same owners. At the third level, soils eroding from upstream plots owned by different farmers could enrich the plots of those down streams, perhaps until the valley bottoms are reached. At the fourth level, all the soils removed by erosion reach rivers that take them away to where they will no longer be agriculturally utilized by the sending communities. According to local knowledge, this level designates the ultimate soil loss due to erosion from all farms, grazing lands, footpaths, homesteads and other conceivably erodible spaces in their entire micro-watershed. The soils thus transported escape into gullies, streams and rivers such as Wäkkällo and Mia in the case of Gäddärro, both of which are tributaries of the Awash River. Small streams and valleys that dissect the massive mountains of Gäddärro play their part in drifting away soil and related substances into these rivers. Farmers' awareness of erosion as rated by a development agent in Gäddärro, in 2007, was low for splash and sheet erosion; high for rill erosion; low to medium for *in situ* erosion and very high for gully erosion. My observation generally holds with this judgment. Farmers' knowledge of soil erosion encompasses all the three processes of detachment, transportation and deposition (Assmo with Erikson, 1994, p. 2) and the complexities involved in these processes. Their knowledge of soil erosion by gravity, even without direct human intervention, as in cases of intense denuding hillsides, especially during heavy rains, is another sign of the sophistication in this regard.

The movement of soils and nutrients from one place to another is described as the 'geographical transfer of value' by Blaikie and Brookfield (1987). This

upstream-downstream relation is an interaction of spatial scale which these writers considered to be crucial in land management (1987). This scale applies in their analysis of soil erosion, restoration and loss- be it at field, plot, village, region, country and sub-continental levels as in the case of the Ethiopian soils that have been enriching Egypt for millennia, and the positive impact of the conservation of highland Nepal which is said to benefit more Indian populations than Nepalese in the Gangetic plains (Blaikie and Brookfield 1987, p. 65). In a way quite related to the local knowledge of soil erosion discussed earlier in this section, Blaikie and Brookfield had to say, "One person's degradation is another's accumulation, and this is equally true of uphill and downhill positions of a slope, regions and even continents" (Blaikie and Brookfield 1987, p. 14). As a result, they argued "a more sophisticated set of criteria" are needed to understand and evaluate soil loss and their impacts on the wider society.

Mike Stocking, in a chapter called "Measuring Land Degradation", discusses how "such [scientific] measurements are unreliable because of different technical and ecological problems, including the problems of scale" (as cited in Blaikie and Brookfield 1987: 52). He argues that extrapolating results from experimental plots to an entire catchment area, a region and a country, would miss accounting for the actual loss of soil incurred because they often calculate the amount of soil loss without accounting for re-depositing soil particles. In a way comparable to the local knowledge discussed above, he added, "the complete removal of one 'unit' of soil may require several storm events over an extended period of time, but on the experimental soil-loss plot it would have needed only one such event" (as cited in Blaikie and Brookfield 1987: 53). This observation goes in line with the impressive local knowledge that moving soil particles could resettle before leaving the same plot. Therefore, it is difficult to rely on scientific soil loss estimates which are always exaggerated and terrifying. In here, there is an opportunity that scientific methods could be supplemented by local knowledge (Cf. Nuttall,

1998) in order to arrive at a relatively reliable conclusion about the actual soil loss a given community is incurring. The local, ground-based observation of soil loss by farmers in Gäddärro, as discussed so far, does not quantify the annual loss of soil in tons from a given unit of land as do scientific measurements on experimental stations. Nonetheless, it shall contribute to the development of what these writers have termed "a more sophisticated set of criteria".

Local knowledge also allows a degree of tolerance in soil-loss problematization. Again, my informants maintained that not every soil lost from a plot of land is economically significant. Therefore, there is no care given for soil loss that is perceived economically non-destructive. This could mean that the concept of 'soil loss tolerance', introduced by the US Soil Conservation Service in the late seventies, was discovered by these traditional farmers perhaps quite ahead of the Service. Framed on the need to reduce the meaninglessness of soil loss in economic terms, the concept was defined as "the maximum level of soil erosion that will permit a high level of crop productivity to be sustained economically and indefinitely" (Wischmeier and Smith 1978: 2, cited in Blaikie and Brookfield, 1987: 56). This concept is one of those employed in land use decision making in the United States but it has also received criticism as being too restrictive constraining farmers and as being too lax encouraging them to tolerate excess soil loss. This comparative analysis also strengthens the conclusion that there is much technical limitation placed on science which could be supplemented by TEK.

Soil and water conservation structures built to decrease and mitigate soil erosion under government sponsored and executed (donor sponsored) projects have been somehow seen as factors exacerbating the problem rather than improve it. It was complained that such structures as soil bunds took more agricultural space. In cases of soil bunds, mostly built on private farms, the soils used to build the ridges might be washed partly during heavy rains. The

space along the bunds from where the soils are taken away wastes land for some seasons until they are re-filled by soils to support crops. Eye-brow basins dug for tree planting and some other structures are partly conceived as exposing the soil to further erosion. Such structures are usually built on hills and public lands to support the planting of trees. Gully treatment is also perceived as problematic by some farmers. Those I talked to said that the gullies *(šäläk'o)* are blocked by *kïrrït* (check dams) causing them to overflow rather than accommodate the floods, especially during high rains.

Government restriction on draining excess water from ones fields into river courses is generally seen as a cause of soil erosion and crop damage. In a group discussion, a farmer had the following to say about the restriction on this traditional excess waters management system:

> You know why flooding is on the increase? Flood water used to go along its natural course, the *šäläk'o* [stream]. Now they built *kïrrït;* they blocked the way. When it rained we used to drain the water along every drains, ditches and *boy* [draining furrows] to take excess water to the river course. They say the land is now protected; but I say it is not. We say the land is protected when rainwater is drained into the *šäläk'o* like we used to do in the past. Our fathers used to drain away the water into the river course one after another [that is a relay system]. In that case, you, for example, cannot be a cause to flood my fields. Now they said it is prohibited to drain water out of your fields into the *šäläk'o.* We are prohibited from doing that. If it were in the past and let us say the three of us have fields one after another in the course of the slope, I would consult you that there is small deceptive water on my field; what if I drain it to your field before it gets serious. You agree and ask the farmer next to you to do the same. Then the water is safely drained into the *šäläk'o* before causing problems. This was the tradition. They prohibited us from doing that now. They said, have your own *kïrrït* [bunds] in your field and treat your water there. They said no relay system because this would devastate the country by flooding. But floods that overflow bunds are taking away fertile soils into river beds. The old relay system is said to give momentum to the flooding now. We want them to study the effectiveness of the old system to reinstate and keep our benefit.[129]

Such complaints, shared more or less by farmers in all the villages researched, exist amidst positive views about most of the modern conservation structures. For instance, the same group which had the above complaints had appreciated the importance of cut-off drains built by government on mountain tops in

[129] Interview transcript

other villages in the neighborhood. As already mentioned in this chapter, the application of chemical fertilizers, which has been still on a very slow up-take in the entire district of Wärräbabbo, is also viewed as a soil degenerating factor by farmers irrespective of their immediate benefits on wet land.

7.2.2 Agriculture as a Factor of Soil Erosion and Fertility Depletion

Agriculture has often been cited as the most extractive mode of production from the land. The schematic representation of the land use cycle in the preceding chapter can be taken as a reflection of this knowledge. At each stage of the cycle, except when a piece of land is left fallow, continuous extraction of soil nutrients is carried out by means of field crops, trees and livestock. At different stages of the cycle, different farming practices are employed, some of which are largely influenced by culture, and some others, by nature. In this process, the different crops grown over the years have had impact on soil fertility in different ways.[130] Trees that have been growing naturally and those planted recently have contributed to the sustenance, enhancement or degradation of soil resources because of their bio-physical attributes and associated agronomic practices.[131] The role of livestock has been no less destructive. Coupled with the cultural predisposition in favor of large, uneconomical numbers of animals and their husbandry, mainly uncontrolled grazing, livestock have largely contributed to soil erosion. Their value as a source of manure has become increasingly reduced because of the widespread use of their dung as a source of household energy. The reapplication of ashes after animal dung is burnt has not balanced the negative effect. All these experiences are understood by local knowledge as they are by scientific. In what follows, I describe and analyze the different farming practices smallholders' consider responsible to be aggravating soil erosion and fertility depletion on their fields and the rest of the ecology.

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[130] See Chapter Ten for the detailed ecological impacts of the major crops grown as perceived by farmers.

[131] See Chapter Nine for the detailed ecological impacts of major trees in Gäddärro.

Cultivating hilly lands: The general geomorphology of the area coupled with other factors forced many farmers to cultivate even very steep lands until this was reduced as a result of government prohibition. This cultivation could bear high soil erosion even when conservation structures are built. There is good awareness of this by farmers in Gäddärro such that hilly lands are developed into gentler slopes of terraces. This practice is documented as one of the major causes of land degradation along with other poor agricultural practices among farmers in Dire Dawa Administration (Wegayehu, 2006).

Plate 7: Hill land cultivation in Kibi Méda

Vertical tillage (yä'awdät/yäzïk'ïzïk' ïrïša): This plowing technique is quite traditional and no farmer I spoke to could trace its origins. It is employed for two major reasons. Farmers sharing contiguous plots might need to plow their adjoined farm edges vertically in order to avoid compaction of each other's

land during plowing as the oxen in yoke take turns. Secondly, the natural layout of the margins of many fields is inconvenient for contour plowing. On such fields, after the major horizontal plowing is done, the two edges of a field are vertically re-plowed to cut missed land. The increasing shortage of land is said to have increased the need for this plowing as uncultivated grass strips of land locally called *wäbär* and left between fields as natural boundary markers and as sources of forage, have been largely incorporated into crop fields in the hunt to expand cultivable land. Hence, as fields were literally combined, it became difficult for farmers to work a field without causing impact on the others'. Accordingly, vertical plowing became a social issue in addition to its technical nature. The outcome has been the increase in the practice of vertical plowing[132].

The problem is that following the vertical furrows the rains could gain momentum and drive the soils away. I have observed many farmers plowing the edges of the field vertically first and then the major horizontal plowing in order to lessen the negative effects of vertical plowing. This does not avoid the risk totally. Thus, social factors, location of fields, and land shortage tend to affect vertical plowing singly and in combination. Farmers planting adjacent fields with the same crop at the same time might not need to do the vertical tillage if they agreed. I have observed eight households tilling their contiguous fields at a time in one day during planting season in Awraççа. No vertical tillage was practiced that day. I have also heard some farmers complain about their neighbors who did not fulfill the requirement of vertical tillage. Vertical plowing is also done in a form of *säifa (fär k'ïyyära)* to get the *sïbbät* (the inner most part of the topsoil*)* upside down*,* especially during

[132] This practice is said to be less of a problem in the lowlands because they still have better size of land compared to the highlanders like the Gäddärro people. Hence, they plowed without trespassing into each other's fields. Therefore, farmers unanimously agreed that one of the issues that have exacerbated vertical plowing is land shortage.

dry times. The way this technique is handled by different farmers is said to be influencing the degree the practice could invite soil erosion.[133]

Diagonal tillage (säïfa ïrïša): Primarily this is carried out to plow those parts missed during plowing horizontally along the contours. It is filler plowing. This technique is also employed to turn up the *sïbbät* in the hunt for fertile soil. The tip of the plow is readjusted longer than normal to achieve this effect, inverting the soil deep down and mixing it with that on the top. Farmers are aware that even a small prick by the tip of the plow as the oxen turn at the end of a field could expose the land to erosion, rendering this plowing technique problematic. However, there is agreement on the part of farmers: "*it is good for the land, for its preparation".*[134] While its plowing takes time, it is said to be "*good to the crops as well".* It is mostly practiced on *walka* (vertisols) or firm soil so that the clods are broken very well. If the technique is applied during planting, a shorter *sïbbät* (here referring to plow depth) should be applied to allow reasonably good rate of seed germination. Plow tips breaking soils on fallowed field margins have been given as starting causes of soil erosion which through time grew into some of the gully streams in Awraççça.

Crisscross tillage (mïsïk'ïlïk'ïl ïrïša): This tillage technique is practiced on *dingaga märét* (stony and rocky land) upwards, downwards or as it fits since the big rocks and boulders crowding the land do not allow patterned tillage.

Up-stream-downstream effects (diverting runoff): Floods coming from the top and the upper parts of mountains are threats to those in the lower streams. Such villages as K'ädida, Absaro and Bäk'alo are more exposed to this problem because of their location. In addition to heavy rains that could break and overflow structures, lack of responsible flood management on the part of upstream farmers (including mountain-top cultivators) is mentioned as a cause

[133]In Gobäyya and Hara, farmers plow vertically to drain away water because the area is affected by excess water.
[134] Field notes

of this problem. It involves conflict and accusation between upstream and lower stream farmers.

Demolishing and replacing bunds (dïb or kab): In the hunt for fertile soil older bunds are demolished. The fertile soils deposited along these structures are then spread over the rest of the plot to recondition the weaker soils. A replacement bund, sometimes weaker than the older, is then built below the old one as pushing the stones up is difficult. Otherwise, knowledge goes that the replacement bund is better situated above the older one. What is more, farmers might also need to forgo the benefit of collecting forage from these bunds. This does not mean that old bunds standing as high as three or more meters are removed. It is said this would affect the overall landscape, enticing uncontrollable erosion and flooding, in addition to the huge labor it demands to demolish them. The practice is largely limited to those younger bunds as old as three or four years. The advice of experts is rather to build additional bunds, leave alone remove those already existing. Farmers know that it could be a cause of soil erosion. Nonetheless, it is argued that there was no one who demolished the bigger *kab* or *dïb* built by their ancestors through *ğigi* labor. Of course, such bunds were repaired. While this was true, I had observed several farmers practice bund demolishing and replacement against the weak restriction placed by the local agricultural office.

Plate 8: Partial demolishing of a farm margin in Awraççа that was used as a bund and a source of hay (in search of fertile soil and expanding the field a little bit)

Demolishing bunds also includes the step-by-step hoeing of soil bunds covered by grasses such that they are completely eaten up within two or three agricultural seasons. Overall, it could be said that demolishing and replacing bunds have become part of the customary soil conservation practices in defiance to soft government restriction. This is a new agricultural responsibility made necessary because of sociocultural and ecological reasons. This practice, which could be termed 'bund rotation', has replaced fallowing as a traditional soil conditioning technique. The case also demonstrates that time-tested local knowledge and technology ironically fail to the test of time itself. As such, local practices are replaced by other still local practices suitable to the changed environmental conditions. Tesfaye has documented the

same practice in Maybar FA in Dessie Zuria (2003). In the face of the same government restriction, this practice, which he termed “moving bunds”, has rather facilitated the acceptance of stone bunds among the farmers he studied (Tesfaye, 2003).

Overgrazing: Local sayings already quoted serve as testimonies that there is knowledge of livestock as a cause of soil erosion if not properly managed. It is common knowledge that free roaming livestock could break the soils, young plants and conservation structures. In addition, farmers are aware that continually grazing a land without rest exposes it to further erosion. The mountainous topography exacerbates this problem further.

Plate 9: Grazing livestock on a steeply land is a cause for land degradation

Sharecropping (mäggazo): Local judgment of the environmental pros and cons of this socially arranged agricultural practice is divergent. I have come across many farmers believing that it contributed to the protection of soil as a result of the short time span of the arrangement, which rarely exceeded three

years. The farmer teaming up his labor, draft power and perhaps seeds as well (based on the type of agreement) tended to improve the soil in order to enhance his share of the produce. On the contrary, some farmers insisted that the tenant shall be enticed to exploit whatever soil fertility was available on the land, to enhance his short-term benefit and leave it finally. My observation of some sharecropped fields generally goes in favor of this latter understanding. There was a sharecropping arrangement, known as *gämït't'oš*, which had been in use when land was in relative abundance. It involved a virgin vegetated or patch of land that had been left fallow for some years and required much labor and time to be used as a farmland. The tenant cultivated this land and took the full produce for two or three years, depending on the agreement, while the owner of the land got nothing. The benefit of the latter was that the land was tamed or was brought back into crop fields, sparing him/her the arduous task involved in this regard. The term *gämt'oš* has a sense of *'bite and run"* and the second knowledge discussed above, regarding current sharecropping impact on cropland, could be attributed to this extant institution. Its death is primarily caused by land scarcity.[135]

Repeated land preparation: It is common knowledge that more softened soil is easily driven away by any one of the erosion agents. Farmers in Gäddärro, as in other parts of Ethiopia, practice repeated plowing in order to prepare the seedbed, achieve more water permeability, moisture retention and decrease the rate of weed infestation. This practice is also well supported by the extension agents who work on the basis of scientific knowledge, recommending as many rounds of plowing. Theoretically, farmers are not far from the experts' position. Unless for the incipient shift towards reducing the number of land preparation plowing and its absence for some crops such as field peas, it could roughly be said that local knowledge is also in congruence

[135] Theoretically, this micro-level case relates to the national debate over tenure security and its impact on land resource management practices.

with science. The old shift from minimum tillage to land preparation and then to intensive land preparation by repeating the number of plowing is locally explained to have resulted from a number of factors such as population increase.

Deforestation/de-vegetation: Because of land shortage, forests and bushes are cleared- in the case of marginal hill lands; the result has been severe soil erosion over the years. This has been carried out because of the expansion of croplands, timber demand for construction, household energy, household utensils as well as farm implements. My quantitative survey shows that cutting implements, namely sickles and axes of various sizes, are the most superior in numbers within the pool of traditional farm implements (My survey, October 2009). Local knowledge has it that the intensity of soil erosion now is decreasing compared to the past.[136] Caused by population pressure, increased soil infertility and increased demand on the soil, there has been growing demand for more agricultural space over the years. Principally, this has been met by claiming spaces used for grazing and trees. Thus, many marginal and hill lands were turned into croplands. Parts of the land forms known as *gora* and *dagät* (see Chapter Six) have thus been converted into croplands in many instances. Although most of these spaces have been replanted with trees by private and paid public labor, the hills are not yet fully re-vegetated. On top of the factors just mentioned, the customary "lack of knowledge[137]" is given by villagers as a major factor for this. However, this factor needs to be inspected cautiously. It could be employed to exonerate the self and to shy away from genuine discussion.

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[136] Preemptive public destruction of trees and forests during power vacuums in the country had tremendous impacts in further thinning the already depleted vegetation coverage of rural Ethiopia.

[137] This response on the part of farmers should not be taken on its face value unless one deeply explores the case. It has become almost a weak strategy of averting responsibility and serious discussion. Otherwise, farmers very well know of their environment and what they do to their environment even though their lack of knowledge described as 'pre-scientific' and 'mystic' (Dessalegn, 1991) and 'ignorance' (Kebede and Hurni, 1987) could be undeniable in some respects.

7.3 Soil Conservation and Other Fertility Management Practices

There are different ways of maintaining and sustaining the fertility of land in Gäddärro. The major ones are letting rubbish and other biomass such as leaves decompose on the land; applying traditional manure; applying modern (compost) manure; applying chemical fertilizers, protecting the land from erosion by means of physical structures such as bunds and some biological measures; diverting run-off away from fields by constructing physical structures; trapping silts by digging trenches; abstaining from cultivating very sloppy areas; planting trees, especially on sloppy areas; abstaining from free grazing or instituting stall-feeding; crop rotation and area closure based on local knowledge and expert advice. Chemical fertilizers namely DAP and Urea, introduced into the country by the imperial government in the 1940s, reached Wärräbabbo only in the 1980s. Since the district is one of the drought-prone areas in the country, their application is ecologically limited to spots with better moisture retention capacity. Coupled with this, the increase in the cost of fertilizers, which is also caused by the withdrawal of government subsidy some years ago, as well as the negative social experience farmers had undergone when chemical fertilizers were introduced in the 1980s, have contributed to an insignificant use of these inputs among the research communities and the entire district of Wärräbabbo.

In local understanding, SWC structures are categorized as traditional and modern. Traditional structures are the ones that have come passing from their ancestors through time and those innovated currently. Among the traditional ones are *kïrrït* (check-dams), *t'ämäk'* (leafy matters) and *dib* (bunds). *Kïrrït* can be made of stones or soils. *T'ämäk'* can be of thorns and leafy branches. *T'ämäk*', in most of the cases, are put to protect small rill erosions for a temporary and even momentary period when there is rain. Most of the times, they will be destroyed when the harvest is collected. *Kab* and *boy* (in marshy areas) are among the structures that farmers call primitive. Modern structures

are the ones introduced by governments and the NGO/donor community over the years. Even though there are no local terms for what scientists call physical and biological soil conservation structures, crop rotation is good testimony that both of these practices existed since the long past.

7.3.1 Physical Soil Conservation

Soil conservation, as already discussed, has been a recent phenomenon in the agricultural history of Gäddärro, absent until soil erosion or fertility depletion was felt as an economic problem. Once it has been made part and parcel of the agricultural system, there have been just limited traditional techniques for quite a long time until after the 1974 famine. This was the time the then Ethiopian government and international relief agencies started the construction of modern or improved soil conservation structures as part of rehabilitating both the bio-physical and social environment of the Ethiopian farmers. Until this time, the physical structures called *dïb* and the ditch called *boy* to drain away excess rainwater from the farmlands were employed. Tree branches (as *t'ämäk*) were also employed to block rill erosion from growing into sheet and then gullies. Otherwise, the availability of ample land allowed fallowing; the vegetation cover prevented or lessened erosion; single and lighter tillage did not let the soil so lose and the hills vulnerable to erosion were not dug. In general, agricultural activities' impact in exposing the soils to erosion was minimal because of these and other factors. As a result, the soil conservation techniques and practices were also minimal.

As part of the Ethiopian governments and the international community efforts to combat drought and famine, the issue of soil erosion was given serious attention and international resources were invested in soil conservation measures across the country, including Wärräbabbo. These are more than a dozen soil conservation structures in Gäddärro. Different schemes named food for work; cash for work; employment generation schemes and productive safety net programs in which able bodied villagers worked for a wage have

been carried out over the years in that order. These schemes have resulted in different soil conservation structures built across the country. The structures have been built on both government and private holdings, including hill lands and farmlands, in order to protect a watershed and improve soil quality on private holdings. On top of this, individual farmers build traditional and modern conservation structures on their holdings to improve crop production and productivity. (For traditional and modern physical soil conservation structures and their periods of introduction see Appendix 9)

Plate 10: Building soil bunds in Mïsïräta on paid public labor mobilized from different villages

As a rule, farmers generally start building soil conservation or protection structures after the problem has started and when there is yield reduction or when they feel there will be such an immediate reduction. Otherwise, they will not build these structures except when a steep slope renders cultivation difficult and the slope had to be treated. When farmers feel short depth or *sïbbät* as they plow the field and the soil is visibly washed away by rainwater, then they could build structures to protect *their* soils. Without these reasons,

building these structures is regarded as a waste of labor, as the cost is not considered to be worth the benefit. There are also farmers who might associate production reduction with faulty tillage and lack of soil fertilization, rather than lack of conservation structures or soil erosion. Nonetheless, the knowledge that soils have been generally exhausting and farmers needed to serve the soils in order to be served by these resources, is shared by all. Apart from knowing the problem, decision-making whether to build or not to, or what type of structure to build, differs from one farming household to the other, based on labor availability, capital, personal determination, geo-physical quality of the land and related factors. Soil conservation structures are normally built and maintained during the dry months.

In the quantitative household survey, nearly 64% of households responded "yes" to the question "Do you experience soil erosion on your farmland?" The rest responded "no". Nonetheless, 97% of them have built SWC structures on their farm plots. This suggests that while the perception of soil erosion is very likely to cause farmers to build these structures, as also revealed by the qualitative data, building these structures is also quite likely to stop the perception that the problem persists. What is more, as already stated, some of the structures might have been built to treat bad slope than prevent soil erosion. Therefore, for these farmers, building these structures are more than protecting soils on agricultural land. Nonetheless, this should not be taken to mean that these structures lack economic benefit in raising production and productivity. The qualitative findings have revealed that not all soil erosion is necessarily a cause for reduced production and productivity. This also holds with the information I got from a few informants that the original reason for SWC structures was not protecting soil or conserving water but treat high slopes to facilitate cultivation.

Table 5: Number of households using different soil conservation structures on agricultural land (R= 128; M=105; F=23)

Name of structure	No. of households using the structure		
	MHHs	FHHs	Total
Stone bund	99	20	119
Soil bund	97	18	115
Check dam	44	9	53
Cut-off drain	44	11	55
Drainage	50	14	64
Ditch	72	10	82
Micro-basin	26	7	33
Eye-brow basin	30	6	36

R= Response; M= Male; F= Female; MHH=Male headed households; FHH= Female headed households

Source: My survey, Oct. 2009

From the table, we learn that the most widely used SWC structure among these communities is the bund that is stone bund followed by soil bund. Apart from conserving soil, these structures play a key role in forming steep slopes into cascading terraces made convenient for cultivation. More male headed than female headed households use stone bunds at a rate of 94 and 87 percents, respectively. *Duga* or ditch, meaning small pits dug in the earth in order to trap flood water and alluvial soils, is a recent innovation of the farmers themselves. This technique was started around the mid- 2000s. All the same, it was already successfully adopted by the majority of the farming households towards the end of 2009. The adoption of this technology has followed the traditional path as a farmer copied from the other on their own volition. In the face of unreliable rain and the need for soil conditioning, ditches are considered as one of the most important structures together with soil and stone bunds. In the case of ditch as well, 68.5% of the male headed households reported having built some whereas 43.5% of women households have it. Both of these tasks are exclusively accomplished by men as are the

rest of the SWC structures. This is purely cultural but from the qualitative data, women, rather than men, run against women trying such arduous tasks.

Soil fertilization has been one of the government interventions to improve agricultural production in the country. In Gäddärro, farmers were introduced to chemical fertilizers for the first time in the wake of the 1984-5 famine. It has been noted that the district of Wärräbabbo is among those moisture-stressed districts which are not amenable for much use of fertilizer inputs because of lack of enough precipitation. While there is variation within the district and even an FA in this regard the Wärräbabbo Agriculture and Rural Development Office has been promoting the use of fertilizers over the years along with other agricultural and rural development activities. Within the last three years prior to the survey, 103 households among from 132 did receive agricultural extension services. Those who applied commercial fertilizers in those three years were just 31 out of 128 households. While they used some DAP or Urea, the total amount of fertilizer used was quite insignificant. Out of the total, 24 of them got the supplies from the district agricultural office whereas just five got them from the Farmers' Service Cooperatives in Goha and another household from both sources.

Blue floods coming down from up-stream deposit fertile soils in trenches which farmers dig out and spread over their fields as soil conditioners. Conditioning soils by soils was never thought of and practiced before. As a result of this innovation, now farmers are in the making of a new custom of soil harvesting next to the government-introduced scheme of water harvesting. It seems that this innovation so far has not touched the heart of experts and government officials. Its role in saving eroding soil, which, according to scientific definition, and accounting of soil erosion, is considered a loss, has not yet been taken note of by scientists and experts.

Plate 11: Soil deposited by erosion from upstream before a part of it is fully lost

7.3.2 Biological Soil Conservation

Locally known as *makkär,* crop rotation is one of the biological means of restoring the fertility of soil as part of traditional management. Leguminous plants are rotated with other crops which consume soil fertility. Experts might be observed transmitting this skill but several decades before the arrival of agricultural extension, traditional farmers have been practicing the knowledge. Today, no single field is covered by the same crop as the one immediately preceding it. In August 2007, a farmer in K'ädida told me that some maize

crops were stunted and turned yellowish because they were planted on wheat stubbles before the stubbles were well removed. He said the owner was probably in a hurry to seed the field and that was why he did not do the land preparation properly. I thought the land/soil had deficiency of the mineral called phosphorous.

The planting of trees, hedges and grasses has been employed as a soil and water conservation strategy. Traditionally, grasses were let to grow and cover the bunds and relatively sizable spaces were left for this on bund tops. Of course, apart from serving as a soil conservation measure, these grasses also served as grazing land and source of hay. When the soils were thus protected from denudation and erosion, their water retention capacity increased, meaning that this technique also served to conserve water. Re-vegetation of deforested and degraded land through tree planting and the planting of forage trees, or plants in farmlands, based on the principle of agro-forestry, have been introduced through government and the international community after the famine of the 1973-74. Before that, eucalyptus trees could have served this purpose to a very limited degree in addition to the use of crop rotation to maintain soil fertility. Therefore, much of the biological soil conservation techniques being employed are historically quite recent and constitute the role of external agents in affecting farmers' relation with their natural agricultural resources (Cf. Kottak, 2006; Nazarea 2003). (For biological soil conservation measures in use and their period of introduction, see Appendix 10).

The application of manure is amongst the oldest and important techniques still utilized. It is common in all the villages studied to see fields with different developmental stages of the same crops. In August 2008, I witnessed red sorghum, maize, beans and other crops performing differently to the extent that farmers were suspecting the weaker ones might not yield unless it rained the whole of September. One of the major reasons for such differences within and among fields, apart from natural difference in soils, has to do with the

application of manure. Where a bucket of manure is applied and where it is not, explains the difference cogently. The application of manure depends on several factors such as the availability composting materials, livestock to produce traditional manure as well as human labor and pack animals.

Manure is mostly applied on land that does not give good harvest, which is also called *allïççа* land. Farmers know which land needs manuring from its performance. It is often said that it is women who make land fertile when, now and again, they apply garbage onto it, particularly if the land is around the homestead. Farmers believe that any land demands *wäk'ït* (to mean opportunities such as good weather); without which even fertile land will not give good yield. Once manure or fertilizers are applied, it could sustain the land for a number of years. These soil conditioning inputs are not applied on leguminous crops stubbles (usually beans as the one grown most) because the land is already enriched by these crops. They do not either apply manure or composts on each plot every year. One of the reasons for this, in addition to carry over effect, is that they do not have enough manure or compost to apply all fields they have at a time. Therefore, they have to rotate among fields, priority being given to the most affected plots in relation to the type of the crop to be grown on them. The other reason is that if the treated plot is not attacked by drought, it is possible to collect good harvest from the plot for two successive years without the need to reapply the inputs. This also depends on the plowing depth or the *sïbbät* achieved. According to local knowledge, if it is deep, the manure will go deep in the soil and it will last for longer times.

Composting is a new technology among these communities as in other parts of the country. Many farmers have been applying composts for the last five years but they still acknowledge that more work is needed. *Çinça* land, which is not convenient even for linseed, is said to be not responsive to fertilizers. It has just a thin layer of top soil. It is the same thing if manure is applied since the land is said to be "dry". All types of soil conditioning inputs need to be

applied on swampy or wet land that retains sufficient moisture. Otherwise, it is likely to be wastage of resources. The fate of such land is said to be SWC structures and borrowing soils from outside. Thus, the land could be improved (broken in farmers' language) through time. The other option is to leave the land fallow, which is nearly out of practice nowadays. When the land is rehabilitated it will be plowed again. Especially if there are borrowed soils, my informants said, the land will recover soon. If not, the most infertile, *wägäb* or *gät'aba märét* is said to need grasses sawn on it. Otherwise, it is believed to remain useless.

Plate 12: Fields with compost heaps to be spread over during plowing to treat the soil

Except for a few plants (such as eucalyptus, *k'ulk'ual*, castor seed plant, and *ïrét),* nearly all tree leaves, bushes and herbs are applied in the preparation of composts. The *ïrét* has sharp thorns which would not decompose so shortly. The castor seed plant leave is light when it is dry and its content as a humous is very limited. *K'ulk'ual* has rich wet-matter content and takes longer time to

decompose. The same is true with eucalyptus. Weeds themselves are important sources of compost. However, most of the farming households are said not to be preparing enough composts. Neither do they apply the recommended techniques in their preparation. There are some farmers who said they rather needed such plant materials as weeds for their animals. Despite that, especially during the wet months, when weeds are in excess and extravagantly used, there seemed to be much opportunity for more composting. Many farmers complained that laziness was the primary culprit for not using these resources adequately. In the past, people used to exchange manure with forage, but now farmers are so conscious to not let their manure go.

The preparation of composts is the most important agricultural technology that has been accepted and adopted by the great majority of farmers since early 2000. In my household survey, 124 out of 130 households did apply compost manure in 2008. Just four households out of 102 male headed and two out of 22 female headed households did not apply it during the year. The gender difference in this regard as well is insignificant. The role of women is given rather high value in the preparation and application of composts such that households without women are expected to be less efficient in this regard. (For gender and age-based agricultural division of labour see Appendix 11). This does not mean that those who did not apply it in 2008 have not used it before since there is a tendency to use it every other or every two years.

Table 6: Households who prepared and used composts during the production years 2006/7 through 2008/9 (R=130; MHHs 106; FHHs= 24)

HH Type	Did you apply compost manure in?								
	2006/7			2007/8			2008/9		
	Yes	No	Total	Yes	No	Total	Yes	No	Total
MHHs	102	4	106	101	5	106	98	7	105
FHHs	22	2	24	22	2	24	22	2	24
Total	124	6	130	123	7	130	120	9	129

Source: My survey, Oct. 2009

Unless the *sïbbät* is inverted, farmers say it is not worth applying manure or compost. Local knowledge has it that the soil and the manure/compost needed to be mixed. Then, the land will blow up and the crops on it will also be very good. Some do not do this and this could be taken as one of the various examples of individual differences within the collective application of otherwise shared TEK. The technique is quite complex and a good farmer needs to follow that. Plowing deeper and inverting the *sïbbät* is even said to replace the need for soil conditioners to some extent. Attention to such details of tillage affects the land not only for fertilization but also other important activities. Non-attention to these requirements because of laziness and excess leisure, or otherwise, are unanimously mentioned by farmers as important factors of reduced yield and impoverishment in their communities. In spite of the knowledge that the climate and the general environment is getting harsher, adaptive techniques such as mentioned here are believed to result in a huge yield difference. The local term *akkäsasäb (way of working the land as a farmer)* subsumes all these and other requirements in one concept. Time, is also an important notion in this regard. Good farmers are believed not to let the *nïšš* (moisture content) pass them. There is a widespread belief that one does not collect good harvest merely because s/he has cultivated his fields. In order to do so, s/he needs to be accomplishing these requirements.

7.3.3 Idiosyncratic Practices and Their Impacts on Others

A growing number of farmers currently cherish the practice of intercepting soils flooding down from upstream fields. This was started by the innovative work of an old man who converted a severely leached 'wasteland' in front of his home into a fertile patch where *çat,* maize; tomatoes and other crops have been grown. This man, Abäbaw Kïnfu, lives in Misirata. He transported (also developing an artificial floodwater way) flood soils trapped along the course of a gravel road, converting this barren land into a fertile garden since some years ago. That innovative practice was a complete reversal compared to the dumping of chemical fertilizers freely distributed to villagers by government around 1985. During the fieldwork period of this research, the idiosyncratic practice of Abäbaw had already started to bear significant impact on the emergence of a new conception of soil and its enhancement. It might be difficult to state this conception has already become an established culture even though many have reported in the survey that they have some *duga* to harvest water and also some soils. All the same, the trend appears to be suggestive of such an outcome in the near future. The perceptual and cultural changes and continuities in this regard might be better discerned from an extended case I and my assistant observed in Misirata in November 2007.

Around 9.00 in a morning, in a course of field observation, I and Yïmam, made our way to a farmer who was cutting some grass from his fallow land. Adjacent to the fallow land were some stripes of teff. We noted that the man had started cutting the teff harvest and even had put them in few piles. However, some of the teff crops were not collected and were still standing in the same field. It gave the image of a partly shaven head. Upon approaching him, the owner told us that he would cut the remaining teff after about 15 days. He said even though the field was one and the crops were planted on the same day, those parts with better soil germinated the seeds earlier than those with poor soil. The difference was also reflected in their growth and maturity.

Those which germinated early had also made good seeds, he said. He also told us that the fertile part of the soil was borrowed from upstream. We further learnt that he diverted the flood flowing down by the edge of his field into the field and had systematically retained the silts as he made the floodwaters meander from one terraced part of the field into the other, finally letting back much of the floodwater into its 'natural course' while retaining the soils thus trapped on his field. To this effect, he underlined that he took all the necessary precaution required to protect his and other plots in the neighborhood.

As we continued our observation, we knew that part of the land which did not receive borrowed soils was stiffer and shallower. Another part of the field used to be a fallow and was readmitted into cultivation before five years. The soil was so depleted and the hardpans started to be exposed in the part left fallow just recently. He managed to build stone bunds in it and that would contribute to the recovery of that portion of the land, as we learnt from him. There was a terraced strip next to (that is below) this portion of the land on which he had built stone bunds before two years. Comparing this terraced strip with the fallow land lying right next to it, he told us that he had built a thick mass of soil. His intention was, after a year or so, to demolish this bund and build a replacement bund below it. Part of the fertile soil that formed this mass of earth, he said, he collected it from the soil trapping pits he had dug just on the edge of the field. I and my assistance had the chance to observe these pits, too. Then, he had carried the soils into the fields with plastic sacks locally known as *kéša,* most of which arrive as containers of relief food grains.

We learnt from him that he copied the practice before three years from the old farmer mentioned above, who had innovated it. He also estimated that about 2/3rd of the farmers in the village did not practice this innovation. Of course, to adopt the practice, he said, there are some conditions to be fulfilled: the slope of the field; the water absorption capacity of the soil and the velocity of

the flood as it gets closer to the field (which could change from time to time based on the amount and intensity of rains). On some fields, he stated that it was possible to divert into the field slow-paced floods to enrich the field with 'stolen' soils. In this regard, he remarked this field of him was strategically located. As already said, the floods that were made into the field meandered from *tïlm* (terrace) end to *tïlm* that is along the edges of the bunds until the waters got back into their 'natural' flood course.

As he was hosting our visit, I perceived in him a genuine sense of narrating one's success to others. He was leading us from one part of the field to the other, talking, pausing, feeling the different soil depths from a spot to another and explaining out the difference. At a point, he grabbed handful of soils from the part that were enriched and those not. He made us fell and notice the difference between the two in color, texture and fertility. I was able to know the difference in soil fertility even in one field let alone between different fields in a village and among villages. Towards the end of our observation, Yïmam, who apparently was as novice as I was, and had been keeping aloof for long, remarked that fertile soil (*läm afär*) cannot give good harvest by itself, unless it was mixed and integrated with *däniḱ'oro afär* (poor soil, lit. deaf soil). He added that the fertile soil would lubricate the poor soil as an oil or ointment (*wäz or k'ïbat*). Nonetheless, he said he did not figure out until then the very idea of digging pits and harvesting fertile soil from floodwaters as an option because he thought it demanded too much labor. On my part, perhaps that was one of the most remarkable observations made during my fieldwork. It gave me the image of a traditional soil scientist lecturing to his pupils in the open air, in the outfield. I made some encouraging remarks and thanked our host profusely. Then, we left to reach out to the others who were also working out in the fields. Our discussion with that man was to be the beginning of many educative discussions to follow.

In the evening, the issue was raised in the presence of a farmer from the same village who joined us in our evening chats, which later became one of the fieldwork codes of practices between me and my assistant throughout the course of my fieldwork. Our guest remarked, "The man did this because he does not have other things to do. Farmers have not run out of soil; there is plenty of it. How come a farmer transports soil into his field as if it is compost or manure?" He continued as we were silently listening to him, "Shortly, you will have to see the farmers; everybody will apply compost on his fields".[138]

These cases are good illustrations of local innovations and differing local perspectives. They reflect perceptual and behavioral differences among farmers sharing generally the same cultural background, micro-climate and locality. The first shows how elaborate TEK of soil could be among these communities as pioneering individual farmers conceive new ideas, experiment them and achieve an innovation to be followed by others. It could also represent the indigenous transformation of TEK taking place outside shared perception and the network created by the government agricultural extension system. Thus, it epitomizes the dynamics of TEK.

[138] Field notes

Plate 13: Harvesting soil trapped from blue floods in duga in Mïsïräta (farmer working in the evening)

7.4 Conclusion

Human impact on the soils of the earth is likely to be as old as humanity itself even though the introduction of agriculture some 10 thousand years ago has tremendously increased its intensity and the industrial revolution of the last three hundred years has given it a grim picture. Therefore, as a result of many years of use, humans have been considered as the main factor of soil erosion across the world. The research communities consider themselves potentially erosive to the soil even without farming. Historically, humans are likely to have learnt from their mistakes and there have been both success and failure stories in managing soils as resources. The fossil fuel-based economy of the last three hundred years has, however, caused a breakup of the learning cycles in many regions of the world. The growing number of the world population and excessive *per capita* consumption have saddled on the fossil bounty to

affect further havoc on the soil environment, in both the rich and the poor regions of the world. The communities of this research have affected their soil environment negatively without being sophisticated technologically.

Today, as the world is struggling to end this breakup, both traditional and modern soil conservation strategies have been put into use even though the problem is far from being adequately addressed. TEK and WSK have been employed by farmers, states and NGOs over the years to mend the broken-up learning cycle and fix a lasting solution to the problem of soil erosion and fertility depletion. Terraces, mulching, the use of stones (including lithic mulching) and other techniques have been employed to protect soil from erosion among the research communities and in different parts of the world. The use of anthrosols and carrying the soils back to where they could be agriculturally used has been employed in some parts of the world and the practices today are employed in places where the soil is rendered weak.

The efficacy of the local saying, “He who has lent to the land is better than he who has lent to someone”, has become under challenge in Gäddärro. In its purely traditional sense, the lore reflected the relative security farmers enjoyed by reaping harvest after covering the land with seeds. There has always been some doubt on the part of farmers when they scattered seeds and expected harvest relying on the skies and the soils. The change represents the growing risks of the changed environment. Even though there are traditional soil conservation techniques that have been applied by these farmers, lending to the land in this lore largely meant receiving from the land without the need to pay it back. Seeding it and fulfilling the other minimum traditional farming requirements were simply considered as lending to the land till it was known that this perception was erroneous. The current understating is that farmers owe more to the land and its soils rather than vice versa.

It could be said that under this general framework, the communities I studied and the rest of Ethiopian farmers have cultivated the land and degraded their soils to a point where they could hardly thrive unless their traditional behavior is changed. The rudimentary traditional soil conservation techniques were not sufficient to ward off the huge land degradation problem these farmers have been facing, especially during the second half of the 20th century. Today, many traditional and modern conservation measures are applied on cropland, bush land and mountain landscapes in order to rehabilitate the weakened soils and the generally degraded environment. In this regard, both physical and biological soil conservation measures have been applied mostly since the mid 1980s.

The chapter has also conveyed a number of important themes in addition to uncovering the detailed ethnoecological knowledge on soils. In the first place, it has established that the local understandings of soils as a resource have undergone changes, including ecologically relevant conceptions. Traditionally, soils were taken for granted and there was less worry and activity to protect and conserve them. In the long past, the low regard for soils as a resource in need of investment was promoted by economic, political, cultural and ecological factors. However, through time, the same factors have worked as influences on these farming communities to reconsider the old knowledge and institute newer forms of understanding soils. Till the period these changes were to happen in the recent past of these people, it could be said that soils as resources were considered just natural. Nature which made the trees for them, as will be discussed in Chapter Nine, did also make soils for these people. A popular traditional symbolism associates soils with inexhaustibility. This local knowledge was ecologically deficient even though there were some local knowledge and practices which were supportive to the environment. Ultimately, the threshold was passed.

The old conceptions were largely detrimental. All the same, these rural communities and their leaders did realize this only so late, as they did with the degradation of the rest of the natural resources. The new ecological knowledge holds soils not only as natural but also as human-made resources. Thus, the concept of anthrosols, meaning soils made by humans, was brought to the limelight. The international community and the Ethiopian states following the 1973-4 famine and resource scarcity are to be mentioned among the important structural causes in this regard. The most important indicators of the new concept have been soil and water conservation structures and the reconditioning of the soils with fertilizers, traditional manure and recently introduced home-made composts.

With this shift there have also come new concepts such as borrowed soils and the transporting of lost soils back into fields and entrapping moving soils. Traditional application of manure to recondition soils could be taken as a rudimentary form of this shift, too. All the same, the new thinking is broader than that and has been a cause for newer local conservation practices. The conceptual shift has rendered soils more of movable resources. Before this, only stones, logs and in some cases, tree branches and leaves were applied as movable resources in relation to soil conservation in the rudimentary, traditional soil conservation practices.

Today, farmers are keen not to lose a handful of soil. Even though there is difference between individual farmers, the age is one of making soils rather than using made soils. It is said that in the past, working the land was a pensionable job without paying the land. Now this is no more. The current generations of farmers are faced with land that needed to be rewarded by humans if they wanted to have it as a pensionable resource. This perception strongly informs the behavior of farmers in their soil conservation decision-making. What is more, as the land is responsive to soil conservation measures, there has been no best educator to farmers other than the return impact of the

land itself. The current period is one in which both farmers and the state are struggling to transform agriculture from a resource using to a resource saving and conserving tradition. Such and related cases in this dissertation support the generalization that conscious and programmed resource management is not sufficient to guarantee a sustained use of natural resources (e.g. Balee, 1998; Tucker and Grim, 2001). What is more, it gives us the lesson that traditional conservation practices could be rendered unsustainable because of cultural and ecological factors but farmers could still fail to realize and nudge forward with their traditional practices. In such cases, the interventionist role of the government is to be appreciated even though it might be a long way before farmers have to accept this fully.

CHAPTER EIGHT: DROUGHT IS BAD BUT RAIN DOES NOT HAVE *'HAMBA'*

8.1 Introduction

Much less has been written about rain and rainwater in Ethiopia compared to its lack, which is drought. That more than 95% of its smallholder agriculture is rain-fed has rendered timely and sufficient rainfall a key 'natural' factor determining agriculture. The significance of rain in this regard is indirectly stressed through the emphasis on drought, explaining production failures, food shortages or famines. This chapter argues that a better understanding of one is not achieved without that of the other and their dynamics. The chapter begins with local understandings of rain and the indigenous knowledge and beliefs related to the origin, economic, social, political, religious and ecological aspects of it. The same is done with respect to drought. The detail cultural understandings thus revealed are expected to inform, if not influence, rain and drought management practices of smallholders. In this moisture-stressed, drought-and famine-affected district of the country, the chapter shows that farmers have a less demonized view of drought than 'excess rain'. I challenge the assumption that drought is the single-most problem of rural communities. A closer look reveals that farmers have good reasons for stating "drought is bad but rain does not have *hamba*", to mean drought is bad but rain is worse.

Thus, the chapter explores local meanings and values of rain and drought in relation to official and scholarly perspectives. In so doing, it emphasizes the details of micro-level perceptions and practices to combat drought and rainfall-related problems along with the application of scientific knowledge. Then, it describes and analyzes the causes and effects of drought and bad rain in relation to food insecurity and international relief aid. The chapter also discusses how rain/drought, as part of the natural rhythm we call season, has been culturalized through agriculture and how the latter is rendered incapable of adjusting itself to the changes of the former. On the whole, I treat rain and

drought as complex temporal and spatial processes involving economic, social, religious, political and bio-physical factors.

8.2 Understanding Rain: Benefits, Risks and Hazards

"Rain is the gift of nature and nature is God" is an oft-made local remark in Gäddärro. In a like manner, drought is considered as a heavenly punishment and its resolution depends on human supplication to God. Rain is sought in a religious manner through prayers and the fulfillments of the provisions of custom and God. Notwithstanding this, currently, there is divergence between local residents due to the infiltration of revisionist tendencies objecting to aspects of traditional religion such as *wädağa* prayers and the consumption of *çat* for religious services.

8.2.1 The Ontology of Rain

Local conceptions of rain have symbolic interpretations. Rain is said to be a symbol of God's laughter; an act of angels; a phenomenon linked to humans. Primarily, it is conceived as the source of all life and hence the embodiment of nature and a symbol of God's blessing. On the contrary, it is also considered a source of destruction or death, and hence, a symbol of the wrath of God. Economically, this means that it can be a major factor of good harvest and abundant food or poor harvest and scarce food. Thus, rain is ultimately considered a source of life and a source of death.

First and foremost, as in other components of nature, religious accounts of the origins of rain are the predominant perceptions in Gäddärro. Secondly, even though God is believed to be the primary and ultimate source of rain, it is also believed that rain originated from human beings. The logic here is that human deeds that appease God cause Him to have a fall of blessed rains that befits their deeds whereas human misdeeds that sadden Him cause harmful rains to befall them. The deeds that appease God are as innumerable as which sadden

Him, represented in the symbolic terms, *mäwwafäk'*[139] and *mäzualäm*[140], respectively. Rather than digressing from the belief that God is the source of rain, the imputation of the human factor is regarded as its consolidation. Explicitly stated is that rain has multiple sources (or causations), with blessed rains originating from a blessed source and cursed rains originating from a cursed source. This is nearly common knowledge in Gäddärro. Many writers (Dessalegn, 1996; Daniel T., 1987; Mesfin, 1991; RRC, 1985) have made note of this supernatural explanation albeit in very general terms.

Among my research communities, two myths told about the origins of rains are however nearly specialist knowledge held largely by sheiks and some elderly people. The first myth as narrated by one of my key informants from Awraççа, Bäkär Sämman, amidst a small crowd of men, went as follows:

As we live in this world, there are speeches that are true, speeches that are false and those which are not either. As we talk now there is an angel waiting for us to record the things that come out of our mouth, like you are doing. In the course of his job, there is a day for the angle to appear before God to submit everything he has recorded….Up on this, he will find cases which are neither false nor true. When he finds such inconvenient talks, which are not reportable to God, the angel has got his own means. When he judges that some talks are not harmful or criminal or beneficial or godly, he will throw them away into a sea called *baharäl zulma* [sea of sins]. After being in the sea for a long time, clouds will emerge from this sea when we humans commit sins. When those clouds rain, it will bring floods just in one day's rain; the land does not want the rain; it does not absorb it; it will also create gullies. The land knows where the rain was originated. We, however, say *at'äggäbäw!* [The rain treated the land very well]. Then, the rain breaks the *kïrrït* [the bunds]; overflows the *wänz* [the rivers] and drives everything away with it. It does so because it is not graceful[141]. Those who read the *Kitab* [the Quran] say this rain emerges from *baharäl zulma.* It is the place to dump all the useless talks. Not only that, all curses

[139] This term, in short, is defined as "to have love for one another" by some of the villagers I talked to. In detail, it refers to all good deeds among villagers in all aspects of life such as lending money to one another in time of need without interest. It also includes "auf", which is granting apology and writing off a debt to the borrower who has been truly unable to pay back. The term also includes such acts as refraining from doing harm upon one another, including sexual infidelity. In ecological sense, refraining from being a cause in the destruction of crops and suffering of livestock are also part of this notion.

[140] This term is the opposite of *mäwwafäk'*, some of the farmers I talked to described it as "to hate and harm one another". All bad thinking and deed that harm the other in every aspect of life can be included in the notion of *"zulmi"*, which is the root for *mäzualäm*.

3The version I documented is based on the impression that something which is not good or bad is finally bad or that something useless is bad.

made upon *harkäbas* [curses made on *wädaja* prayers]; all types of sins are taken away and plunged into this sea; they pile up there. When it rains from that sea, the crops and the grasses will be destroyed. Animals eating grasses grown by such a rain will have running bowels, and could even die. When we eat the meat of such an animal, we shall become *mäbsuk* [sick].[142]

This myth symbolizes a significant portion of TEK as well as WSK. I remember what one of my informants from Kibi Méda, Kebede Assefa, once remarked, "Religion is for us what science is for you".[143] Among many texts in this dissertation, this myth reveals that religion is an important part of TEK by which to understand the groundwork of nature. In the first place, the myth situates human behavior between small farmers and their Creator, at the same time rendering them responsible for natural disasters. The people-to-people relation inferred in this myth, as reviewed in Chapter Three, is comparable to how human relations have been treated in the political economic and political ecological analyses of environmental degradation (Bennett, 2005; Blaikie and Brookfield, 1987; Dessalegn, 1996; Mesfin, 1991, 1986; Susan and Nuttall, 2009).[144] As already suggested, in the case of farmers, the people-to-people relation could go wrong, among others, when there is lack of love and cooperation; when there is animosity, mistrust, adultery, mistreatment, false testimony and oppression among co-villagers. Therefore, as it is often assumed in the literature, farmers would not simply put the blame on nature or their Creator when a natural hazard befalls them. Rather, the principal difference between TEK and WSK in this regard is the ways the problems are understood and solutions sought. The difference between the two perspectives is not as wide as it may appear.

In addition to the need to repair human relations in order to repair severed human- environmental relations, a number of issues resonate in the myth. For

[142] Interview transcript
[143] Field notes
[144] These indicators are quite comparable to those employed by political ecologists as their focus on the issue of authority and power relation, oppression and unfair distribution of surplus produce in natural resource management among classes, countries and even continents.

instance, knowledge about the intensity of soil erosion due to the effect of rain splash, an effect understood by science, perhaps lately (Blaikie and Brookfield, 1987), is suggested in the myth as an old environmental knowledge. In tandem with this, it is implied that soil erosion is not only human-made but also natural, irrespective of (direct) human intervention, as mere intensity of rain could break the land and protective structures on it. This is comparable with the knowledge of many ecological scientists that the environment could degrade without the involvement of human intervention (e.g. Blaikie and Brookfield, 1987). This intensity, which could be taken to stand for the force of nature, could be beyond human capacity to control irrespective of their preemptive measures. In this regard, the myth is also about the limitation of human capabilities before natural forces.

Temporality also crops up in this myth. The sins of humans gradually pile up in the 'sea of sins' before rising up to form clouds whose rain shall overtake humans and their resources. In here, there is an element of understanding the insidious nature of environmental degradation (Cf. Blaikie and Brookfield, 1987). Another striking theme of the myth, I think, and also related to one of my major lines of arguments, is that conscious thoughts and activities are necessary but not sufficient to grasp and deal with the complexity of nature. Rappaport (1969) and Bateson (1972) hold "the linear structure of purposive, problem-solving consciousness is incapable of grasping the circular connectedness of living systems, and that explicit knowledge and rationality are insufficient tools for the sustainable management of ecological relations" (as cited in Hornborg 1996, p. 47). In the same manner, among several texts and artifacts in this research, the myth tells us that farmers' can have a false impression of rain as good which is rather destructive- eroding the soils, destroying the field crops and even sometimes, as it does, costing human and animal lives. This represents humans' potential ignorance in front of the complex and subtle works of nature as argued by Rappaport and Bateson. In this regard, the myth represents a knowing or sentient land and a not-all-the-

times-omniscient, if not ignorant, humans, yet equipped with their 'formidable', age-old and rich environmental knowledge and technology. Of course, for these farmers, the existence of omniscient and omnipotent humans in relation to the environment is an environmental nonsense. This inherent limitation on the part of humans, contrary to what the cornucopians believe, I contend, will last to the indefinite future of humanity. With this, I shall move on to the remaining texts (perhaps a second myth) of the myth as narrated by the same person.

It goes as follows:

> There is a sea called *baharäl nur* [sea of life/blessing]. It is the sea of the *wälliyyoč* [of the sheiks] and the *gäbäréwočč* [of the 'true' farmers]. It is different from the former. This is the rain that is useful to us; the usual pro-farmers *mäléika* [angel] loads it from this sea. There is a sign for you to know this rain; it won't fall during the day; but it falls in the night after all humans and animils have accomplished their activities during daylight and have entered home. Hours before dawn arrives, this rain is already gone. This rain comes when it is loaded from this sea by the good angel. The other arrives to punish us for our sin; it rains as we are plowing; it exposes our seeds to the birds, it disturbs life activities at the markets and everywhere. Every drop of rain that emerges from this sea [sea of life] drops down with an angel. The angels cause the seeds to germinate, the plants to grow, blossom and bear real fruits. They will remain on earth till a sawn seed is germinated and the crop is cut; then the angels will go back to where they came from. While in the field, the angels need to have a well sanitized field. As a result of this, we do not urinate or defecate in crop fields. We do not even enter our fields after chewing *çat* lest the angels will go away.[145] The fields rather need the *atäla,* the *käsïbulhalal*[146].[147]

This part of the myth rewards humans not only for their good human-to-human relations but also for their environmentally friendly behaviors. The typical sheiks are those who are dedicated to the service of God and then, by virtue of this, to humans as well. Through their supplication, it is believed,

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[146] This is a residual of the traditional home-made alcoholic beer called *t'älla* which has been in use on different economic, social and family occasions among these communities. Nowadays because of some religious sensitivity, there are villagers who have dropped its consumption. Such farmers do not let grow even the hope plant in the fields and gardens, whose leaves and stems are important ingredients in the making of this drink, for the same religious reason. They are not involved in its transportation, either.

[147] Interview transcript

they might withstand bad rains coming from the 'sea of sins'. They could also make rains during droughts even though it is widely regretted that such clear-hearted men are becoming quite rare nowadays. It is interesting to note that the term *gäbäré,* which refers to a farmer in standard Amharic, and is invoked in the myth, is symbolic and different to what is held by officials and scholars. For farmers, a *gäbäré* is not one who simply tills the land. He is one who cares for and protects the land and the livestock as well. He has good knowledge and the technical know-how required to deal with the land and crops grown on it. He is the one who craves for the scent of soils and is proud rather than ashamed of getting soiled. In technical parlance, this is the farmer that could be referred to as "environmentally friendly"[148] or a 'model farmer'. Therefore, such farmers (and not the 'lazy' ones who do not conserve their land) and the true sheiks are the ones good rains are sent to. At a higher level of abstraction, the myth could be taken to compare the 'sea of life' to 'a protected environment', which could guarantee the supplies humans need sustainably. On the contrary, in its earlier narrative, it could represent "a degraded environment" which could endanger their sustenance. Kates wrote "the environment as hazard is integral to the environment as nurture or resource; men encounter hazard in the search for the useful. The environment as hazard serves as a source of stimulation, and is rich in the mythical and the symbolic". (Kates, 1976, pp. 133-4) This is substantiated by these and many other cultural understandings of resources and their risks or hazards among these communities.

Overall, expressed in these mythical beliefs, apart from the ontology of 'good' and 'bad' rains, are agricultural benefits and risks of the environment at large. Rain, a resource of prime value to agriculture and the ecosystem in general, is also understood as a cause of their destruction. What is scientifically understood as resource mismanagement or maladaptive responses to environmental problems (Cf. Milton, 1996) is also comparably understood by

[148] The symbolic multivalence of the term *gäbäré* is more complex than this.

these semi- traditional farmers. Scientific knowledge explains the problem in terms of humans' relationship to the environment and their political organization thereof in addition to some bio-physical factors. Traditional knowledge emphasizes humans' relations among themselves and then with their Creator. Irrespective of the difference regarding how, the similarity between the two perceptual modes is that human agency could be both beneficial and degenerative to the natural environment in the agriculture-rain nexus.

Amidst these spiritual perceptions, scientific explanations about rains are scarce and scanty, save many young people who are better, primarily due to exposure to modern education. In this way, cool air rising from trees, lakes and oceans are mentioned as sources of rain. Even then, things are considered to be under the control of God in the final analysis, rather than taking science as an alternative source of knowledge. Scientific explanations entered local discourse as part of the extension of western influence into Gäddärro mostly in the 1970s. Mass media, schools, group media and agricultural extension still play important roles in this respect. Local knowledge on the origin of rain, nonetheless, is still largely spiritual. Scientific knowledge, in this regard, is not internalized even by those exposed to it. Most of the times, they made the remarks: "we hear them say this…we hear the radio say that" rather than ascertaining science. Therefore, there is a widespread lack of knowledge of the scientific explanation of rain, mostly among the older generations.

I want to finish this section with some discussion on gender and the symbolism of rain. In local terminologies, there are different varieties of rain based on their nature as well as economic and ecological values. For instance, a robust rain is said to permeate the land thoroughly, thus impregnating or fertilizing it. This type of rain, locally known as *korma zïnab* (sire rain), is an agriculturally productive rain. It causes the land to bring forth to the farmers the crops and vegetations needed to sustain their lives and their animals. To

the ecosystem, it lets the grasses sprout, the trees grow and all the other vegetation green. To the wild beasts and the rest of the non-human organisms, it equally bestows life and happiness. To the guest, as I was in the fall of 2007, it decorates the landscape and makes the person grin, as it does the insider.

The extension of sexual attributes to the relationship between rain and land permits more symbolic interpretations. It could be understood to mean that rain copulates with the land as men do with women, thus men symbolizing rain, and women, the land. Biologically, both women and men contribute to the birth of a baby but culturally and scientifically, women bear almost the entire course of pregnancy and delivery. Contrary to this, the cultural rights given to women over the person of their children in many societies are much lesser than that given to men- fathers. Through this symbolization, rain enjoys over the land the predominance men do over women. In a similar manner, rain's economic value has fallen short of being fully recognized like that of women's. However, both in state and community rhetoric, rains need to be conserved and women's contribution to society duly recognized. Helen has described the state channeling of modern services into rural Ethiopia as androgenic (1990, p. 147). In local and national discourses of gender, women are pictured as the most important elements of society so much so that rain is the most important element of the ecosystem. In both cases, behavior is a long way behind percept and this remains to be one of the formidable environmental challenges at local and national levels.

8.2.2 Local Typologies of Rain and Their Significance

There are different local typologies of rains depending on their agricultural, social and ecological significances. In addition to *korma zïnab*, discussed in the symbolic analyses of the above myth, a host of different local terminologies are applied to describe rains. These include: *léba zïnab, wašo zïnab; abbïl assïl zïnab, abbäy gännän zïnab* and *wïdïkïdïk zïnab.* These

terminologies, at first sight, might appear a mere linguistic play with the environment. A closer investigation, nonetheless, reveals that they are key-terms codifying local environmental knowledge based on decades of experience and observation. *Léba zïnab* (lit. thief rain) is one which falls unexpectedly and treats the field crops and the pasture in a well-balanced manner. Agriculturally, it is considered very beneficial as it does not cause soil erosion and flooding. Thus, it is most preferred by villagers such as Awraççа which has shallow top-soil. *Wašo zïnab* (lit. liar rain) is one that comes with a vigorous cloud but disperses after rowdy gusts of winds followed by infective showers, failing to deliver its expectation. This rain is not preferred by all standards. *Wïdïkïdïk zïnab* is unsteady rain which is intermittent as it falls and is quite inadequate for field crops and livestock pasture. *Abbäy gännän zïnab* is a sudden stormy torrential with the capacity of destroying field crops, breaking and driving away soil conservation structures and even livestock and human beings. This over-empowered rain, also mentioned in the myth discussed above, is experienced sometimes amidst the unreliable weather of the research area, perhaps as part of the global climatic extremities. Such rains were experienced during the *kïrämït* of 2007 while I was in the beginning of my fieldwork. This rain is considered to be beyond human potential to control its destructive effects fully. Aided by the high slope gradient and partly de-vegetated landscape and some wrongly made conservation structures, such a rain could devastate SWC structures. When it is mixed with hailstorms, its devastation is even serious. Therefore, agriculturally, its risk outweighs its benefit. It has also the least precipitation as most of it, falling slant and vigorous, is converted into floods. A farmer said that it does not have a lubricating effect (*märäk'*) for the soil. This rain is also called *näççˀ zïnab*, literally "white rain". Its social repercussion is also negative.

Abbïl assïl zïnab is that which is not too light and too heavy. It is one that allows more rainless days than wet in the agricultural season. Notwithstanding

local differences in agro-ecology, the villages studied generally prefer such a rain for farming. If it were in the good olden days, where there was less soil erosion and the vegetation cover was much better, such a rain could have been considered inadequate. Today, given the level of land degradation, farmers underscored that rains with lesser amount and intensity are much preferred. The capricious and less reliable nature of rain over the years is thus captured linguistically and through the extension of humanly attributes, including their impacts on soils, crops, livestock and vegetation. This is a form of projecting culture onto the environment (Cf. Crumley and Marquardt, 1990, p. 73, as cited in Balee 1998, p. 21).

Rain that causes no or less harm to the crops in the fields, to the livestock, to the soils and other components of the environment is conceived agriculturally (economically) most productive. This is a *bona fide* rain. The phrase *"märét yamaybäsa; t'ïğğa yamayakäsa": "that which does not break the land and does not waste the calves"* is made in reference to the ideal rain desired by farmers. The term, *yägäbäré zïnab*, meaning '*agricultural rain'*, is given to describe this type of rain. The direction and intensity of the wind are also important factors in the valuation of rain.

While local understanding of rain is primarily based on its agricultural significances; social, religious and ecological considerations are also involved. Agriculturally any rain that does not fulfill these good attributes is conceived, at best, less worthy and, at worst, destructive. Of course, even among communities of a micro-ecology like those of this research, the economic importance of rain is differently conceived because of ecological factors, mostly variations in soil and slope gradient. The district covered by this research demonstrates such an ecological diversity where just within short kilometers of distance diversified agro-ecologies are found. If we take farmers in mid-highland and highland villages and contrast them with those living in the lowlands, there is a drastic difference as regards the understanding of rain

in agricultural activities. (I will turn to the discussion of this issue in the section on drought). Therefore, because of these differences, farmers perceive different kinds of rains, most of which are well captured in their language as already discussed. (The different types and attributes of rains as conceived by farmers are summarized as Appendix 12).

Owing to these bio-physical differences, there is also difference in the level of crop production and productivity achieved. Generally speaking, according to local knowledge, the little Gäddärro area produces more followed by the Absaro area; the Mïsïräta area produces more than the Bultumo area, the one getting the least produce per a unit of land. In other words, the likelihood of production failure or productivity reduction increases as one descends from Little Gäddärro through Absaro and then Mïsïräta down the mountain to the Bultumo type villages. The Little Gäddärro type villages are also the ones that allocate proportionately more land to *bïllagi* crops, also being the ones harvesting more from this season. *Bïllagi* production decreases as one descends to the Bultumo type villages down the mountain massif because of reduced level of precipitation. Of course, in Wärabäïti, which is more marginal in moisture content, little is produced during this season. The quality of the grains is also said to be rich in the case of the Little Gäddärro type villages. Even when the grains are measured, the Gäddärro types are said to carry more weight. Due to these reasons, the level to which these communities benefit from the same level of rain is divergent. Again, as shall be discussed in the section below (on drought), their exposure to drought and famine differs, even when all might be affected ultimately by notorious droughts and famines as in the 1973-4 and 1984-5. The Little Gäddärro type villages are the ones to succumb last.

Local differences in valuing rains have another dimension. Those who have planted sorghum might need rain at a certain stage of its growth whereas those who grow wheat or teff might not. What is more, even within a given spatial

unit, the importance farmers attach to rain differs based on their specific plot or crop characteristics. As Chapter Six has discussed land forms, the access of households to plots in different landscapes affects their capacity to utilize the benefits and cope up with the risks and problems of rain. These risks are also compromised by land fragmentation which is otherwise considered a liability. Rain that has negatively affected the crops might have some benefits to those who accidentally rear (or keep) large number of animals as the grasses and other vegetations would sprout after rains not desired for crops. For instance, undesired rain during December is problematised largely in relation to crop damage in the experts' perspective. Further to this, farmers underlined that, livestock, especially fattened ones, will be emaciated significantly. One of the potential consequences of this is forced sale of fattened animals at depressed prices. (Detailed local perceptions of the timing of rain and their agricultural merits and demerits are presented in a matrix as Appendix 13).

It is important to note that local residents recall that a farmer called Indris Musa from Šola Gända once remarked, *"Hat'ät'in gama tibälaw näw ïnén yämigätmäñ": "I will have the best of my harvest when Hat'ät'i is stricken by drought"*.[149] Local interpretation of what this farmer said is direct and representative. The place known as Hat'ät'i, found in Wärrä Ruga, is known for its marginally poor land or leached soil and hence low agricultural potential. Largely, it produces, as it did in the past, red sorghum, peas, lentils and haricot beans, most of which are poor soil-loving crops. Only occasionally are *yämrïk' ïhïl* (awn crops) such as wheat that require better quality soil grown. Therefore, when Hat'ät'i and other places like it in soil fertility suffer from lack of rain or moisture, Šola Gända and similar villages reap ample harvest and vice versa - more sunshine helps to evapotranspire the water that otherwise could have logged reducing crop yield. Hence, Šola Gända and its like villages are not affected by moderately prolonged dry periods, say, as Mïsïräta or Awraççа are, including Hat'ät'i. During the 1973-

[149] Field notes

4 drought, the crops in the fields in Šola Gända and some other villages such as K'és Gända were greening while the rest were drying[150].

Rain is an important defining factor of the life of rural societies. This is highlighted by the twin-phrase *"täfät'ïro käsät't'än" – "täfät'ïro käk'ärräbïn":* "*if nature gives us"* versus "*if nature forbids us".* In the first case, which is to mean when there is good rain, it means farmers are in agreement with the ecosystem or nature and there is everything at their disposal. On the contrary, in the second case, where there is no rain or there is bad rain, they are at loggerheads with nature, and they could become virtually empty handed. At such a bad moment, their livestock could starve from lack of forage and water. They fetch fewer prices on the market, if at all. And eventually they could die. The wild beasts shall suffer much. The dead shall not find their spiritual food from the land they once possessed and nurtured through hard work and sacrifices. Therefore, when nature forbids, it is a cause of concern and disturbance because there could ultimately be drought and its uncompromising offspring, famine. This will be a moment of chaos *(k'äwt'i).* Since the 1973-74 'drought-induced famine', it has become the tradition for Gäddäroans to seek from the hands of the state (actually from the hands of the international aid, relief and donor communities) in lieu of the hands of nature that is rain. The dependence on state partly emanates from the traditional attitude that regards the state as a symbol of affluence and source of inexhaustible resources.

The details and complexities of local understandings of rain as an agricultural resource reveal the shortcomings of the universalizing official and scientific understanding. Notwithstanding that droughts have increased over the years among these communities, the rest of Ethiopia and other Northeast African

[150] Those who survived the famine remember lowlanders begging for green maize stocks in the desperate search for something food as they were migrating up to the district seat, Bistima, expecting government support and some casual employment.

countries, considering the environmental history of Gäddärro, we learn that climate change is excessively demonized as an environmental calamity. It should be noted that local knowledge of the intricate mystery of nature fares better in some respects than the official and scientific perspectives. There seems to be an invisible hand at work which is secretly striking some kind of balance among the changes experienced by the different components of nature or the environment at large. Deforestation, over-cultivation and the other conditions that have contributed towards worn out lands, eroded and exhausted soils, are naturally counterbalanced by decreasing amount and intensity of rain over the years. Thus, the land has somehow naturally adjusted itself to reduced rain and precipitation. My most elderly research partners repeatedly said it would have been irredeemable land and soil loss if the long-sustained, heavy and torrential rains of the past were to come today. Thus, it is interesting to note that while drought is widely regarded as one cause of crop failure, today, farmers thank their Creator for keeping those old rains away from them. Contrary to this, in the official and scientific parlance, the image of the old rains is wrongly invoked as something necessary to boost agricultural production. This is excessively charging an officially and scientifically constructed negative meaning on climatic change to which both human-kind and nature had contributed. Paradoxically, however, as it is mentioned already, smallholders complain about bad rain more than they do about drought. If not only for lack of proper accounting, food shortage to be incurred from bad rains is probably more than that caused by reduced precipitation or drought. (The monthly rainfall distribution in mm for Wärräbabbo district from 1988-2005 is presented as appendix 14)

8.2.3 The Shift in Understanding Rain

New waves of ideas radiating into the rural communities through state agency challenge the old views and values. New ideas see rain as a scarce agricultural input meriting economic, wiser and more conscious management. Scarcity of

rain as resource constraint is likely to have an impact in this perceptual transition. What a farmer once remarked is worth noting here, "You cannot call poor he who has irrigable water even as small as the urine of an ox".[151] Even though there seems to be a long way to be covered before satisfactory perceptual and behavioral shifts are achieved and even if still farmers worry for their soils lost and not water, knowledge about the value of water as a scarce agricultural resource is improving gradually. Government-induced water harvesting as a response to drought and effective management of precipitation has some positive effect in this regard. The problem is that even good level of awareness does not necessarily result in the desired behavioral change- a perennial theoretical and operational challenge of the percept-practice nexus.

8.3 Understanding Drought

8.3.1 Explaining and Interpreting Drought

As for bad rains, religion is the primary factor on the basis of which drought is explained. Not having rain, not being able to plant or plant properly, not being able to find forage for the animals, reduced yield, drying vegetation, lack or scarcity of water and finally not getting food for humans are the challenges that crop up in farmers' minds thinking of drought. Ebro Çoré, a farmer from K'ädida, remarked, "Drought kills everything, humans, livestock and trees".[152] Another farmer, Ahmäd Hamidé, from the same village, added, "Our Book [the Quran] says during drought the earth itself will die leave alone those with soul. But when it rains, the earth will awaken again, everything on it will sprout. Drought is a danger to everybody, everything".[153] A more inclusive definition of drought both as a natural hazard and a human problem was given by Tasäw Mäkuria, in this same men's group discussion,

[151] Field notes
[152] Field notes
[153] Field notes

Regarding drought, they [the group] have already said even the earth dies. It is true that she dies. Grasses do not sprout, trees will get dry, and development work shall be stopped. This is real death; just it is the soil that does not disappear; if everything on it is destroyed, what more severe disaster is there to be called death. When we are dead, we are also entered into the earth. But when it rains, weeds come forth; animals will get feed to thrive again. The problem of drought is now getting stronger from year to year.[154]

Local meaning of drought has evolved over the years. Today, they have a more diverse meaning of drought and of course rain, as discussed in the preceding section. Let us take a longer representative excerpt from one of the group discussions I had with men in Awraççа. Muhé Ğarso, said:

The land of course can forbid due to natural reasons, if it does not find its food, which is rain. Then our crops will dry; this is imbalance in the weather. Of course, if rain is not there in one region, there could be in another. Complete failure is unusual. In 77 [1984/5], we were displaced because of drought and famine. Some survived here; there was rain in 78 [1985/6] everything regenerated, the plants, the people, the animals. Since then, we do not have natural problems and the land is giving back what we give to her. During drought the crops will die, but …I say the land will not stop its *abbäl* [return, offering]. It could only reshuffle the planting and the harvesting seasons as we have seen it in our generation and as we have heard it from our ancestors. It will rain. As the rain falls in this reshuffled manner, the lands that were not cultivated will sprout grasses. That will be the feed to all animals around. In that same 1977 [E.C.] year cows gave birth to calves and then we were able to drink milk. The pack animals were fed wherever some feed was available and we used them to buy our grains from other places. All the goats were breeding after the grasses sprouted. We were also able to eat meat; hence, I would say the blessing of the earth will not stop. Even during that serious drought there used to be something to be eaten though very meager and to cook that we were depending on land for fuel wood which she offered to us. Again, even during that drought moment we used the roots and berries available and we got that because the land was there, even the *ak'änçïra* [a preferred weed for animals].[155]

Further, the same farmer related his experience that even though relief assistances were to come, the land never failed totally. This text also reveals how drought is less demonized by smallholders compared to the official view, as it is already made note of in this chapter. It also relates to the "we are the world" type of perception mentioned in Chapter Six. It goes as:

Even though the relief foods were not to come here and we were to perish, we cannot say land has stopped its *alaba* [return or offering]. I planted maize on a *wuha gäbb*

[154] Interview transcript
[155] Interview transcript

[irrigable] land on sharecrop because he [the land owner] did not have oxen, he sold them. Then, I was able to harvest quite a lot in that serious drought. If the food was not available on other parts of the world, where else could the government get it? The role of the government is also very helpful; otherwise we could have perished. The resettlement itself has been somehow useful in this regard, including the relief package in it. Many people have gone to the resettlement area from this *got'* [village]. Of course, many relatives of ours have died after establishing there. Even then, the government resettled the people on land, on earth [where else, then?], the land is mother; a mother does not hate her child.[156]

In their representation of past droughts and "drought-induced" famines, my informants also painted the image of oases amidst a dessert in reference to such places as in Absaro, where one always found green spots. As a result, a new form of defining drought, alien to the local, the state and scientific perspective(s) is developing among these farmers in the face of the ups and downs of nature.

Living with drought in Gäddärro has also become a matter of tolerating it, in addition to striving to cope with its challenges. During the drought of the *bïllagi* of 2008, some people were in praise of the drought itself. It was said the hunger was fine except that it was a little bit tough for the time. My key informant, Bäkär Sämman, from Awrraça, remarked,

Had we eaten our fill, there would have been many things we do and we wish to do. It weakened us, including the powerful, so that we all are praying to God just thinking about our soul, our survival. He [the strong person] forgot thinking of injuring others; he forgot thinking of competing with others and rising above them. He just thinks of surviving with his family, submitting to God.[157]

This person was making the remark as the next main rains were started and were doing well after faltering in the beginning. His interpretation was that because of their submission to God during the *bïllagi* drought, they were being rewarded by good rains during the next *kïrämït.* In this regard, he added,

Because of that [their submission to God] the rain we are having now does not have *gurïmïrïmmta* [thunder]; we are not scared of *çärärta* [lightening]; our soils are not washed away. Otherwise, a day's rain could have destroyed the *kïrrït* [the bunds]; it is not for our maintenance work. God has a pity on us….God is rewarding us in this

[156] Interview transcript
[157] Interview transcript

manner because our *adäb* [manner, calmness and control] is fine now. It [drought] originates from our own deeds.[158]

The text converts environmental challenges into environmental opportunities, albeit in a religious term. For those who wish to apply this lesson practically, it will definitely be an interesting input to the current environmental quest.

Actually, crops, especially awn crops, did remarkably very well during that *kïrämït* but wrongly timed rain during November and December (as they were approaching harvest) was a serious challenge. In Gäddärro, farmers did their best to preempt this rain (which had a national character) by cutting and drying crops in all possible protective places, including the home. In terms of quantity, the reduction was not felt, even by those who had some of their crops germinate on their head, standing out in the fields. It was said the crops really did exceptionally well. The quality of the food was however poor because the grains were socked and dumpy. Such crops also fetched lesser price in the market. At home, porridge and pancakes made of these crops were rather sticky and uninviting until the women invented shortly a culinary skill to do away with the problem.

If it were not for the untimely rains, the rains of that *kïrämït* were smaller compared to that of 2007 and 2009. According to local explanation, the exceptionally high crop performance was not resulting merely from ambient rains. The *bïllagi* drought that preceded it had its contribution as it decomposed the bioms and enriched the soils. This was its hidden benefit-perhaps its paradox. Elderly informants recalled this was the case regarding all harvests that followed a dry season or drought in their history. Therefore, quite ironically, drought befalls these people with some element of the coping mechanism as well, albeit in its wake. For farmers, this is an environmental experience, a *direct perception or perceptual engagement*, to borrow Ingold's terminologies (2000), amidst their religious explanations and interpretations of drought.

[158] Interview transcript

This experience has remained quite invisible from the sight of officials, experts and scholars alike. On the part of farmers, however, it is one of the factors that encourage them to live with drought positively. Of course, the untimely rains of the *kïrämït* of 2008 were also a blessing in disguise in another way. Grasses and green vegetation that could have dried in the following months, according to the normal calendar, re-vegetated very well. The image of the dearth of forage that was experienced in the past *bïllagi* drought during the same time was completely reversed into one of excess forage supply-indeed, extravagance. In view of this, the untimely rain might have been more useful than it was destructive. This shows nature going its own way in a complex, connected and subtle manner as stipulated by political ecologists and scholars on TEK (e.g. Berkes, 1999; Kottak, 2006; Susan and Nuttall, 2009) in the composite theoretical perspective of this research. It remains for humans to read nature's contours and follow them, if it is not possible to modify them -farmers could do better for the most part, in this regard. On the contrary, science and policy seem to be quite far removed from this. Work is in order to enhance culture to follow nature's course rather than humans having nature fit their cultures. Of course, most of the technologies that have been implemented so far could be assessed in this light, rainwater harvesting being a typical example.

The religious interpretation of hazards is not limited to drought or excess or untimely rain. It cuts across every aspect of human existence in Gäddärro, especially amongst the older generations. Writing on the significance of this aspect about farmers in north and central Ethiopia, Mesfin remarked, "Any attempt to displace God will not only be futile but will even tend to make peasants close their minds to elementary scientific knowledge about the forces of nature. It will perhaps take generations to teach science without God". (Mesfin, 1991, p. 38) He continues, "The real significance of this peasant perception is that no person or institution is responsible for drought. It is a deliberate act of God alone and, therefore; no person or institution can be held

responsible for the consequences that follow from it". (Mesfin, 1991, p. 38) Notwithstanding this observation, looking at the situation from another angle might give a slightly different picture. In the discussions and interviews I had with smallhoders over the course of 13 months of fieldwork, I heard no one complaining about bad policy or lack of good governance in relation to drought in quite a direct sense. It is true that they complained that the feudal system was oppressive but also appreciated the redistributive role of its oppressors. Local overlords, who financed collective prayers, including those made to plead God for rains, were so positively remembered by survivors of the past. Some regretted that today's men of authority lacked those kinds of hearts though are appreciated in another way- international relief food aid. As already noted, a problem in the social relationship of villagers could put them in a problematic relationship with God, causing drought among many other disasters. The problem with this conception is that it remains to be a mere theory. Therefore, as Mesfin was saying, this attitude continues to insulate governments from being responsible for their bad policies or lack of good governance (Mesfin, 1991) and perhaps the international relief aid community as well.

Governments, NGOs and donors conceive of total failure of rain or its scarcity as causes of food shortage, hunger and famine. For lack or scarcity of rain to be called drought, a mandatory requirement is a human presence in the environment thus affected. Taking just the case of smallholders, my interest in this research, drought affects them not only because of its nature but also because of their inability to cope fully with its natural patterning in their economic exploitation of its counterpart, rain, and of course, drought itself. In this regard, I contend, as my Gäddärro educators do, drought should be seen as an important agricultural necessity as rain, if not more. This is one of the lessons to be drawn from a processual and interactive ecological anthropology of the time. While generally rainfall patterns and intensities are told to be unreliable mostly since the 1974, oral history has it that in no period had the

rains been completely absent for more than one year. As already remarked, past and contemporary evidences of production volumes from farmers' qualitative information show that the highest ever amounts of harvests in history were collected following every drought that had occurred. The *bïllagi* of 2008 is a recent testimony. From what local informants had to recount, it gave the impression that no local or imported agricultural experimentation or innovation had ever resulted in such bumper harvests. Hence, farmers evince a less demonized image of drought (or moisture stress) than governments, policymakers, NGOs and scholars. Indeed, it might come as a surprise, to hear them say, the ambient environment for their agriculture is, "one-fold of rain for every two-fold of sunshine". Prolonged sunshine is more preferred by villages with shallower top-soils such as Awraççа.

As a result of this same reasoning, when farmers fall into shortage of food or hunger amidst or following drought, it is appropriate to think that had they had enough fallback stock or money, they would not have been affected by these problems. A political ecology of drought, thus, renders the political system responsible for turning the natural hazard, drought, into a social problem, food shortage or famine. A philosophically oriented approach, as already said, might even question if it had to rain following the usual rhythms we call seasons. The seasons are changing currently even within the life span of one person. Therefore, if it does not sound excess, we might even pose such questions as the following: is it natural for it to rain following the 'traditional' pattern it did? Or, is it the season that should fit the farmers, or the farmers that should fit the season? In this regard, the cultural construction of natural or environmental resources has made the seasons and agricultural cycles appear more natural than nature in the pursuit of agriculture. The condition of the majority of these smallholders experiencing food shortage after every crop failure from drought or other natural hazards had been more of sociopolitical, rather than natural. This is substantiated by the experience of some better resourced households who safely and luxuriously pass the tide, whereas the

majority had to face its brunt, if not falling to the mercy of relief food aid.[159] At the empirical level, the question, why do actually the majority fail to do so shall take us to a number of internal factors that have to do with each and every farming household and external factors of government policies and ideologies as well as the unholy effects of global economic, trade and political organization, including international relief cooperation. The philosophical questions raised above need to be addressed in order to improve our knowledge at the theoretical level and widen the empirical scope for solution such as irrigation which Bayner described as "early human attempts to domesticate climatic variability by regulating the irregular occurrence of rainfall, flood, or snowmelt for agriculture" (Bayner, 2003, p. 280) .

Economically, lack of money from years preceding a drought year is a culprit, especially during the 1973-4 famine. In the local price history of Wärräbabbo, the time was remembered as one of the years in which prices for crops had significantly dropped, even in the height of the famine. In the local Hamusit market, in the small countryside of Goha just about three kilometers away from the villages I studied, five kilo grams of cereals were sold for one Birr. Unfortunately, most of the farming households were financially broken to purchase them. Their less drought-affected livestock fetched the lowest prices in the market rather than boosting their purchasing power as they did during normal times. In most of the cases, it was reported that farmers did not find at all market for their livestock. Another rude aspect of this history was that

[159] This should not give the impression that I am against international cooperation that enables the transfer of resources from rich to poor countries in order to deliver humans from suffering and death, whichever ways the causes of the problem are explained. All the same, I cast some doubt on the genuineness of those who do not become at least a little bit doubtful of this international cooperation which has contributed very little to help eject peoples from cycles of food insecurity, poverty and famine in this country and the rest of the world, after huge relief (and of course development) resources have been injected for nearly half a century. I hold with Mesfin Wolde Mariam who once wrote that NGOs (I apply this term to refer to the donor community as well) have been dealing with the proximate causes of the problem of drought in Ethiopia rather than its root causes (1991). The case is that relief aid has been preparing people for more relief aid. I am nonetheless quite aware that international relief aid has saved human lives and reduced their undue suffering even though many more could have been saved had there been better accountability and coordination.

amidst the flaming hunger, several truck loads of grain crops were reportedly transported into other provinces from the provincial town, Dessie. Commenting at country level, John Holmberg, noted,

> Even during the height of the drought of 1973 when thousands of people were dying from hunger there was no shortage of food grains in Addis Ababa or other major urban areas. Retail prices did rise by about 20% in 1973 and continued to rise at an even faster rate in the first quarter of 1974. However, official trade statistics show a net export surplus for cereals, oilseeds and pulses of 203,900 MT in 1973, the largest export surplus in any year since 1962. (1976, p. 4)

In writing this, the primary objective of this writer was to show how the marketing system, though 90% of the grains were handled through private channels (Holmberg 1976, p. 4), was inefficient in channeling supplies from surplus-producing into food deficit areas. In the same manner, another writer, Sisay Asefa, emphasizing poverty and lack of farmers' purchasing power, wrote,

> This was the case, for example, during the Ethiopian famine of 1972-1974 in Wollo region, which resulted in the death of 200,000 peoples. Massive starvation took place because farmers and herders were unable to purchase food from southern and central Ethiopia, where production was quite adequate during this period. The lack of purchasing power combined with the central government's failure to transfer food from other areas resulted in what some social scientists have called 'Entitlement Failure'. This leads us to conclude that famine most often is a direct result of poverty rather than of decrease in national food production. (Sisay, 1987, p. 15)

This analysis also goes with that of other scholars focusing on the political side of poverty, natural resource allocation and use (e.g. Mesfin, 1986; Kottak, 2006).

Starved farmers referred to by these quotations were not able to buy grain crops produced even within their own regions leave alone those coming from others. In a sense of self-composure and discipline, many people as in Gäddärro might have accepted their deaths in front of foods to be pillaged or plundered. Some of my informants survived this deadly famine thanks to the then temporary feeding centers and food rationing by international NGOs established at Bistima and Bulbulo areas. Narrating their plights, survivors

regretted that many of their children and relatives were sent to their untimely deaths simply because such assistances did not reach them in time. The tragedy of the 1984-5 famine, believed to have killed from one to 1.5 million people, was so worse but the same local explanations that exonerated the state were continued.

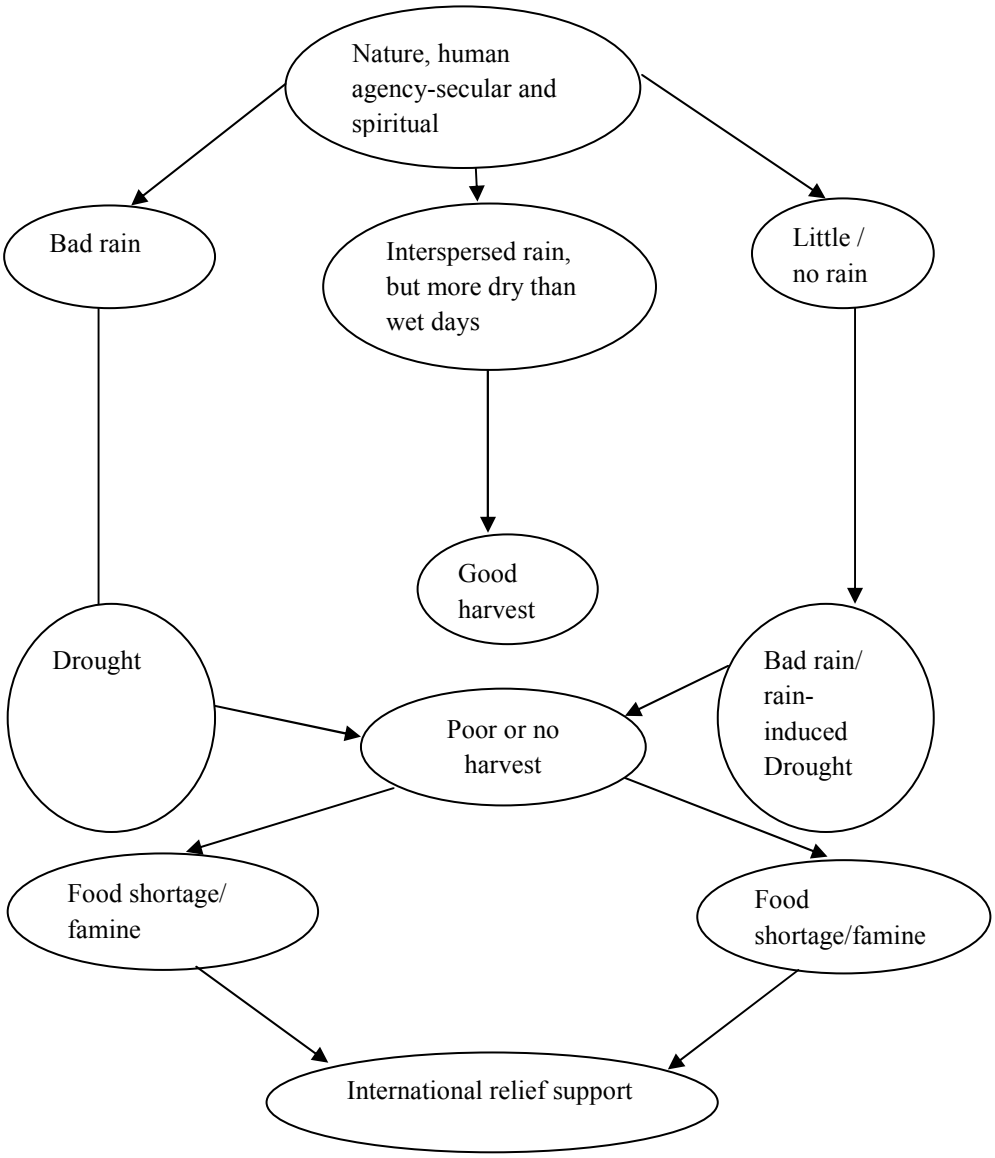
More often than not, such accounts as quoted above are clouded by the official ideological hegemony that ecological imbalance namely, drought, was the main reason to blame. Rather, lack of state responsibility in disaster preparedness and effective and efficient management of their negative consequences has never surfaced within the life time of an incumbent state. The exception is when a state is lost into the thin air, usually in political turmoil, and the nascent institution points its figures at the defunct regime. I want to repeat what I already said: many farming households where land is in relatively good supply could trek on a year's harvest for two or three years provided that there are favorable rains, good managerial support and judicious use of the produces. As Mesfin argued, the transformation into famine of drought gets most of its energy from the faulty workmanship of humans rather than from natural climatic factors (1986). Dag Hareide, who gave an 800,000 death toll for the 1983-85 Ethiopian famine, probably the smallest figure in the literature, had the following to say about the problem of getting international assistance.

> The last famine broke out late in 1983. But it was only in late 1985 and 1986 that Ethiopia, with international aid, was able to feed all the 7 million people in need of relief food. This proved that the famine could have been avoided if the intervention had been in time and adequate in quantity. This fact shames everybody involved. The responsibility rests first and foremost with the Ethiopian government. The first and most important task for any government is surely to secure food for its population through normal production and distribution, and to ensure it has the capacity to prevent a food shortage from developing into a food famine. (1990, pp. 199-200)

Survivors of this and the 1973-4 famine regret that there was delay in the assistance they were given and inadequacy in the beginning. Once relief food and other commodities reached, however, some survivors remember using

them profusely, and of course, in some cases, quite extravagantly, including trading in famine resources meant to save lives and dignity of human beings. As far as the responsibility of feeding the citizenry of a country is concerned, it was a cultural failure not only for government but also for Gäddäroans and Ethiopians at large who were unable to fend for their provisioning by themselves. Many political ecologists of this bent rather accuse the institution of government as the first-rate culprit (e.g. Dessalegn, 1996; Hareide, 1990; Mesfin, 1986).

Figure 5: Schematic representation of bad rain and drought as proximate causes of good and bad harvest



This schematic representation of the causation of drought, production decrease or failure and ensuing food shortage/famine, misses variations in cultural standards and agronomic practices of farming and differences in micro-ecologies among villages. It also misses the capacities of individual farming households to absorb such 'natural' shocks through different strategies as the use of previous stocks and purchase of grains. The scheme is better

understood as an immediate perception of both the popular and official models which regard climate as a significant factor of agricultural success or failure.

As mentioned of rain, local scientific explanation of drought is generally rudimentary. The clearing of forests was mentioned as one reason. Now that the forest converge is improving, there are some farmers who think that the condition of rains is improving a little. In this regard, the 1984-5 drought is also explained partly by the indiscriminate tree clearance made to preempt the then impending 1976 E.C. land re-distribution, including its God-saddening effects of unfair treatment. This explanation has some political ecological implication and renders the state or the institution of power transition as a cause of deforestation. Notwithstanding this, the criticism will also fire back onto farmers themselves who are otherwise largely depicted as innocent sufferers in the literature of climate change and land degradation in Ethiopia (e.g. Dessalegn, 1996; Mesfin, 1986).

8.3.2 Micro-ecological Variations and the Semantics of Drought

The experience of failed rains during the *bïllagi* of 2008 could serve as an example of the risks involved in drought or rainfall uncertainties. The first rain of the season fell on *Tärr* 10 (Jan. 19). Most of the farmers were waiting for more rain to start planting. A few farmers started planting on *Tärr* 11 (Jan. 20) and many joined them and accomplished planting until Tärr 14 (Jan. 23) without having additional rain. *Tärr* 11 and 12 were their busiest days, one of *ahïyya t'ïmäd*[160], as it is locally called. These farmers were the ones who were more or less to benefit from the one-day rain. The rest were waiting for it to

[160] This literally means 'get the donkey into the yoke'. It expresses the busiest moments farmers had to race with time in order to race with nature that is to complete planting before the proper time is gone. Out of this haste it is believed a farmer who does not have oxen would plow by donkeys which are not normally used as source of traction power.

repeat while they were also waiting for the *k'ïrn*[161] to leave. All farmers in Mïsïräta covered their fields with wheat seeds until Tärr 15.

In the case of Awraççą, the majority of people also planted wheat without waiting for additional rains. In Šola Gända as well, the majority of them planted wheat, barley, teff, and some oats during these days. As wheat grains do not favor too much wet or muddy soil during planting, most of the farmers in this village planted wheat on the *nïšš* (residual moisture) of what rained before. Barley and oats, on the contrary, favor wet and muddy land during seeding. Therefore, their planting was delayed until there was more rain. The rest of the farmers within these villages did not seed their fields because there was no more rain for the entire month. Though most of the land meant for *bïllagi* cultivation was covered with seeds, land meant for barley and oats remained without being planted. Had it rained again on *Tärr* 15 as it did 'usually', it was said, these crops could have been also planted. Farmers said the maximum amount of rain ever desired during the month of *Tärr* was just a three-day 'good' rain. And it is highly preferred if these rains did in wider intervals rather than come in line. If it rained continuously, it is said, the fields will develop more weeds[162]; the stalks of the crops will be slender and longer; and the plants will not bring forth big robust grains/heads. This explanation could partly be an attempt to exonerate the self, from weeding *bïllagi* crops save teff.

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[161] This is a miasmic smoke emitting from land when it receives rain after a prolonged heat or when it is plowed before deep precipitation is achieved. From their experience, farmers tell that this effect, which begins as soon as the rain starts, is more severe especially on land with more humus content. Inhaling this smoke is said to be medically dangerous, sometimes becoming deadly, both to humans and animals. Hence, the custom is not to start plowing until there is enough precipitation to prevent this problem and not to free graze livestock for the same reason. Nowadays, the capricious nature of the climate, especially the timing of the rain, is forcing some farmers to plant as it rained in the face of the *k'ïrïn* risk. However, they could still plow either early in the morning, in the evening or when it is cloudy because the effect of the *k'ïrïn* is minimal during these times of the day. The same precaution applies with the making and use of composts and this is in line with expert's advice, rendering the issue of *k'ïrïn* scientific but known to farmers perhaps before science. Experts say the soils release the chemical methane which could be deadly both to humans and animals if inhaled.

[162] *Billagi* fields are not normally weeded since the crops outgrow the weeds because of lesser rain compared to the main wet season where the weeds also develop necessitating weeding.

Bïllagi rains normally come during *Tärr* (January) and *hulätt wär gïmïša*[163] (February and March). In this case of 2008, once the first rain fell on 10 *Tärr* (Jan. 19), the second came on 1 *Miazia* (April 9), after more than two months of dry spell. Moreover, complicating things further, when it arrived, the amount was not satisfactory. Little Gäddärro, including Šola Gända, owing to their deep topsoil with better moisture retention capacity, planted red sorghum in advance of the second rain in a process called *mant'äf*[164]. Mïsïräta and Awraççа, which have shallow topsoil with lesser moisture retention capacity, planted their red sorghum after the second rain during 5-8 *Miazia* (13-16 April). These two villages planted maize from 15-20 *Miazia* (23-28 April). Many farmers in Binné were insistent in their expectation that the rain shall repeat and as it did not, *bïllagi* planting time passed before they seeded their fields. Instead, they planted red sorghum together with Mïsïräta and Awraççа, including the land that would have been planted otherwise during the lost *bïllagi*.

Overall, during this time, villagers identified six major conditions that created the difference in getting some harvest and not getting it for each farmer. *First,* the first rain on thick *walka* land did not precipitate well because of the nature of the soil (inadequate rain). Therefore, *bïllagi* crops sown on it could not develop deeper roots after germination and had to die out at tender ages. Following this, some of the farmers grazed their crops whereas the others cut or uprooted and fed them to livestock. It was said, such farmers contrived forage *(männo)* out of their destroyed young crops. *Second,* fields with deep yet *läm* or *sété* (course textured or 'female soil') soils were able to have

[163] It might be interesting to note that, *prima facie*, for farmers the months in the year are 11and not 12/13. In their recitation of these months they jumble February and January into one description, "two-months of land preparation". The formal calendar of Ethiopia has 13 months, the last being K'uagumé, with five days normally but becoming six once every five years.

[164] This term refers to a hopeful planting even though as we have already said every act of farming is hopeful and contingent on many aspects of nature. In this process, rather than waiting and letting pass the proper planting time, those who have more land that also retain better moisture might decide to cover their fields with crops. It is like a half- hearted attempt.

infiltration from the rain easily. Crops on these fields were somehow able to survive the drought and when the rains fell in *Miazia* (April), they were able to fill grains. Those who were able to protect their crops from the attack of birds intensively were able to collect some harvests. *Third,* farmers who prepared and softened their land very well before planting and planted their fields as soon as it rained, and who constantly kept the birds off, were, irrespective of which village, also able to collect some harvest. *Fourth,* farmers who did not prepare their land properly, who did not plant as soon as it rained and, who, out of despair, grazed their planted fields or used them as forage, were left without any harvest. *Fifth,* those who had fields that could easily take and retain moisture were also able to get some harvest. These were those having such land as *zäbt'*[165]that is low lying land. Those who planted on poor, leached soils *(k'oda or gaga märét* that is - *skinny or "wax"* land) had to experience complete failure. *Sixth,* fields exposed to *gama* (hot current of wind) were unable to get sufficient cool aeration, leaving their owners without result.

Young men I talked to from Mïsïräta and Awraççça said those who lost hope in the performance of their field crops and grazed or made forage out of them did for two reasons. They reiterated the adults that some of them lacked patience while the others had severe land shortage. It was said that the latter were worried that unless they overturned their poorly performing *bïllagi* crops and prepared the land for the coming major planting in *kïrämït* (mid June through mid August*)*, they were going to risk two harvests. On the other hand, farmers with better size of land had spare fields for the *Miazia* and *kïrämït* crops and were more tolerant with their *bïllagi* crops to see their end, meaning to bear the risk. They constituted the majority of those who were able to collect some harvest at the end of the season.

[165] This is a depression or land with a convex topography receiving eroded materials from other landscapes but retaining everything on it. This is land that does not give credit to other land in the language of farmers. It always takes credit soils but will not pay back or give credit soils either to others. There is more on this and other forms of land in Chapter Six.

The experiences of that *bïllagi* drought are epitomes of how farmers struggled with nature. Apart from micro-ecology, household land holding and economy, their age-old TEK and practices were challenged by local climate change. Traditionally, planting was never an issue for individual contemplation and risk taking game with nature, dividing farming households along different decision lines. For instance, the threat of *k'ïrïn* effect was normally observed by most of the farmers. Nowadays, however, agricultural decision is being rendered more of a risky game, some kind of gambling with nature, in the face of which the relevance of local knowledge is also challenged. Scientific knowledge and technology had limited impacts to fill the gap in this regard. Idiosyncratic knowledge is cropping up instead.

The households that had been so differently affected by the same natural incidence inhabit agro-ecologies otherwise considered to be same. Of course, leave alone contiguous, socially interacting villages such as these, the agro-ecology classification of the country treats as similar micro-ecologies falling in different zones and regions. Therefore, it might be naïve to expect experts to treat these villages as different agro-ecologies. Local agricultural extension agents might act in this line but this is contingent on their personal propensity, which might not be greeted with enthusiasm from higher level officials who work on the basis of the broader agro-ecologies. Even though my analysis has not gone far to the extent of seeing how these micro-ecological differences affected the agricultural performance of individual farming households, and their social placement and interaction within their communities, it could be expected that this is the case. Hence, even in relatively similar areas the one-size-fits-all attitude is not that helpful. What is needed here is a household/plot-based approach in agricultural extension and education.

What is more, not only is the micro-ecology affecting households socioeconomically but also their socio-economy is affecting the ways they deal with their micro-ecology and hence the impact of drought itself. The

emphasis of writers such as Blaikie and Brookfield (1987), who treat land degradation as a social problem, is also revealed here at local level. Size of land holding; quality of soil; land form of land holding (which are historical, coincidental and at the same time political as in when land was redistributed in 1976 E.C.) affect economic and social standing of individual farming households as they do affect their agricultural decisions. What was not reflected by my informants but what I have sensed from my living among them is that households with better economic standing and those having access to additional source of income, such as remittances, especially from migrant family members abroad, are better positioned to absorb the shock of drought.

So far, these local variations and coping dynamics are not grasped by the official perspectives. Modern science and technology, a resource the state is dependent on, in its perception of agricultural resources and constraints, and how these resources should be managed, has not yet taken note of these local experiential dynamics of drought and their impacts and coping strategies. It is not that western science lacks the knowledge to pick such local variations; it can serve the purpose if applied. The issue is that when it is technically implemented on the ground, there is a failure of tuning it to local ecological variations and dynamics. Therefore, it could be said that the two models exhibit disparities in how drought affects agricultural performance at local level and how individual farming households cope or lose.

It has been noted earlier in this writing that a universally constitutive definition of drought is very difficult. Based on a largely quantitative survey, Mesfin concludes that for most of the peasants less rain, wrongly timed rain and no rain are all finally tantamount to no rain, satisfying their definition of drought (1991, p. 37). My findings are corroborative of such a conclusion, even though farmers' understanding of drought is rather elaborate and dynamic. Indeed, I have already discussed that farmers' agricultural behaviors

are less affected by drought than it is generally believed. Some of the important agricultural activities like seedbed preparation and planting are done well before it is time to fully declare that there is drought. Many farmers carry out whatever is best to grapple with residual precipitation or small shower before falling in drought's grip.

In this process, farmers' meaning of drought has evolved roughly over the last 30 to 40 years. Its primary meaning was focused on its physical absence or reduction and of course timing. Crop failure due to no or less precipitation is quite likely to have been the second stage in its evolution, compounded by lack of forage, pasturage and water for livestock as well as humans. Crop failure, as it did, could still affect the breadbasket of households leading them to starvation, malnutrition, disease, death and migration. The 1973-4 famine that struck most of Wello and Tigray, including Gäddärro, is a living memory of a formative stage of local meaning of drought as a socioeconomic problem. Repeated food deficits resulting partly from climatic reasons embraced them all the way to the 1984-5, the year they experienced another, yet greatest and severest drought-related famine in the recent history of the country. Repeated years of chronic food insecurity later made drought the synonym of famine. Today, many farmers employ the term drought to express crop failure resulting from excess rain or water-logging and consequential food shortage. Finally, it is worrisome but incontestable that drought has become a blessing in disguise. As a major access to external resource in the form of international relief aid, safety net packages and other forms of assistance, today, farmers are as much concerned in their supplication of God's succor for relief aid as they are for rain. Therefore, the meaning of drought has now become a state of social relations among community members; a state of ecological relations between farmers as living beings and their environment and finally a state of political relations between communities and the central government and the international community.

8.4 "Rain-Induced Drought": A Mere Poetic Expression or a Practical Problem?

Further complicating their fate, amidst generalized droughts, the rains could become quite unblessed. Heavy storms that denude the hills; that drive the soils away; hailstorms that destroy the crops; rains that create crop pests (stock borers) and many other yield reducing problems are associated with untimely and heavy rains. Therefore, too much sunshine is preferred to too much rain. The saying *"zïnab hamba yälläwïm"*, "rain spares nothing", reflects the more destructive nature of rain compared to drought. Following this, there are times drought *("good sunshine")* is preferred to much "*worthless rains"* as in the *kïrämït* of 2007. Comparing drought with heavy rain, the latter is viewed as a cause of soil erosion whereas the former could render the environment dry but improves the future capacity of the soils. As a result, a new form of defining drought, alien to the state and scientific perspective(s), is developing among farmers as they are re-orienting their perception of lack of rain in the ups and downs of socioeconomy and nature.

Walka soils (vertisols or black cotton soils) are highly vulnerable to water-logging and a farmer from Mïsïräta, who was cultivating such a land during the excessive rain in the *kïrämït* of 2007, redefined drought as follows: "By drought we also mean untimely rain and excessive rain. Such rains destroy the plants as the current *dry rain* is destroying the beans fields… Because of it, the beans are getting dry. Hence, we cannot call it rain. It is not yet different from drought."[166] The phrase *"yäzïnab dïrk'"* that is *"drought-induced rain"* has become a widely-shared phrase in their re-conceptualization of drought and rain, meaning in their direct perceptual engagement with the environment (Cf. Ingold, 2000). Here, we also see what is perceptual becoming cultural through time. In this case, rain that results in the same effect as drought, for instance food shortage, seems to be logically equated with drought. It is not

[166] Interview transcript

rain as a physical entity and its physical consequences on the rest of the environment which is given superiority in re-conceiving drought here. Rather, it is the social and economic consequences of drought and rain on humans and their economic base that is emphasized. Such a re-conceptualization compares with the re-conceptualization by the international aid community of the situation that has been taking place in south Ethiopia over the years. The oxymoron, "the green hunger", employed to express mass starvation amidst a greening landscape, was conceived along the same line of thinking. For the experts, however, drought is drought and excess rain, excess rain.

8.5. Representation of Drought as a Socio-economic Problem

In this section, I focus on the origins of drought, its memories, images and experiences as a socio-economic problem in Gäddärro. In local perception, drought is an old problem but as a ubiquitous feature of the environment it is remembered since the 1970s.[167] Since then, every time drought occurred there were production crises and immediate food shortage, hunger and even famine of the 1984-5. Thus, in Gäddärro, as in other parts of Ethiopia, drought has become synonymous with these conditions. Local residents are composed of those who have experienced drought and famine themselves and those who have heard of their experiences from their predecessors. Today, it is not difficult to find an old person of 80 or more recounting the plights of their dead parents during the 1988-92 famine and epidemics that plagued the entire north and east Africa. The famine that hit the area for a year in the early 1930s is also well remembered among the older generations. It is even simpler to see a 60 year old mother who survived the specters of the 1973-4 drought and famine. Most of the young people in their 20s and 30s have survived the more crushing and deadly famine of 1984-5. Since the 1974, nearly every year,

[167] This is notwithstanding the condition that from oral history many residents remember the 1988-92 drought and epidemic induced famine that affected their ancestors. They also knew that their area was affected as part of the problem which ravaged not only Ethiopia but also north and north east Africa at large. My key informants, including some elderly villagers, remember episodes of droughts affecting their communities in more recent periods as in the second and third decades of the 20th century.

farmers faced problems in which the weather has been always implicated. As a result, they had to live under the vagaries not only of acute but also chronic food insecurity. Therefore, none of the living generations in Gäddärro, for that matter in entire Ethiopia- except a fortunate handful- have problem feeling drought or famine.

According to local accounts of the 1973-4 drought/famine, those who passed through the experience recall that the drought started in the lowlands in 1973. As part of their traditional coping mechanisms lowlanders drove up their livestock to the highlands, including Gäddärro. These livestock and their owners survived the year because there were food and grasses, and crop stocks in the highlands. As 1974 begun the drought was creeping up the highlands such that in the year drought was everywhere. However, in the highlands there were some carryover forage and some wet-lands were green such as in Absaro, K'és Gända and Šola Gända. When the drought and the famine were in their full swing both humans and animals were affected. The loss of life on the part of humans was said to be huge. It is also believed that because of the *däwla,* which is already mentioned in Chapter Two, humans were more affected than livestock. Even when the problem was giving way, though the drought was somehow prolonged, animals were able to rehabilitate faster as the vegetation was starting to improve. My informants who survived the drought/famine remembered all plants but eucalyptus dried. In the 2008 *billagi* drought, I have witnessed eucalyptus trees drying in Gäräk'äfo, Hat'äti and Adami hills and uplands. This might be a cause of concern if these communities have been heading towards a drier environment in spite of the great many resources invested in SWC activities over the last four decades.

Plate 14: Partial view of eucalyptus trees drying from the bïllagi 2008 drought in Gäräk'äfo mountain

Local stories of the past are replete with bad memories or images of drought/famine occurrences. A baby sucking the breast of its dead mother; groups of dilapidated villagers sick and tired of burying their dead; experience of burying dead bodies in mass; villagers picking scattered grains along truck road; starving mothers putting themselves before their dying babies; lack of relief food and timely state recognition of the problem and relief assistance; as well as exodus of involuntary resettlement into other regions are among those images that crop up in the minds of those who survived the 1973-4 and 1984-5 famines. These famines had attracted the efforts of a great many national and international scholars (e.g. Dessalegn, 1996; Mesfin, 1991; Alemneh, 1990), not mentioning the media and the press of the NGO communities. And as we have reviewed some of these writers in Chapter Two, different theoretical perspectives have been forwarded. Governments and NGOs have largely focused on drought to explain out the problem.

8.6 The Social Aspects of Rain and Drought

During scarcity or drought, in order to get the mercy of God (that is rain), villagers gather for the collective prayers called *wädaja*. The organization of prayers is quite a process. The *k'iré*[168] forwards the proposal; the group analyses and mostly accepts it; a day and venue are set for the prayer; money, grains, and fuel wood are drawn up to prepare the feasts where an animal is also killed. Households also draw some *ïngära* (a traditional staple) to be served at the gathering. *Çat* and coffee are served, too. Preparatory activities such as fetching water, cooking, making the spaces and serving the gathering are carried out by men, women and the young, irrespective of the normal gendered and age-based division of labor. However, all these material preparations are said to be useless unless individual members of the village or villages involved are also spiritually prepared and come with pure hearts, clearing all animosities, grudges and bad feelings that could have existed among them. As already said, the logic is that lack of rain is caused by the wrath of God. Therefore, the belief is that unless people have reconciled among themselves they could hardly do so with God. The actual religious rituals are quite elaborate and prolonged, including the reading of verses from the Quran as in the wädağa I attended in Säybäro in 2008.

[168] This is a village head responsible for self-help social activities such as burial and the organization of collective prayers.

Plate 15: A wädağa in session in Awraççа

My key infornmants have analyzed these occasions as those of resource redistribution within communities. People can have access to free coffee, *çat*, meat and well-cooked food, which might not be afforded otherwise. Notwithstanding this, their importance in terms of mending broken and severed relationships and carrying the group forward as a functioning unit cannot be overemphasized. Forgiveness (*auf)* is an almost institutionalized practice on such prayers and in everyday social, economic and political interactions. Therefore, as a result of the socialization caused by propitiatory prayers organized because of drought (and occasionally excess rain), community members re-scrutinize and mend their fractured relations before it is too late. This is an aspect of culture in which the relationship of humans, rain, and God is collectively reenacted, reviewed and revamped for the collective good of the social and the bio-physical environments.

What is more, availability of good rain and collecting good harvest from the land because of good weather is marked with thanksgiving rituals of similar social significance. For these rituals, organized when crops are ripe, fewer crowds than for the droughts are gathered in mosques or *zawwiyya,* where children, men and women bring some produces from the crops brought into fruition by the blessing of God. There, people pray and thank their Creator for the good harvest He has given them. They also pray that the next harvest be as good, if not better, before the crowd is dispersed. Not doing this is believed to be disappointing the guardian spirit/s *(abdal or k'ut'ïb)* of each village whose anger could destroy the already ripe crops or those of the forthcoming years. It is often said that humans have to remember their Creator both during good and bad times.

These ceremonies are parts of the traditional agricultural rituals. Local exegetes complained that new religious thinking, the growing privatization of life, the commercialization of social relations, secularization of agricultural production as well as fierce competition for survival amidst ecological and socio-cultural pressures, have reduced the social enthusiasm and the frequency with which such events are organized currently. In this connection, remarkable is a statement made by an elderly man in Awraççа, "*Du'a* and *çat* used to be the walking stick of Wärräbabbo."[169] The elderly said that this walking stick has been in jeopardy and that was why their land is exposed to drought, poverty, hunger and other difficulties. In their perception, the problem is that their prayers carried out amidst such aura are not heard as much as before. In the past, when they took to the trees to pray for rains, it was said that it rained before they left the site. Nowadays, this is no more and many describe the situation as the sign of Akira (The Final Day). For the traditionalist, it is the time in which individuals questioning the past are

[169] Field notes

mushrooming without having good religious knowledge, without reading the Quran.[170]

The social aspect of rains is not conceived just positively. A little bit more rain than usual could cause problem of over-flooding. This will be a moment of misunderstanding and conflict among villagers, including those living in different villages as I observed, especially during the *kïrämït* of 2007, the time of the heaviest rains during my fieldwork. Village and FA land use committees and selected elders assisted by the agricultural development agents frequently arbitrate such conflicts. In all cases, plaintiffs were lower stream farmers whereas the defendants came from the upper stream. Apart from this, low rainfall could soon result in reduction of flow of springs and groundwater recharge, also signifying the deepening of the ground water level. During the 2008 *bïllagi* drought, there was a serious problem of water both for humans, gardens and animals, causing strict management of water points. Several rowdy *gosa* meetings were held to deal with conflicts emerging over misappropriation of scarce water as some offenders clandestinely run against the austerity measure of the communities. These households were suspected of stealing some water in the cover of darkness to water their nurseries and livestock.[171]

The most affected villages were the same as those whose crop fields were most affected because of the micro-ecological differences already discussed. Mïsïräta and Awraççа were the most affected whereas such villages as Kibi Méda and K'és Gända were less so. In Mïsïräta and Awraççа, sometimes households had to go up to these villages venturing the notorious uphill in

[170] A sheik once regretted that a person should not wear the turbans before reading the Quran and trousers before going to school. In his perception, doing so was what has brought the problems.

[171] Such conflicts are normally solved by communities themselves through the institution of *agäbar* (or *k'oti*) and councils of village elders or selected sheiks. Issues not solvable by communities and their structures are dealt with by the local social courts of the government.

order to get some water. The tapped water posts were supplied by underground streams or springs. Built by the National NGO called Water Action in the first years of the 2000s, during normal years the facilities supplied clean and adequate water to the surrounding villages. These schemes, which are also fixed with troughs for watering animals outside the enclosed water points, appeared to be relatively well managed but when there was a small drought the natural water cycle was affected as in *bïllagi* of 2008.

8.7 Local, National and Transnational Drought Coping Mechanisms

The history of world famines has it that the rich were instrumental in feeding and clothing the poor and the vulnerable during starvation, misery and death. Drought also accounted for at least one out of three famines that were experienced. This has been, for instance, recorded for ancient Egypt around 1700 A.D. where rich people fed and gave clothing to the starving in order to be remembered for their good deeds (O'Gráda, 2009). Rulers supplied their starving citizenry within the limits of their ability through the provision of food as well as forgoing or reducing what the public owed them in tax and due (O'Gráda, 2009). In both circumstances, moral obligation, the fear of civil unrest and transmission of diseases convinced rulers and the elite to act accordingly (O'Gráda, 2009). When for lack of ability or preparedness these institutions were not able to be of help and other coping mechanisms were impossible, humans had suffered hunger, malnutrition and death. Such annals of famines pervade the entire historical period from as early as the second century A.D. and seem to be poised into the future of humanity. The spatial extent of the problem has been as extensive as its temporal dimension. Famines that wrecked Asia, the Middle East, Africa, Europe, and North America, all reveal that it left nearly no part of the world untouched.

The developed nations have made this history, however. Unfortunately, those living in many poor countries of the world have still to face the brunt of merciless droughts and famines; at times adopting the kind of elementary

survival strategies employed by their fellow human beings in the west many centuries ago. Famine affected Niger in 2005 and Mali in 2002. Most of the sub-Saharan African countries still suffer from it. More than 12 million people are threatened by "drought-induced famine" in the Horn of Africa (Ethiopia, Kenya, Uganda, Somalia and Djibouti) in 2011 and are in need of international relief aid. Rather politically and scientifically appealing terminologies have yet been reinvented for famine in the process of its 'scientifization' and politicization such as undernutrition, food shortage and vulnerability. It is possible to euphemize famine but this can hardly lessen or camouflage its pain. As a young man from Gäddärro remarked, "It might be possible to scratch the stomach but hunger knows nothing except food".[172]

Ethiopia had experienced several famines caused and accompanied by droughts, pest infestations and epidemics, beginning from its ancient existence before the Birth of Christ (Bahiru, 2008; Gráda, 2009; Pankhurst, 1961). The use of famine foods and even cannibalism was recorded for Ethiopia, as for the rest of the world. Traditional rulers did what they could, according to my informants in Gäddärro. Local elites left their granaries open for starved citizens crowding their homesteads and courts in 1988-92 (RRC, 1985). There were times taxes were postponed and dues forgone. Rich men granted debt cancellation if the next harvest again failed or performed weakly, even though back-to-back drought and famine are rarely experienced in the recent history of the country. "So and so let his grain pits open for the public"; "it was because of the generosity of so and so that we tied across those bad days" were the frequent rewards for rich men and rulers among their fellow villagers. Such coping mechanisms, nevertheless, did repeatedly fail so that people and livestock had to perish in thousands. During the 1888-92 famine and epidemic when such social fabrics were surpassed and there were rapacious death tolls on humans and livestock (Pankhurst and Johnson 1988), people eat such plants as *ant'aria (Portulaca oleracea L.)*, *gommän* (a

[172] Field notes

traditional cabbage), *alma* (*Amaranthus angustifolius*) leaves and some roots as coping foods, with the only culinary supplement they had, which was salt. What had happened in Gäddärro were full scale famine, human suffering, extensive human and livestock population deaths, and pestilence subjecting life to near complete destruction. Recovery was not less difficult. Elders remember their grandparents and parents stories about the complete dearth of seed stock to restart cultivation. In places like Awraççа, their surviving ancestors went up to the upland area called Ambassäl, from where they brought some seeds to re-start with. In Hulluk'o, it was said that an old man advised residents to visit termite mounds from where, it was said, they got few seeds of red sorghum, teff and some other seeds to start anew. Until official announcements of emergency situations brought relief aid, many citizens practiced coping strategies available within their reaches, including skipping meals, village-level borrowing and disposing productive assets and out migration. Today, the situation is by far better than before.

Recorded state response in Ethiopia dates back to the 14th century. The 1973-74 famine was rather an epitome of a monarchy lending a deaf ear and closed eye to a rather loud and eyeful famine that was building up. The new government that replaced the monarchy, concerned Ethiopian elites and the international community later responded profusely after the plight was revealed by a BBC journalist to the world. The west was quite late in its response during the 1984-5 rather large-scale and more devastating famine, but this time around, owing to political reasons. When the relief resources were made available, anyways, more than a million people were already dead. The provision of start-up seeds, farming tools and implements, draft oxen, though always wanting, has been part of the rehabilitation schemes. Paid-up public works, implemented under different appellations but vaguely differentiated implementations, still support millions of farming households whereby rural access roads and different SWC structures, tree planting and other activities are accomplished. These sets of international relief assistance

and development aid no doubt saved human lives, even though, as already stated, their timeliness, adequacy and efficiency have rarely escaped the critique of scholars and relief beneficiaries. All donor institutions and personalities in the west who generate the resources to the recipient and third world governments, as well as the beneficiaries themselves have their due share, both in the success and failure stories of disaster management in this country, as they undoubtedly do in the generation of the problem.

Since 2001-2002, all farmers were indiscriminately made to build rainwater conservation ponds under pressure that was termed positive obligation *(bäggo täs'ïno).* Nonetheless, most of these structures were filled by silts because of poor quality and some of them as a result of lack of care. Technical failure, which resulted in sub-standard collection chambers, was mentioned as the principal cause of their ineffectiveness. Those wrongly located along the course of floods were filled with silts. What is more, the reasons many farmers refilled the ponds were: a) there was a counter propaganda by opposition parties who made it public that there was coercion in their implementation and who also said the waters harbored malaria causing mosquitoes and were risky to small children and animals; and b) the farmers themselves were doubtful as to what benefit there was in keeping small water in ponds and said it was by far better to wait for the rains from God or rely on the skies. A farmer, who was so doubtful after some years, stated his surprise as saying "how come water with a cattle trough?"

Plate 16: A rainwater harvesting pond in Mïsïräta

Groups of selected farmers had these structures built for them more or less to the standard through government support which covered day labor, skilled manpower and materials. My informants, however, acknowledged some hardworking farmers have used the waters thus harnessed for vegetable development, supplying their produce to the markets. Seeing these farmers, the others again were pleading to have the ponds dug for them through government support. The response was for them to build these structures on their own if they wanted but promising to supply them with geo-membrane plastics on credit. Following this and other indirect means to induce farmers, at the time of the fieldwork, many farming households were digging such ponds primarily through family labor, also taking in rush the said plastics to seal the floors and walls of newly dug collection chambers.

8.8 Conclusion

Local conceptions of rain and drought are based on religious beliefs. Rain that is agriculturally useful is characterized as the symbol of God, nature and life. Its lack, drought and, excess rain, severely affect the performance of crops and livestock. Hence, drought and excess rain are seen as sources of misery and even death. God is regarded as the cause of both rain and drought but they also associate them with bad human behavior. If the relationship among villagers is in jeopardy for reasons such as theft, this is said to disappoint God and befall them drought or bad rains. Good rains are also explained as the rewards of God for good human deeds that appease Him. Scientific explanations of rain or drought are largely lacking except among some of the school going young people.

Ecology tremendously affects the economic value of rain in food and livestock production. In addition to proper amount and seasonality, the timing of rain within a season is a very important measure of its economic relevance in agriculture, especially crop production. Planting, take-off, grain-filling, harvesting, threshing and collecting are all affected by the amount, intensity and timing of rains. Precipitation rate is affected by a number of socioeconomic and ecological factors as well. The nature of the soil, landscape, crops grown as well as the quality of SWC structures affect the economic values of rain and the negative effects of drought.

Traditionally, there has been a very low regard to the economic value of water in agriculture as rain that comes down from heaven is taken as a free gift of nature. Based on this, there has been a subtle, sub-conscious expectation lurking in the hearts and minds of farmers that they should get rain the time their fields demand it. And, when nature does not fit to this cultural patterning of an otherwise climatic and predominantly natural phenomenon, farmers would say drought has stricken or nature has failed them. Governments and NGOs do the same. Therefore, the issue needs a change of mind. This

becomes one of the major challenges to tackle rain and drought related environmental problems currently faced in the country. A planned and programmed socio-cultural change might speed up this process.

Explanations of food shortage and famine range from those holding drought as the proximate cause to those holding it as a major factor. The former largely criticize lack of interest and preparedness on the part of successive governments and their wrong policies that have prevented farmers from being able to create reliable assets (Dessalegn, 1996; Daniel T., 2005; Mesfin, 1991; Sisay, 1987). Poor redistributive mechanisms are also stressed. Farmers on their part receive drought or whatever natural hazard befalls them as a divine retribution for their sins. This explanation has been recorded in the draught/famine history of the country since the medieval period (Gráda, 2009; RRC, 1985). Ethiopian states differ from farmers only because they change the farmers' God with nature's drought in their explanations of food shortage and famine (Mesfin, 1991). Nonetheless, none of the Ethiopian states seem to have ever exclusively defined drought specifically even though since the 1974 'drought-induced' famine, drought has been the principal justification for international relief resources every year, including the current period. The first-ever National Policy on Disaster Prevention and Management issued in 1995 defines disaster "as an event in which a society or community undergoes acute deprivation of food and other basic necessities due to natural and man-made calamities to such an extent that the normal function of the society or the community is disrupted and that it cannot subsist without outside intervention" (General Guidelines, 1995, p. 13). For smallholders, their local administrators, government, NGOs and donors alike, drought has been the principal reason exposing millions of Ethiopians to this deprivation. As a result, the chapter discussed that drought has become a form of smallholder-state-donor community relation. The National Policy on Disaster Prevention and Management (NPDPM) deals not only with emergency relief issues but

also rehabilitation and development, involving the international donor community, NGOs and all government sectoral agencies (TGE, 1993).

The chapter has documented ongoing shifts in local perception of rain and drought in which excess rain that destroys the crops is also understood as drought. Thus, a new concept of rain-induced drought has emerged over the years. The chapter has also discussed that amidst the much talked drought problem in the research area and the country at large; the people I studied are affected more by excess rain than drought or they believe this is so. Compared to the long past, the soil environment has generally got a reduced moisture retention capacity despite ongoing improvements. Therefore, rain that used to be lower by past standard could be heavier today affecting field crops and further eroding the soils. Another important finding of the chapter is that drought itself is recognized as an important agricultural input and every drought season in the local history was followed by exceptionally high volume of production. What is more, even during drought times some wet lands provided green vegetation or some crops. On the contrary, excess rain is said to be relentless destroying everything. As a result, the saying 'drought is bad but rain is worse' is frequently mentioned by villagers. While the perspectives of villagers match those of the government in many respects on rain and drought- as they do differ- that villagers have a less demonized view of drought than rain stands out as a stark divergence between the two perspectives.

As the major recipients of external resource in the form of international emergency relief aid, safety net packages, direct (free) support and other forms of assistance, many farmers are concerned in their supplication of God's succor for relief aid as they are for rain. The meaning of drought, in this regard, has now become a state of social relations among community members; a state of ecological relations between farmers and their environment and finally, a state of political relations between communities

and the government through which relief and development resources are secured and channeled. Of course, the state is understood by smallholders as one of the important pillars in conceptualizing their environment, its affordances as well as constraints. This supports one of my theses that the state and international donors influence the environmental understanding and behavior of smallholders.

CHAPTER NINE: CROPS IN MIND AND THEIR ROLE IN FARMING

9.1 Introduction

Grown in the district of Wärräbabbo are several types of cereals, pulses, oil seeds, root crops and some others, mainly depending on local agro-ecologies. From the cereal side crops grown are wheat, teff, barley, oat, millet, sorghum and maize. Beans, peas, chickpeas, lentils, chuckling peas and haricot beans are from the side of pulses. Oil seeds produced are sesame, linseed, Niger seed and *noug*. Added to these are different spices, vegetables and horticultural tree-crops such as *çat* and orange. The villages covered by this research, all in the drought-prone temperate (*wäina däga*) agro-ecology, grow nearly every crop produced in the district.

One objective of this chapter is the treatment of the economic, social and cultural understandings of cereals and pulses, while their agronomic practices, ecological impacts and implications are addressed as additional objectives. Other factors affecting the extraction of land-based resources in the face of changing socio-environmental contexts are also treated when necessary. Farmers' responses (adaptive and maladaptive) analyzed in this chapter are about the environmental problems discussed in the earlier chapters namely drought, moisture stress, excess rain, soil infertility, de-vegetation, land shortage, increasing local temperature and overall climatic variability. While it is clear that Ethiopian farmers relied on TEK for millennia, the introduction since the 1940s of WSK and inputs has had important impacts on and implications for agrarian resource use practices. Therefore, the chapter also considers these forms of knowledge and their action and interaction in smallholder farming, focusing on their environmental impacts. The two models of resource use are viewed on a par and no attempt is made to evaluate local knowledge against scientific standards.

In addition to considering smallholders' responses made to major environmental/climatic changes or crises, emphasis is given to ongoing-implicit and explicit-strategies applied to cope with localized stresses that rarely find the attention of scholars and authorities. Moreover, the chapter is central in justifying one of the themes of my dissertation that viable adaptations at one time could be non-viable and environmentally destructive at another. As such, it builds on the theory that conscious and purposeful human behaviors are not sufficient to guarantee sustainable use of natural resources.

9.2 Crops in Culture and Agriculture

9.2.1 Sociocultural Meanings, Values and Uses of Cereals and Pulses

Cereals and pulses are staple foods across the entire Ethiopian highlands. Some archeological evidences suggest that the use of the prototype cereal, teff, native to the country, might date earlier while its cultivation in the Horn of Africa is at least two centuries old (D'Andrea, 2008). Cereals are thus at the center of past and present dietary systems. Pulses have also been used largely as condiments to facilitate the consumption of staple foods and as complementary foods in the form of *ïšät* (green consumption), *nïrfo* (boiled grains) and *k'olo* (roasted grains). The traditional criteria used to judge food crops are diverse. Presumed nutritional quality, taste, prevention of hunger, green consumption, health, durability or economy of scale, ease of processing, prestige and mere aesthetics are used in judging the overall food quality of a food crop. For instance, nutritionally, by most of these standards, barley stands first from among the cereal crops. The lore, *gäbs länäbs* (keep barley for the self), reflects this preference. High body building (protein) and energy (calorie) giving qualities are primarily attached to barley. Taste, which is a matter of custom, is also applied to rank the food quality of crops.

Related to nutrition, the length of time a person could go without feeling a sense of hunger between the first and the next meal is employed to gauge the food quality of a given cereal crop. Thus, crops allowing longer times between meals are usually preferred by families with many children. In spite of scoring the least in taste, appearance and prestige, red sorghum is the most preferred in this regard. Barley is nearly on a par with red sorghum, described by a farmer as the king crop from which nearly all known foods could be made.

Cereals are also associated with good and ill health. For example, it is believed that individuals eating red sorghum frequently are less affected by disease. The crop is also known to be the best body builder and energizer for livestock, especially for draught oxen. Maize was for long believed to be a cause of malaria. Some suspect that its excessive consumption has the risk of reduced power of vision. Nutritionally, it is believed to have insignificant value. My informants said that it is good only to fill the stomach rather than build the body. It is considered a roughage crop but there is no awareness of it as a source of fiber, especially when consumed green (roasted and boiled). In spite of being one of the most widely grown and consumed cereal, wheat is clouded with much perception of negative health effects, including the relapse of illness. Barley, oats and red sorghum were traditionally preferred for consumption. Nutritionally and health wise, they were, and still are, surrounded by positive attitudes. Oat food is regarded with the same positive notions. (For a tabulated rank of local judgments of the major crops, see Appendix 15)

Durability (*bïrïkkaté*) refers to the amount of eatable units of cooked food that could be obtained from a given cereal crop compared to that obtained from the same amount of another cereal crop. Teff fetched the best result in this regard whereas red sorghum and barley rated second. Women said that more number of *ïnğära* is made of red sorghum flour than of the same amount of maize flour.

Aesthetics has always been an important parameter, reflected in the old adage *"siyayut yalamarä sibälut yakïral": "that which is not attractive to the eye is a cause of sickness when eaten".* White wheat and white teff are the most aesthetically valued cereals.[173] Teff is the most prestigious cereal among the Amhara and many other people in Ethiopia. While there are white, red and black varieties, the white variety fetches the highest status-honor. Black teff is regarded with low prestige in spite of being the most nutritious, according to my Gäddärro informants. Assorted teff, second in nutrition next to black teff, yields less whitish *ïnğära.* Nonetheless, the Gäddärro communities prefer assorted teff for its content and appearance. They complained that white teff finishes comparatively soon, scoring less on the parameter- *bïrïkkaté.*[174] However, this is likely to be just part of the explanation. White teff is the single most important crop which fetched the highest price on all Ethiopian markets. Therefore, rural households reserve this variety for sale while consuming the less prestigious varieties at home. Red sorghum fetched the least prestige in Gäddärro.

Culturally, pulses have all been regarded as crops of secondary food value. This is because pulses are not used in the preparation of main foods such as *ïnğära* and porridge. They have been largely prepared as stew, which is basic but still considered secondary. The term *mabbaya* is given to pulses to reflect that their use is primarily as a spice to facilitate the intake of main dish. Apart from this, pulses are valued as *nïrfo* (boiled grains) and *k'olo* (roasted grains), all of which are supplementary unless there is food shortage. From among the awns barley and oat still enjoy their traditional superiority as roasted crops and flour juice *(šamétta).* The latter is most preferred as a source of energy for

[173] White teff is also the most prestigious crop among urbanites in the country.

[174] The prominence of teff was accidentally revealed to me as I was interviewing one of the local agricultural development agents in the field. We had to suddenly halt our discussion over a rowdy conversation in the front yard of the house we were in that was taking place between two women. One of the women to the conflict was so openly affirming her family's superiority for being frequent teff eater unlike her adversary's.

men during enjoyment in bed. Horse beans, peas and chickpeas are also eaten green but just to satisfy craving (*amrot*) and not even as a supplementary food. The parameters used to evaluate the food values of cereals are also applied here, however. For instance, horse beans are seen as good body builders and good to health in the sense of not causing illness as do peas. Some of my informants remarked that pea is not much appreciated as food because of the belief that it aggravates already existing health problems. Especially when consumed green, too much of it, causes swollen stomach that is not relieved so easily. For men, especially for the sexually weak, lentil is said to be as good as barley. Largely, haricot beans are positively valued as food.

By local definition, cereals as staples are food *par excellence.* Therefore, while one can have other food, eating in proper sense of the term is incomplete without cereals. Ethiopian highlanders can hardly go a day without *ïnğära*, the traditional bread made of cereals. Perhaps, it could be said *ïnğära* is for many Ethiopians what *ugali* is for many east Africans. What is more, most of the men are said to be averse to eating *ïnğära* which is not fresh. It was said it loses its good taste. Some said that it was also a sign of inferiority for a male household head to eat *ïnğära* that has sat for days (even for a night) as town people do. Under normal circumstances, the same applies for water.[175] Eating and drinking fresh bestow a sense of superiority over towns' people.

Apart from serving as food**,** the economic value of cereals and pulses largely depends on their market prices and the values of their by-products as fuel

[175] It is men's preference to drink 'fresh' or 'hot' water as they call it, meaning water fetched the same day it is drunk, rather than taking water that has sat for a night or more. Such water is called *yäwïha amala*. Among societies where there is no clean water supply, this custom is likely to be a health liability because letting water sit for days could treat the water naturally. Today, all the communities I studied have potable water supply from springs developed some years ago by the local NGO known as Water Action in collaboration with donors such as Water Aid and Water Can Canada. Only during the dry months, most severely when there is drought as in 2008, do these communities face serious water shortage for humans, livestock and gardens, becoming a cause of misunderstanding and conflict resulting in serious of discussion meetings among villagers. The oscillation between abundance and scarcity of water is remarkable as I had the chance to observe and experience the problem at some points during my fieldwork.

wood and livestock forage. However, throughout history, the impact of the market has been minimal and current government intervention is aimed at commoditizing the production of high-value crops, though mostly horticultural crops. While on the fields, crops are sources of weed forage. After harvest, their stubbles are important sources of fuel wood. Crop stalks and hays are needed for animals though nutrition wise some are less valued. For instance, the consumption of wheat straw is said to waste animals. That of teff is said to cause stomach congestion and wasting. The by-products of the rest of the crops are said to be nutritious, especially when mixed with green fodder, according to experts.

9.2.2 Ecological Attributes of Cereals and Pulses

Ecological impact is one of the parameters crops are evaluated in. Some crops are said to be environmentally favorable while others are not. Most of the ecological knowledge, in this regard, is nearly common knowledge, transmitted from generation to generation. Crops interact with soils, trees, rainwater and livestock. Therefore, in order to manage crop production in a changing natural environment, a certain degree of knowledge of this is required. In this section, I consider just the major cereals and pulses that are currently grown. The objective is not to embellish a detailed description. Rather, by way of exemplars, it is to demonstrate as to how complex and interesting pools of TEK exist among farmers.

Wheat: There are four varieties of wheat[176] currently grown in Gäddärro, one of this being a modern variety imported from China and the most widely cultivated. According to TEK, wheat is among the crops that need intensive land preparation to break the clods and soften the earth since its germination capacity is weak. If a planted wheat grain is overburdened even by a small clod, the seed will rote rather than germinate. In terms of land requirement, in order to get the best harvest, it is said, wheat demands first-rate fertile land,

[176] Some of these are *ïnnat sïnïdé*, *k'äyy sïnïdé* and China wheat.

locally known as *bosäbos* or *läm märét.* It could also be grown on water-logged land called *walka* and less fertile land called *çinça* or *kontu* or *mät'at'a,* even though this compromises harvest. While wheat is grown both during *bïllagi* and *mähär,* for better amount of harvest and good quality, much of it is grown during *bïllagi.* Of course, in Gäddärro, comparably only a small portion of the land is assigned for this crop during *kïrämït*, primarily to ensure seeds for the next *bïllagi,* in a practice called *zär makïrämia*. This has been the norm unless ecological upset as in 2008 changes the situation. Wheat is drought resistant which is accounted to its solid rather than hollow stem. The crop has also the capacity to resist water-logging, if rain is a bit heavier, depending on the quality of the land. Nonetheless, it does not need much rain during planting and cutting. In the first case, the splashing effect of the rain will reduce its germination capacity, which is already naturally weak. In the latter, again, owing to its natural quality, the rains shall shatter the seeds easily. Its roots extract too much minerals from the soil. Therefore, land on which it is grown is treated with manure and/or composts in addition to crop rotation, employing such legumes as horse beans. Its roots, stems and leaves do not reduce soil erosion, either. Its chaff takes a longer time to decompose. Hence, it is not preferred in manure/compost preparation though it might be applied as a *t'ämäk',* to treat small rill erosion. Wheat is said to be more tolerant than teff for a less prepared soil.

Teff: There are three varieties of teff[177] grown and all are indigenous. Its land preparation is special in that it is more intensive. Teff crop has the smallest grains in the world and this has rendered it the least germination capacity. Thus, its planting is carried on a well-softened seedbed to ensure good germination. Planting is done by broadcasting it on the prepared seedbed, a technique peculiar to teff. Teff normally requires mid-level fertile soil; it overgrows and collapses on first-rate fertile land. It gives the best harvest on *walka* land and does not require manure unless the soil is so weak where some

[177] These are *näçç*, k'äyy and t'ik'ur teff.

application of modern fertilizers might be needed. Seasonally, much of its production is achieved in *bïllagi* for a better *bïrïkkaté* factor. Low rainfall in *bïllagi,* characteristic of the season, helps it maintain shorter stature and fill more grains. This notwithstanding, the ecological factor that lets the teff plant overgrow weeds in *bïllagi* frees farmers from the tedious job of weeding. Teff is grassy and this species nearness to wild plants renders it more drought-tolerant. Even under serious drought, it wilts but recuperates like the grasses when conditions improve. It has also good capacity to resist water-logging. Even though it might go reddish, when the water is drained or naturally absorbed, it will soon regain its natural color. In farmers' language, it will blacken once more. Ecologically, it is characterized as enemy of the land as its roots take too much soil nutrients. According to farmers, land on which teff is grown is nearly useless in the next season unless the soil is reconditioned by manure. Its morphology-weak roots, slender stem, slight leaves- are believed to expose the land to erosion, rather than protect it. Its chaffs are applied in composting. Though less valued, they are also fed to animals out of scarcity.

Barley: There are at least three indigenous varieties of barley[178] in Gäddärro. Barley's land preparation is comparable to wheat in terms of number of tillage but it does not need much softening of the soil as wheat and teff do. It can easily germinate out of an overburden or clod. Traditionally, this crop used to be grown on cleared hill lands since it requires first-rate fertile land, significantly contributing to deforestation and soil erosion. On hill lands, much of it is grown during the major wet season, *kïrämït* rather than *bïllagi.* First, it cannot get enough moisture during *bïllagi;* second, due to lack of other crops to spread risk, it shall be exposed to severe pest attack (birds and other beasts). Otherwise, total amount of land put to barley during both seasons is comparable. Its hollow stems render barley non-resistant to drought. During its tender ages and well before it reaches its full stature, the crop is well adapted to water-logging. Past these stages water-logging could

[178] *Ïnnat, amädé gurum and t'äbäl*

cause it to fall. Rain at its reaping stage would turn the color of its grains pale *(mäwäyyäb),* reducing its marketability. Barley is among the crops considered "friend of the land". Its roots are said to have "*bitamin"* (to refer to nutrients in general) that fertilize the land and its chaffs decompose easily to form humus.

Oats: There is only one indigenous variety of this crop as far as the knowledge of my informants goes. It does not require much labor in land preparation. It could be planted on the first plowing, that is *gïmïša*. Of course, many farmers believe that if it is planted during *ayama*, the head *(mätağ)* will grow slender, resulting in reduced yield. Oats can give good harvest on any type of land except very poor or *çinça* land. During *bïllagi*, it is said to perform very well on *walka* land. Comparably, oat doesn't require as fertile land as barley and wheat do. Seasonally, it can thrive well both during *kïrämït* and *bïllagi* even if farmers grow more of their oat during *bïllagi* to get food in the lean months of July and August *(hullät wär kïrämït)* and to ensure seeds for the next *bïllagi* season. Oats are susceptible to drought but more resistant than barley. Despite this, it is tolerant to water-logging unless the land is swampy or *walka*. It does not exhaust soil nutrient as wheat does and does not contribute to soil fertility as barley does. Farmers' knowledge put it between the roads. It has too much coating rendering its threshing and pounding quite difficult and reducing greatly the net usable content.

Maize: Currently three varieties of maize[179] are grown, out of which two are improved. Maize requires a well prepared and softened seedbed. Its preferred seeding is on the third round plowing. This crop is well suited to fertile (*bosäbos)* land; it performs less on *walka* and poor (*çinça)* land. On *walka* land, excess water retards its growth and on *çinça* land, it will have a stunted growth out of nutrient deficiency. While maize can thrive well during both seasons, its major production (*abbat addär*) is in *mähär*. Its planting is

[179] *Ïnnat, bunniñ, lïmat and amïrač*

performed using *bïllagi* rains; for its growth and fruition it is dependent on *mähär* rains. Maize does not have drought resisting capacity. It does not need much rain, either, thriving well on rain less than average. During much rain, the stem and leaves go red, it gets a tall stature and carry smaller cods later. Ecologically, both the roots and leaves of maize are excellent to fertilize the land. Farmers remarked that the roots have *bitamin*, and hold the soils firmly to the ground, reducing soil erosion. The stubbles and the roots decompose soon, further enriching the soil. Its stalks are not much valued as fodder even though in high use out of scarcity.

Red sorghum: There are four varieties[180] of this crop currently grown in Gäddärro, all indigenous. It requires a well-prepared land and based on perceived risk of weeding, it is planted either on the second or third plowing. Nonetheless, like some of the crops discussed above, it does not require breaking the clods much and softening the soils. Red sorghum is suitable to all types of land except *ïnnat zängada*, the prototype variety, which is not suitable on *çinça* land. The variety known as *ambassälé* performs on *çinça* land as well though not as good as on others. Red sorghum has always been planted in April as a *mähär* crop. It is highly tolerant to drought and has the tendency to recuperate even after apparently drying. Excess rain or water-logging does not affect it either but on its flowering stage untimely rain could wash the flowers away, reducing its grain-filling capacity. Farmers underline red sorghum dries up the land, to mean it exhausts soil nutrients. On the other hand, its spreading and deep-reaching roots are valued for holding the land firmly, protecting it from erosion. The stalks are valued as livestock feed. Its positive qualities justify its being the widely grown crop in Gäddärro and the district of Wärräbabbo as a whole.

[180] *Ïnnat*, *läfo, ahïyyo, ambassälé and wälé*

Peas: This crop has two varieties[181] all of which are indigenous. It does not need land preparation as its planting is done just on the first plowing. Peas require poor and marginal hill land, according to farmers and contrary to expert knowledge that all crops prefer fertile land. Farmers contend that on better or fertile land, it will fall from overgrowth, causing drastic yield reduction. On hill land, it will lean as if creeping, which will create an ambient condition for its growth based on local knowledge. On plain land, it falls since it cannot carry itself well, thus it ends up in a poor harvest. Pea has always been *mähär* or *kïrämït* crop. It is not drought-resistant by nature. As it is grown on *çinça* land it is not affected by too much rain. Pea is among the most ecologically friendly crops as it fixes nitrogen from the air. Secondly, as its cultivation is *šïrkït,* involving shorter plow-depth and widely spaced furrows, its cultivation does not expose the soil to erosion.

Lentils: Just an indigenous variety of lentil is grown. Like peas it does not need land preparation before planting and even during planting the land is poorly plowed. Lentil favors *çinça* and *iddari* land. On *bosäbos* (fertile) land it suffers overgrowth, falling on the ground as pea does. It is well suited to cultivation during *bïllagi* and *kïrämït* as well but mostly it is a *kïrämït* crop. It is drought resistant but once it has started flowering, it lacks this quality. If rain is suddenly terminated, it stops flowering which is essential for fruition. Lentil is resistant to excess rain. In relation to nutrient depletion, it is considered to be neutral by its nature. Lack of land preparation and light plowing are positive attributes preventing soil erosion. Lentil chaff is preferred as livestock feed. Local knowledge is that it does not cause stomach congestion on animals as some others do.

Linseed: There are two indigenous varieties carried over from the long past. Its land preparation is not different from that of lentils. Linseed is suitable to all types of land and even on fertile land it does not fall from overgrowth as

[181] These are *ïnnat* and *gondäré*. *Gändit* disappeared because its productivity was low.

lentils do. It is drought resistant and tolerant to excess rain, unless in extreme cases. Linseed is grown both in *bïllagi* and *kïrämït* seasons. It is characterized by farmers as a nutrient extractive crop even though not as damaging as teff. Since it is the least produced crop, this problem is not a concern at all.

Fenugreek: This is a single variety crop. On fertile land it could be planted during the first plowing provided that the soil is worked and sanitized. This crop prefers *kosi* or fertile land. Except on hill land where it does not thrive well, fenugreek is said to perform well on all other land types. If the land is well-prepared and softened, it does well even on *iddari* land. It could even grow on 'deaf' land (*däniḱ'oro märét*), which is swampy or so leached and does not accept even fertilizers to recondition it. Hence, fenugreek seems to be the best crop for a degraded land. Unless very serious, it is tolerant to excess rain. Though not as bad as linseed, fenugreek is a nutrient extracting crop.

Local knowledge is quite detail on the ecological attributes of all crops grown. On the whole, in relation to soil, crops are categorized as those depleting the soil and those enhancing its fertility. According to this knowledge, the main crops depleting the fertility of the soil are teff, red sorghum, wheat, oat, linseed, fenugreek, onion and millet, in a decreasing order of depletion. On the other hand, crops that enhance soil fertility are maize, horse beans, peas, haricot beans, barley, potato and tomato. Those not falling in these categories could be regarded as neutral. Wheat, barley, maize, linseed and fenugreek are among the crops that need first-rate fertile land to thrive well. Teff, oats, and linseed partly require second rate fertile soil to give the best yield. Peas, lentils, and partly linseed are poor soil loving crops according to TEK. Regarding moisture requirement, wheat, teff and sorghum are drought resistant from among the cereals whereas barley, oat and maize are vulnerable to drought stress. From the legumes, lentil and fenugreek are said to be partly resistant to drought stress. Some other crops such as sorghum and teff are also resistant to excess rain or water-logging. This traditional knowledge is partly

the basis on which farmers have been managing their crops in order to cope up with drought, excess rain and other environmental risks. That some of the crops also favored infertile or degraded rather than fertile land has been an advantage in the face of the current land degradation problem. Some of these crops also required the practice of minimum tillage contributing to farmers' adaptive strategies. The ecological impacts of crops are well perceived and this knowledge is considered in the decision-making to grow crops. The prototype crops in Gäddärro's farming history are generically referred to as *abbat addär,* a term used to indicate indigenousness and seniority in many other respects as well. (Appendix 16 has ecological impacts of the major crops grown).

The notion that TEK and beliefs are time-tested, inter-generational and well-suited to a particular ecology is verified by the experiences discussed above (Cf. Berkes, 1999; Maurial, 1999; Sillitoe and Bicker, 2004). These knowledge sets also cut across time and space if applied in similar agro-ecological contexts, refuting the proposition that TEK is applicable only to specific localities.

9.2.3 Local Knowledge of Landraces and Improved Crop Varieties

A superior number of farmers in the research area are aware that local cultivars, through a long period of exposure, are well adapted to the soil, to the climate and to pests and diseases than new ones. On the other hand, they are also quite supportive of the improved new varieties grown over the years and look forward for more of their types. A few farmers are currently praised for carrying some of the old seeds while some have disappeared. The main dissatisfaction of farmers with the old varieties is their long period of maturation. Long maturation period means giving up the chance of using the land for another crop during the year. The extended time also means long exposure to climatic vagaries and attacks from diseases and pests. The labour requirement to protect crops on the field would also increase. Accordingly, the

old varieties need to function against new cultural schemata of space and time in the context of continual environmental and climatic changes. Stock borers attack red sorghum and maize from early stages on. The application of chemicals on the old varieties could lose effect before the crops have finished their development, risking re-infection and necessitating re-application of chemicals. For this reason, there is a high demand for chemicals and short-maturing varieties.

Particularly since the 1980s, different improved crop varieties namely maize, wheat, field pea (*mašo*), garlic, tomato, carrot, cabbage, and chickpea are being supplied to farmers. These seeds have been supplied largely on credit though adequacy and timeliness have always been problematic. Among the factors that make a variety improved in farmers perceptions are high yield, short maturity, quality, drought resistance and compatibility with the overall local agro-ecology. Currently, there are limited numbers of crops for which the government has supplied improved varieties. For wheat there are two modern varieties. These are HR 1685 and HR 604. The latter is applied to some extent. The productivity of both varieties is 20 quintals per hectare of land. While there are different indigenous varieties of wheat, the average yield per hectare of those currently grown is 17 quintals. There are three improved varieties of maize in use in the district. These are Awasa 511, *catomani*, and PHB 3253. The WDARDO bought 13 quintals of PHB 3253 from Pioneer Hi-bred Seeds Ethiopia PLC at a cost of 1920 Birr per quintal in 2009. It was distributed to farmers in 02, 04, 06, 07, 08 and 09 FAs freely.

According to the WDARDO, the highest production per a hectare of land is obtained from maize which is 25 quintals in traditional method of cultivation and 32 quintals with improved modern agricultural inputs. Similarly, sorghum, field peas, wheat and barley did 22, 16, 15 and 14 quintals, respectively. Using modern techniques, the yield from these latter crops is 27 for sorghum; 20 for wheat and 19 for barley. Modern inputs are not yet

applied on the others. Farmers in the district still use traditional varieties of teff. They had placed a request for improved varieties to the local government which was not yet fulfilled. In the 2008/9 production year, a quintal of the improved variety known as cross-37 was approved to be purchased from the Sirink'a agricultural research station. However, due to shortage of budget it was unlikely that it would be procured in 2009, the time this information was obtained. The average yield of this crop is 12 quintals per hectare. The situation is the same for barley. There have been no improved varieties distributed as yet. Farmers on average reap 16 quintals from a hectare of land. Similarly, oats grown are all traditional varieties from which farmers get 11 quintals per hectare. For millet as well, varieties are all traditional and the crop is grown just in 01 and 06 FAs. The yield is said to be 10.5 quintals per hectare. Largely, grown in the district are traditional varieties of sorghum. Among the local ones are Hawwa Gïzaw and the white-colored, *goddalét* (mainly grown in 02 FA). *Abširo* and *gobiyyé* are modern varieties developed at the Sirink'a research center. Mostly, they are grown in the low land parts of the district. The productivity of sorghum is 27 quintals per hectare. (The productivity of traditional and some modern varieties of crops are presented in Appendix 17 and 18).

9.2.4 Level of Crop Production, Consumption and Food Gap

My household survey has tallied with findings from qualitative interviews that most of the households depend on international relief and development aid to fill recurrent annual food gaps. According to WDARDO, these programs cover food gaps of three, six and nine months to thousands of households every year.

The questionnaire roughly divided production years into one of low, average and high production, the question of how a year was to be rated depending on the judgment of the respondent. On the whole, year of low production had to do with drought, bad rains or pests and year of high production to the

improvement of these same ecological conditions. Year of average production had to do with the same climatic conditions but micro-agro-ecological variations such as fertility and size of land holding, use of inputs and cultural practices had some impact. These factors, together with others, are reasons for differing amount of yield among farming households. The survey showed that during low production year, 75.78% of villagers are able to sustain themselves just from two to four months of the year on own produce. Overall, low production and the inability to provide for food needed for the year is a problem affecting more women headed households than those headed by men. According to my survey, 73% of households headed by men were affected compared to 87% of female headed households.[182] Less numbers of households than for low production years are affected during average production years. Out of the total villagers, 58.59% reported covering five to seven months of such a year on own produce. Again, of the total, 20.31% households did this just for two to four months of the year, increasing the percentage of households failing to cover their food for more than seven months of the year even during production year to be called average.

Year of high production is rare in the face of the problem of drought, irregular rain, excess rain and land shortage and other constraints. Despite this, when rains and other climatic conditions are suitable, 38.28% of the total households are able to fend for their food provision from 10 to 12 months of the year, from own produce. Just 2.34% of households reported that they could do so in years of low production year. This shows that there is difference of level of production and vulnerability to poverty among farming households because of ecological factors. Of course, this figure is quite less

[182] The question of who heads a household in Ethiopia is a gender biased issue, running in favor of men. Households with both parents, a husband and a wife, are automatically taken to be headed by the man irrespective of their responsibilities and contribution to household economy. Only households with a single parent, that is a widow, are taken to be headed by a woman. As this is not the place to argue this gender disparity and the questionnaire was administered to men in households with two parents and to women in households just with a widow or a divorcee, I have adopted the same distinction in the analysis of the data as well.

than that estimated by my key informants. According to them, about 5% of the households in all the three ethnographic villages are able to produce enough for themselves even during low years of production, unless the ecology is exceptionally forbidding.

Table 7: Number of months sustained by households from their own produce during low, average and high production years (R=128)

HH type	No. of months covered (LPY)				Total
	1-4	5-7	8-10	11-12	
MHHs	77	24	2	2	105
FHHs	20	1	1	1	23
Sub-total	97	25	3	3	128
HH type	No. of months covered (APY)				
	2-4	5-7	8-10	11-12	
MHHs	20	63	17	5	105
FHHs	6	12	3	2	23
Sub-total	26	75	20	7	128
HH type	No. of months covered (HPY)				
	4-6	7-9	10-12		
MHHs	19	45	41		105
FHHs	6	9	8		23
Sub-total	25	44	49		128

HH: Household; MHHs: Male headed households; FHHs: Female headed households; LPY: Low production year; APY: Average production year; HPY: High production year

Source: My survey, October 2009

Households who could carry themselves from own produce for entire year, are also those who could consume carryover stock or supply the market with more amounts of grain crops. They are also the ones serving as the major source of crops and cash credit for their fellow villagers during ordinary shocks and times of emergency. All of these households are headed by men while eight out of the 24 FHH covered in the survey could trek from 10-12 months of the year on own produce. Whereas 96% of MHHs reported to be covering up to a maximum of seven months during low production year, the figure for FHHs was 91%. In the case of average and high production years, the percentages were 79 and 61 for MHHs and 78 and 65 for FHHs, respectively. Overall, during low production year, 95% of the research communities face a shortfall

of food from own produce from one to seven months of the year whereas nearly 62% of them face the same shortfall during high production years.

In general, the survey goes in line with the qualitative finding that the majority of households depend on relief and development aid to connect to the next season's harvest every year. Households employ other coping mechanisms as well to supplement the food gap such as sale of livestock, petty-trade, off-farm activities, day labor as well as credit and remittance from out-migrating household members. Therefore, the number of food deficit months in the year decreases because of food purchase from the market by these proceeds. Notwithstanding this, in the final analysis, the condition that most of the households are supported by government and aid agencies remains unchanged. Numbers of households served by such programs over the years are presented in Chapter 12 where these external opportunities are also discussed as part of the coping mechanisms that have been employed over the years.

Ïnğära eaten with stew is the staple diet of the Amhara and the custom is the same with the communities I studied. This food is largely consumed for about eight months of the year from September to April. *K'it'a*, a traditional circular bread is consumed throughout the year as a supplementary food in well-off households whereas it is consumed as a major food in poorer households. Roasted and boiled grains could be made throughout the year but they are largely consumed during three months of the year. The food called *gänfo* (porridge) is also consumed as a major food next to *ïnğära* and stew. September, February, March, April and August are the hungry months of the year. Reduction of food intake and other coping strategies including those already mentioned are employed.

9.2.5 Major Crops Grown in Timeline

Some elders remembered that during their childhood around the first decades of the 20th century, Bäk'alo produced red sorghum; Huluk'k'o, sorghum and

red sorghum; Säybäro, sorghum, beans and red sorghum. Absaro grew good *bïllagi* beans, red sorghum and maize. The more one went up the mountainous terrain to Little Gäddärro; the more the type of crops produced were. The ecology (the land and climate according to elders) determined what were grown so that those who tried planting onions in Hulluk'o had to harvest "just the leaves" as the plants did not develop roots. The vertical increase in temperature and its impacts on cropping system used to be an issue of local environmental prophesies such as: "Finally in Gubbisa cotton shall be grown; and henna shall be grown, too".[183] The time these prophecies were made, it was said, out of the cold weather, even maize was not grown in Gubbisa. Contrary to this, today, grown are henna and red sorghum, both of which are hot weather crops. In an apparent reference to the current serious pest problem, it was said, even in the good olden days, there were pests. In *bïllagi,* there were red blights (*k'äyy wag*) attacking oats. Sorghum was affected by the still problematic uziz (*çoräs or lambé*) as it reached tussling *(margäž)* stage. When some pests were seen the news was blown to villagers, a *wädaja* was organized and the pests were perished.[184]

Currently, the major crop grown in the district is sorghum, covering a share of 51% of the total grain crops produced.[185] Teff and maize ranked second and third with respective shares of 10.3 and 8.8 percents while wheat and field beans stood at fifth and sixth with shares of 4.63 and 4.58 percents, respectively. The rest was covered by other cereals, pulses and oil seeds.

Crops are temporally classified as indigenous and new comers. The first ones are those grown by the ancestors since settling in Gäddärro and the new comers are those introduced since then, whether the origin is within the

[183] Field notes

[184] My informants said such collective prayers were accompanied by the killing of red chicken as propitiatory sacrifices.

[185] A questionnaire filled by the Wärräbabbo District Agriculture and Rural Development Office, October 2009.

province of Wello, other provinces or overseas. Red sorghum, barley, and horse beans were the major crops grown in traditional Gäddärro. Next, oats and field peas were also grown. Teff is very likely to have been grown in the district of Wärräbabo prior to the settlement of the Gäddärro ancestors. Its widespread production and consumption were restricted by the feudal authorities. The introduction of maize from Çäffa Robit, a lowland area, was also delayed because of the belief that its consumption caused malaria. Onions, promoted by government agricultural extension nowadays, as a commodity crop to diversify household income, were also delayed for a cultural reason that their consumption caused a skin disease called *ğuzan.*

Apart from these sociocultural and ecological factors for delayed cultivation of some crops, the late introduction of agricultural extension and the less exposure for centuries of highland Ethiopia to external contact could be regarded as additional factors. However, through time, many new landraces, national and exotic, have been introduced impacting on both economy and ecology. For instance, even though sorghum and maize still dominate cropland coverage in the district (in *kïrämït*), in general, according to elders, the proportion of awn crops relative to sorghum and maize has increased over the years. Traditionally, people cropped less during *bïllagi.* Nonetheless, with growing resource pressure, more and more land has been brought under *bïllagi* awn crops involving nearly all farming households. During *mähär,* beans, peas, lentils and occasionally teff and other crops were planted mainly to ensure seeds for *billagi* planting. Then red sorghum was also grown in Mïsïräta and the surrounding villages. In the highlands such as Gubbisa, sorghum was not known since the cold weather was not conducive to it. Maize was also a marginal crop lightly grown just by few farmers in Gäddärro, because of its late introduction from Çäffa Robit. Nowadays both are grown thanks to increasing warming.

Table 8: Major crops (cereals and pulses) grown during the four regimes since about 1989

Crop type	*Menelik II (1889 - 19913)**	*Haile Sellassie I (1923-1974)**	*Därgue (1974-1992)*	*FPRDF (1992 - to*
Red	XX**	XX	XX	XX
Barley	XX	XX	X	X
Teff	X	XX	XX	XXX
Oat	XX	XX	X	X
Wheat	-	X	XX	XXX
Maize	-	X	XX	XX
Horse	XX	XX	XX	X
Peas	X	X	XX	X
Lentils	X	X	XX	X
Haricot	-	X	XX	XX
Onions	-	-	X	X
Garlic	X	X	X	X
Green	X	X	X	X
Orange	-	-	X	XX
Khat	-	X	XX	XXX
Eucalyptus	-	X	XX	XXX

Source: My ethnographic data

** The interim between the two regimes cover the short-lived rules of emperor Zewditu and Lij Iyasu which could fairly be taken to fall in either side of the periods.*

*** The sign "X" indicates whether a crop was grown and the extent of production*

Roughly over the last one and a half century, more crops have been added to those locally growing indigenous varieties while some indigenous varieties have died out. Their introduction was contingent on historical, cultural and ecological factors. In this process, short-maturing varieties have advantages such as risk reduction amidst growing precipitation problem and unreliable timing of the rains. Letting crops in the fields for a shorter time decreases this risk and short-maturing varieties allow better chance of manipulating drought. When the pool of traditional landraces was affected, not only it was necessary to do several alterations in their temporal and spatial arrangements but also in their agronomic and technical practices. The following section discusses such

contemporary and past coping or adaptive strategies along with their economic and ecological impacts and implications.

9.3 Traditional and Modern Crop Production Practices: Ecological Impacts and Implications

9.3.1 Land Preparation and Planting

Land preparation is affected by a number of factors the most important of which are the crop to be planted, household availability of labor, oxen, capital, farm size, soil type and the threat of weed infestation. In theory, depending on these factors and some others, land preparation could involve many rounds of plowing for cereal crops, especially awn crops. In practice, I was able to observe just up to three rounds of plowing, including planting. In one case, I observed a farmer planting wheat, one of the crops requiring intensive land preparation, without seedbed preparation. Currently, land preparation involves: clearing vegetation and overgrowth in and around the fields; plowing; hoeing land inaccessible for plowing; soil fertilization; as well as construction and repair of SWC structures. There is a common Amharic saying, *"ələbabɨsäw biyarɨsu baräm yɨmmälläsu"*. It stresses the importance of seedbed preparation, which, if not well done will only procrastinate more arduous labour during weeding.

The first plowing in seedbed preparation is called *gɨmɨša*; the second but not last *ayama* and the last *zär,* carried out to cover the seeds. Before 1974, this used to include the clearing of trees and bushes and burning the trunks and the woods to carve out a field from forests and bushes. Even during the *dergue* time, it also used to involve the digging with metal tipped hoe of "virgin" or *iddari* land or hill lands. Since the cultivation of hill lands (virgin lands) was largely exhausted and further practice on the remaining few was restricted by government regulation, this technique is generally out of practice today. Therefore, instances in which hoeing is practiced currently are when an *iddari*

land is re-cultivated and croplands are expanded into field margins in the desperate attempt to expand plot. Thinning or demolishing bunds, which are also driven by the hunt for more agricultural space, involve hoeing. In all cases, hoeing is performed using the locally made implement called *däŋgora,* composed of a long wooden handle and a long metal tip or plow. This tool is also used in places not appropriate for plowing.

Experts advise farmers to do the first plowing as soon as the harvests are collected. According to them, this allows to do the job before carryover moisture is lost and the land gets stiff. Doing *gïmïša* as soon as the harvests are collected will also help to retain moisture. Another advantage of doing so is said to be breaking the cycle of some pests by exposing their eggs or larvae onto the surface and sunshine, killing them before the next season arrived. It shall also allow farmers to preempt compacting of the ground by livestock where free grazing is practiced. Moreover, doing so shall have the benefit of mixing rubbish with the soil, facilitating better decomposition and fertilization of the land. Experts' advices go well with farmers' thinking in these regards. In practice, however, farmers might not do the first plowing as soon as experts wish them to. The local theory *"ïndäzännäbä zïra, ïndädäräsä bïla": "plant as soon as it rains; collect as soon as it is ripe"* is short of fully practiced.

The second *ayama* would be carried out after about a month or so and according to local theory, the rest of the *ayama* could be carried out as deemed necessary. During *ayama* deeper plow *(sïbbät)* is applied so that the inner fertile soils come up and the crops do well. *Ayama* also deals with parts not treated during *gïmïša*. The number of *ayama*, among others, depends on land quality.

Traditionally, during land preparation and after, crop stalks were left in fields. Unintentionally, if not unconsciously as well, such matters helped to improve the humus content of the land. As of recent, *gulgualo* (harrowing), which is removing stalks and weeds, has been included to break the clods and soften

the soils and as a source of fuel wood. Harrowing is done during planting and after germination has taken place as part of the first-round weeding or cultivation, also leaving hips of stubbles in the field to be collected later. The practice of leaving the stubbles in the fields after harrowing is not regarded by farmers as disadvantageous as experts do. Blaikie and Brookfield describe 'crop residue incorporation' as one of the successful conservation techniques as far as small farmers can go without it for other purposes such as fuel wood (Blaikie and Brookfield 1987, p. 30). Expertise knowledge that stock borers take refuge in stubbles is just forming among farmers because of the teaching of agricultural extension agents. This knowledge is however challenged by the belief that pests are created by God and stock borers are recent creations in their agricultural history. Experts stressed unless the land was prepared and well-softened and stubbles are removed, it could become a breeding ground for pests.[186] The practices of harrowing and removing the stubbles (though not as early as experts advise farmers) are part of local adaptation to growing land shortage and concern for the weakening soil environment. Farmers have reasoning not compatible with that of experts- hence; the practice of harrowing and removing stubbles is on the increase. Before leaving this issue it behooves mentioning that Blaikie and Brookfield's quotation above implies that scientific knowledge itself is subject to ecological change. The relatively free or less pest infected ecology of the past has influenced both of these forms of knowledge to rightly regard leaving residues in fields as an effective conservation technique. After the ecology is changed, however, by increased pest infestation and increased drought, both local and scientific knowledge seem to be affected.

[186] What is more, as every seeds do not germinate, less prepared fields consume too much seeds. In practice, farmers do land preparation just for cereals. Experts complain that their recommendation is not accomplished for pulses. Farmers on their part contend that from experience the recommendation does not work. Hence, the difference in this regard continues.

As stated already, the depth achieved in plowing (*sïbbät*) is one of the techniques of land preparation. *Gïmïša* is done with a shorter *sïbbät; ayama* with a longer *sïbbät* and *zär* or planting with a shorter *sïbbät* again. During planting, if the seeds are buried too deep, they will not germinate. That is why plows of different lengths are applied to regulate the depth. The length of the tip of the plow is adjusted by means of *märïgät'* and *wägäl*. This could also be achieved by applying *ïrïf* (plow beam) of different lengths. Deeper *sïbbät* softens the soil and brings the inner part up and the upper down to get a better harvest. It also allows better rainwater infiltration and conserves the *nïšš* (moisture) for a longer period. Especially during low precipitation seasons, the technique allows to get relatively better yield. The detailed adaptive descriptions given in Chapter Eight in relation to the *bïllagi* of 2008 drought could serve as good epitome of this. Plowing deeper at seeding can reduce the germination rate of weeds according to both farmers and experts.

Plate 17: Land preparation for planting in Awrraça

As part of land preparation, a number of other activities are also performed. Trees, tree branches, hedges, and bush matters in and around fields are cleared to preempt space for crop pests and beasts as well as avoid shading effect on the crops. Of course, much of the clearing is not done in *gïmïša* unless there are bushes and overgrowths to be cleared to facilitate plowing. Most of this is done when the crops reach their fruition stage and attract the beasts. This practice is supported by the cultural schema that crops and trees do not go together spatially. It is also important to note that the clearing of vegetation as part of land preparation is not driven by these factors alone. Another reason related to sunshine is also involved. Farmers call it *gama.* It is the reverse of shading effect. What happens in the case of *gama* is that even smaller hedges, bushes and herbs, including bunds, could obstruct the cooling effect of air that crops need. This problem occurs especially during hot weather and it could fairly be expected to increase as a result of growing temperature over the years. Accordingly, the nuances of land preparation reveal that it is not only about enhancing soil fertility and moisture absorption and retention but also about adapting to increasing local temperature. Here, land shortage, drought, and increasing temperature are addressed just by a single agricultural practice-land preparation. This reveals how complex even a seemingly simple adaptive behavior could agriculturally and ecologically be.

Table 9: Major crops grown and frequency of plowing for their land preparation

Crop name	Plowing frequency including planting			
	1889-1913	1914-1974	1974-1992	1992-Todate
Teff	X	XX	XXX	XX/X
Wheat	X	XX	XXX	XX/X
Barely	X	XX	XXX	XX/X
Oat	X	XX	XXX	XX/X
Pulses	X	X	X	X
Red	X	XX	XXX	XX
Maize	X	XX	XXX	XX

Source: My ethnographic data

The table roughly suggests that land preparation has been quite a historical process. While these historical accounts need to be taken with care since the different periods are more of analytic rather than actual segregations, nevertheless the approach is helpful to figure out the historical processes and trends that have been occurring at least over the last one century. The frequency of land preparation for crops that require fertile land such as wheat has come increasing from one to three and then roughly over the last decade it seems to be taking a decreasing trend. According to local exegetes, the fertile nature of the land during the earlier periods did not necessitate land preparation at all as the return was very high without it. This interpretation is also supported by the condition that land was quite ample during those times. Also, based on political ecological analysis the traditional simple way of life and less market demand which, largely, if not fully, encouraged subsistence-oriented agriculture could be mentioned as additional factors.

The frequency increase reconstructed for the second period is likely to have started at any moment even towards the end of the first period. Regardless, it is very likely to have been caused by such factors as growing soil infertility, increased drought and ensuing diminishing return. Pulses, which never needed land preparation except a rough plowing at planting and did very well on infertile rather than fertile land (except beans), have come all the way unchanged.

One of the local explanations for the growing soil infertility over these historical periods is the repeated number of plowing during land preparation. The introduction of such crops as teff during the periods of Haile Selassie I and the expansion of wheat cultivation since the *dergue* period has exacerbated the need for intensive land preparation. With this change, farmers in Gäddärro noted that the number of land covered with sorghum has come decreasing, further exposing the land to erosion as awn crops are physically

weak to protect the land. Currently, the trend towards a reduced number of plowing in land preparation, in spite of continuous pressure from experts, could be regarded as a reemerging local soil fertility maintenance strategy.

We already saw that farmers do not generally follow expertise advice to plant as soon as it rained. First, unless the rains are adequate there will not be enough moisture. Second, if the rains have not precipitated well, a toxic miasmic gas called *k'ïrïn* or *tïnïfagän* or *fulalot* is emitted from the land which is a health hazard both to the persons and the oxen involved in plowing. Not only plowing, but other agricultural activities will also be suspended if it is believed that there is a risk of *k'ïrn*. When there is *k'ïrn* animals might not be let out of their *gat'a* (stall). However, I had observed a number of farmers starting planting right after the first rain/s and this might be taken as a sign that local practice is starting to breakaway with tradition even though cooler moments of the day might be preferred. Of course, many farmers chose cloudy hours to mitigate the problem but the move away from the old practice is a coping strategy against increasing drought and moisture stress over the years. I had discerned that this local theory contradicted with another *"ïndäzännäbä zïra ïndädäräsä bïla" that* is *"sow as soon as it rains, eat as soon as it is ripe"*. This is one among several instances in which local ecological knowledge is challenged not only by government agricultural extension services but by ecology itself.

According to one of my key informants from Awraççа, the above idiom was not known to people of the long past as the rains were reliable and there was no worry of missing them. Nonetheless, he thought, the idiom was invented as the climate started to be changing through time and the condition of the rains became less and less reliable. Historically, planting time was not regarded as a sensitive issue as it is today. According to local exegesis, the growing concern over planting time has started with changes in the local climate reflected in decreased and mistimed rainfall, drought, and increasing temperature. All of

these mean that planting with care and sensitivity should be a matter of survival. The adage, as my informant said, is most probably a phenomenon of the recent past, coined to reflect on the growing precariousness of the climate which rendered agriculture riskier.

Local knowledge regarding *k'ïrn* is comparable with that of experts. In the recently introduced technology of composting, farmers are advised by experts not to work on it during strong sunshine. This is recommended to prevent the negative health effect from the chemical methane released by fermenting composts. Like local knowledge has it for *k'ïrïn,* the problem happens when the smoke is inhaled. In one of the farmers training I attended at the research site, participants complained many individuals fell ill from this problem for lack of information or lack of seriousness to take the preventive measure. The understanding of both parties show conjuncture between local and scientific knowledge. That farmers were unable to immediately extend their prior knowledge of *k'ïrïn* into that of composting reveals some limitation about the immediate transferability of TEK from one context to another. It is also an indication of local knowledge failing to grasp the changing processes of the environment itself, perhaps until after the change is experienced for long in their direct engagement with the environment. This finding adds on those already considered that consciousness alone is not sufficient to grasp the complex and interwoven dynamics of the farmer-nature relationship.

Experts' advice to start planting as soon as it rained, in a way, is a failure to extend prior scientific knowledge of the danger of methane into the danger of early plowing. The management of extension services which is also based on the principles of traditional hierarchical organizational structure stretching from top to down, where the lower officer is thought to always work under the commands of the higher, is very likely to predispose frontline experts to consider farmers as ignorant or unscientific. Therefore, the source of the problem has partly to do with the fundamental rationale upon which

agricultural extension and rural development bureaucracy are based. (The fear of *k'ïrïn* is further discussed in Chapter Eight in relation to planting decisions of farming households with respect to the drought of *bïllagi* 2008). Variations in micro-ecology such as soil type cause some difference in planting time. In general, little Gäddärro plants before Mïsïräta which plants before Bultumo. Lugo land is cooler than Abalo land, which means, the former maintains more moisture than the latter. Abalo land is described as mean because of its shallow topsoil and restrained moisture infiltration and retention.

Traditionally, seeding has been done by broadcasting. Instead of this method, the extension system has introduced the practice of planting in rows, particularly in the case of sorghum and maize to increase productivity per unit of land.[187] Row-planting represents another point of disparity between farmers and experts. Intercropping haricot beans or horse beans between rows of red sorghum and maize fetched poor acceptance as a few experimenting farmers had to tell their experience. In general, however, farmers were not averse to row- planting. On one of the farmers training I attended and in some other occasions, they demanded to have more time to experiment the technique rather than denounce it grossly. According to experts, the crops to be intercropped should not be those competing with one another for soil nutrients and other important resources. For instance, planting red sorghum and maize in one field, which has been the tradition well before experts' arrival, allowed utilizing soil nutrients at different depths. The former consumes deeper nutrients whereas the latter depends on shallower ones. Experts acknowledge that such an efficient management of soil nutrient is useful to the farmers and the ecology as well. Maize, red sorghum, haricot beans, and an indigenous

[187] To this effect, experts said that plans had been developed and given to the FA for implementation in 2009. Farmers were advised that in the practice of row-planting there have to be ridges between every three rows and on a row there have to be smaller ridges every 3-6 meters on top of the optional technique of digging ditch (*duga*). It was optional for farmers to do a structure on the top edge of the land in order to drain flood water into the field along the ridges. It was said that the recommended 0.75 m distances between rows and 0.25 m between seeds in a row has to be strictly observed. It was also said farmers could plant such crops as haricot beans in the empty space between the rows.

cabbage are amongst those traditionally inter-cropped, most of the times. Local experience and knowledge tallies with this scientific knowledge but factors such as labor, economy and norm have prevented its widespread practice. Rarely did I decipher that a field was planted in rows, when it actually was, as the plants were densely spaced. In this regard, a farmer remarked,

> If we plant in rows every plant will be fruitful but what shall we feed our animals? Planting in rows is just for good harvest but the animals will starve. Some farmers planted in rows and got good harvest but their animals were starved. The important things are the animals; you can buy food from the market for humans; it is difficult to buy forages from the market. Again, planting in rows is very tedious. During planting we lack the labor if we do that [planting in rows] unless you have lots of children at home.[188]

From this quotation it is possible to discern the integration between crops and livestock in a way not yet appreciated by experts. What is more, household labor availability and the market impinge on smallhoders' agricultural decision-making and coping strategies to environmental constraints.

The great majority of farmers use traditional seeds because improved seeds are supplied only for certain crops and, as already stated, in inadequate and untimely manner. Nearly 60% of households (7% FHHs) reported using some form of improved seeds during the three years preceding my survey in October 2009. Of the total, 47.6% of the households reported using improved seeds for awn crops (actually wheat) whereas the rest used some other cereals as well. The sources of these seeds were the WDARDO for 80% of the households (reporting using some improved seeds) and Farmers' Service Cooperative for 16% of them. The rest reported using both of these sources in addition to ACSI[189] and private traders in the area. Shortage of supply or not being able to be in the chosen list of the local agricultural office for improved seeds supply were mentioned by more than 14% of the entire households as reasons for not using improved seeds despite their desire. Again, of the total,

[188] Interview transcript
[189] Amhara Credit and Saving Institution

7% of the households said they either lacked money or feared the burden of debt while an equal number of households said they did not need these supplies at all. The rest mentioned such reasons as poor quality of seeds and owning improved seeds already for not using purchased improved seeds during any one of the three years preceding the survey. The finding shows that this scarce resource is largely handled by government and there is election on set criteria to choose the best and reliable farmers to adopt and multiply innovation.

According to my informants, the major factors influencing what crops to plant, when and in what amount are social, economic and ecological. These are size of landholding; soil fertility; availability of seeds; availability of labor and the need to produce staple crops needed for household consumption. In addition, if rain is a bit higher than normal, farmers might generally opt to plant more of awn crops and horse beans, even though it is known that all crops do not need too much of rain. Of course, households who do not have enough labour know that they will be overwhelmed by weeding if they planted more of teff compared to other crops. Therefore, they resort to planting a limited amount of teff commensurate to available household labour. Similarly, the nature of the soil dictates on its own part how much of the land is to be covered by maize, horse beans, field peas or wheat. For instance, as we already saw, maize needs fertile soil for best performance, and does not thrive well on *walka* land since it is susceptible to water-logging which renders it yellowish and stunted. The decision on crop choice is also affected by the need to have *t'ïnk'ïšš* (a sugary sorghum cane) and *ïšät* (green crops consumed after roasting or boiling). (The soil requirements of crops are presented as Appendix 19).

Land preparation and planting are male-dominated, if not exclusively, male responsibilities. The role of women is one of providing support for their husbands. Along with carrying out household reproductive responsibilities

without which male farmers could hardly accomplish agricultural activities, women's role in preserving seeds is of paramount importance. Once harvest is collected, men leave the management of grains in stores to their wives, including the preservation of seeds. There are instances in which seeds of sorghum and maize are selected and separately preserved from grains stored for consumption and sale. In such cases, the risk that seeds are consumed is rare unless there is famine. Therefore, in most of the cases, women preserve seeds from every type of grains harvested whether their men advise them to do so or not. There is a local saying *"wänïd tasammärä sét yasammärä",* to mean *"the contribution of women for the development and well-being of a family is more than that of the men"*. The preservation of seeds by women in this regard could be seen as one of the indicators of the concept contained in this saying. There is a short legend also told around this role of women. Once upon a time, a woman faced shortage of grains and was forced to feed her family the seeds she preserved. Then, planting arrived and worried over what had happened and the enthusiasm of her husband to start planting, it was said, the woman advised the man *"antuyyé, zänïdïro nug näw alu azïmära".*[190] In her stock, the woman had only the oil seed *nug* which was not a staple food and was planted as marginal crop. To escape her dire situation, she was telling her husband that people were saying the coming season was one of this crop and not others. In the dying out planting ritual, women used to be especially well dressed and groomed and accompanied their husbands to the field carrying the seeds and then leading the oxen during the starting of seeding in the major cropping season that is *mähär*.

9.3.2 Crop Protection

Crop protection is an area in which most of the farmers favored science and technology over traditional knowledge and belief. The management of crop and animal pests is one of the serious agronomic concerns of farmers. There is

[190] Field notes

a widespread complaint that since at least the last four or so decades, hosts of pests not known before have been created or introduced. Traditionally, prayers (mostly collective) used to be the key instrument to deal with pests.[191] Of recent, however, there has been a divided heart partly because of the reliance on modern science and technology and partly because of an ongoing religious schism. The beholden of the tradition complain that because of loss of faith in religion and the reliance in scientific knowledge, their prayers are less heard or not heard anymore before God. As this group complains, science and technology have not replaced prayers as a reliable solution, either. Effective chemicals for the different pests that wreck havoc on crops are not yet made available, except for the devastating stock borer, which itself is no more available since 2007. Those in private shops were expired. Apart from this, drugs made available are not supplied on time.

According to Wärräbabbo district agricultural experts, the drug applied on stock borers was no more produced by the concerned foreign companies because it was found no more effective as the pest developed resistance to it. Not many farmers seemed to be convinced by this justification. Therefore, there are many farming households still depending on prayers along with whatever scientific method is made available to them. The groups of farmers in Gäddärro who are researching on Integrated Pest Management (IPM) have not yet innovated and disseminated major research breakthroughs. Just such things as ash and animal urine are applied with limited effectiveness. Currently, as stated before, there is an excessive need for agro-chemicals[192], running against the ecologically viable and recommended principle of IPM.

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[191] When farmers saw some emergent pests upon inspecting their fields, the case was immediately reported to their fellow farmers. Decision was reached soon to hold a collective prayer, towards whose organization resources were drawn. *Çat* was secured, sheep/goat killed and coffee made and the prayer done. They soon saw the pests devastated. This is how the traditional perception of a religious response to a form of land degradation is constructed or reconstructed mostly by the elderly sections of these communities.

[192] On top of the above mentioned traditional pest control mechanisms, use of pesticides are highly preferred pest control mechanisms among these farmers. Pesticides come in different

Plate 18: Farmers displaying maize cobs affected by stock borers in Awraççа

In the earlier section, it is already mentioned that land preparation is one of the local techniques used to deal with the problem of pests. The following is a preliminary analysis of a discussion between farmers and trainers on the relevance of early planting made as soon as the first rains of the season fall to reduce the occurrence and effect of stock borer. The case demonstrates that local knowledge is diversified and the 24 farmers on the training had difficulty

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forms such as dusts, liquid and granule. Pesticides can kill or prevent pests and the management needs proper care in order not to cause harm to human beings, the crops protected and the environment at large. Currently, experts advise farmers to use integrated pest management rather than the application of these chemicals in order to prevent pests. The advantages of the traditional pest control methods are that they do not damage the environment; are cheaper; are technologically appropriate (environmentally friendly); whereas their inability to control large pest infestation in a short time is their (major) disadvantage. Chemicals are effective within a short time of application and it is possible to control many pests by one pesticide. That they require more technical skill; can expose the crop to damage; can cause damage to the environment, including humans and animals, and that less dangerous pests could develop tolerance and get more dangerous and the risk of death to beneficial organisms are among the major disadvantages of chemicals.

reaching consensus on the issue. More than the difference in individual perception and practice, that the participants were drawn from low and highlands of Gäddärro FA, furthered the difference. The two agronomists facilitating the training maintained the scientific position that planting early would help reduce pest infestation and would enhance the yield in the face of unreliable rain and other precarious climatic conditions. Unexpectedly the discussion on the issue got into some argumentation about over-turning planted crops in April and replanting them in May, as has been traditionally practiced by the lowlanders. For the agronomists this was unwise as it wasted seeds and labor (human and animal), on top of exposing the plants to the risk of rain failure and more infestation of stock borer in June.

The highlanders were inclined to accept the position of the agronomists. And the discussion on replanting rather appeared to be an issue between the agronomists and the lowlanders. The lowlanders' perspective was that because of their land and climate, if the crops were sown early in April- which they normally do- and there comes good rains instead of sunlight during the rest of the month, from experience, the planted crop (mostly sorghum) will grow fast to develop heads during June, a month with low precipitation. This lack of adequate moisture will cause the heads to grow smaller and result in low yield. However, if the rain does not come in April except that required for seeding, the crops will follow their normal growth to produce heads not in June but later in July or August, enjoying the major rains of the year to develop large heads filled with robust grains. In this regard, lowlanders seemed to have their own game with nature, a game in which they cannot become completely free from the influence of nature (climate) but at the same time, one in which nature is also manipulated not to exert its full force.

What do lowlanders do in this game, actually? They have made it a custom to lightly plant sorghum in April following the first rains. The act of sowing lightly is a strategy to lessen the risk they would have to run in case there is

the need to overturn and replant the fields. Then, they leave the turn for nature to play its part. If, the rains fall after the fields are sown in that same month, the lowlanders know that the fields will for sure be over-turned and replanted in May. On the other hand, if April shines well after sawing, that will give good chance for the seeds to germinate well and take on a normal growth. In this case, it means that farmers have somehow won the game. If rains continue in the month the fields are planted, this means that the soil will continue to have moisture throughout the month, whose effect will continue to May (to enable this forced re-planting). May is mostly one of sunshine. Replanting, in this regard, is considered to create the ambient condition to harvesting good amount of sorghum. Hence, they will over-turn and replant the fields with normal density of seeds. In this latter case, they know that they have lost seeds and labor on the first planting but have increased the chance of reaping better harvest. On the contrary, if the rain and moisture situations do not necessitate replanting in May, the crops are left as is and cared as much as possible to collect a harvest, though lesser than the other scenario. By so doing, lowlanders avoid the risk of completely losing harvest because of lack of and mistiming of rain and the risk of stock borer. And from long experience cutting across generations, this strategy is generally considered the best to cope with the lowland ecology. Nonetheless, as already said, this adaptive strategy did not carry weight before both the agronomists and the highlanders. Some of the lowlanders insisted politely on the difficulty of accepting the agronomists' advice. The agronomists on their part insisted that was the only advice they could make as experts- science.

In the customary evening discussion I and my assistant used to have, he said that lowlanders traditionally do the aforementioned practices. He did not appear to appreciate their ways, however. He further remarked those farmers were emotionally unhappy overturning the good-looking green plants in the search for a better harvest. He recalled the saying, *"yäwälläduti̇na yäzärrut anïd näw"* to mean, "*That one has begotten and planted are the same"*. Crops

planted on one's hand are like one's own children, who need care and affection. Therefore, my assistant was stressing that lowlanders feel bad when they uproot and dismantle their plants in their tender ages.

The adaptive strategy of survival under discussion is comparable to the practices of the mixed crop-livestock farmers of the Berti of Darfur in the Sudan. The Berti, who live in drier environment than the lowlanders of Gäddärro, are so concerned of the vicissitude of rainfall in their cropping practices. As documented by Ladislav Holy, the Berti establish two fields in their drier environment receiving 200-300 mm of annual rainfall (Holy 1988: 140). Older fields thrive well when the rains are lighter and newer fields do better when the rains are heavy. To cope with this uncontrolled factor of nature, Holy reports that they prepare more fields than they actually need and plant more fields than they could actually weed. Later, based on the performance of the rain, more weeding labor is accorded to one or the other of these fields.

The clash between the economic and the non-economic value of plants (in this case, spiritual) among these Ethiopian lowlanders, culminates with the former taking the upper hand. As such, humans' spiritual responsibility for the plants they grow is rendered secondary to the material responsibility parents owe to their children as their breadwinners. van den Breemer (1992), relying on his earlier works (1984a, 1984b), has documented a comparable situation in Ivory Coast in which "The ideas of the Aouan about the society and its processes predominated over their ideas about the environment" (p. 106). He documented that these people had otherwise refused to accept government advice to start rice sowing on account that "Our Earth does not like rice". Breemer's account suggests that the 'religious' reason not to grow rice "a crop which is more damaging to the environment than any of the existing crops" (p. 106) was ecological. Nonetheless, the otherwise dependent laborers who came to Aouan land to work on coffee and cocoa plantations (who did not find

enough jobs because many of these plantations were getting old) became rich (of course richer than the Aouan themselves) from rice cultivation which gave high and quick economic return. It was to reverse this economic and social betterment of the newcomers, which threatened the Aouan to be followers, that they reverted to rice production, defying its religious proscription. These situations compare with the sustainability challenge at the level of the world system as countries compete for economic and political dominance of global reach to the disregard of their ecological commitments, at times rendering them mere rhetoric.

Weeds are also a form of pests that need to be managed accordingly as they compete with crops for water, nutrients and sunlight. Both for farmers and experts, weeds affect field crops mostly during their tender ages and the objective is to minimize their economic impact rather than remove them completely. Based on this, farmers weed "properly" teff, wheat, barley, and oat fields whereas the weeding, especially of red sorghum, maize and beans is mostly carried out just within the first two months of growth. After that, especially red sorghum and maize fields are left to grow weeds to be harvested as livestock feed during *kïrämït*. During August and partly September 2007, I witnessed all over Gäddärro the harvesting of varieties of weeds mostly from red sorghum, maize and horse beans fields. One day, as farmers were cutting, carrying and feeding animals the weed called *magät',* I asked my guide whether this plant was a weed or a crop. Immediately, he replied it was *haräm,* the Amharic word for weed. To my perception, all the red sorghum, maize and beans fields were infested to their ears with this and other weeds. In Binné, just from a small beans field, I and the owner sampled more than 30 types of weeds within about half an hour. It appeared we did that exhaustively. Except for teff, barley, wheat and oaths fields, where weeds are considered more harmful and weeded out, in the other crop fields, weeds are largely left to thrive (after a certain stage) as animal forage. Some of these weeds such as *magät'* are highly regarded for their nutritive values to

livestock. Therefore, such weeds have two-fold advantages: as sources of forage and as preferable nutritious feeds.

Plate 19: A farmer cutting weeds for livestock from his maize field in Mïsïräta

Normally, weeding in fields of awn crops except teff is not done during *bïllagi*. Farmers' reasoning is that the crops shall overtake and retard the weeds as the former perform much better than the latter on the low precipitation which is 'natural' to the season. Over the last five years, all the same, some farmers have started weeding awn crops as well during *bïllagi* and report better results. Among the possible factors behind this newly emerging practice are land shortage, household food insecurity and extension education, most of all, the philosophy of shifting from extensive to intensive agricultural practices. Therefore, it might only be a matter of time before this practice is rendered a norm.

The nexus between animals and weeds is an example of the redefinition of things in the environment as resources (Cf. Squires, 2004). To some extent, it

also shows the difference between the spatial orientation of farmers and that of the state, based on TEK and WSK, respectively. The first is contextualized and the latter is very general and theoretical founded on the management of western mechanized farming and not traditional smallholder agriculture.

The forgoing does not furnish a detailed description and analysis of the weed management thoughts and practices of farmers. There are many more traditional techniques applied by farmers in addition to the application of pesticides, also for pests other than weeds. Regular maintenance of field sanitation, inter-cropping, planting same crops by farmers cultivating adjacent fields to spread the risk and applying deeper depth during land preparation are all practiced by farmers as are also advised by agricultural development agents and experts. The case of red sorghum and maize is analyzed below to further understand traditional crop pest management under changing circumstances.

A month or so after planting, *šïlïšalo* is performed- plowing fields with tender red sorghum and maize plants. Soon, *çaro* (cultivating the fields with a small pick axe) is carried out. After that, the field is left as is for some part of May and the whole of June. During July and August, according to the status of the crops and the nature of the land, further weeding could be in order or not. Usually, *šïlïšalo* is done in May, both for red sorghum and maize. *Sinaga* (a lighter wooden plowshare) is applied instead of the regular plowshare. The *šïlïšalo* is still deep. It is said that it will help the plants to grow more and decrease the weeds. It is also meant to wilt and kill those corps to be thinned out. Of course, even when the crops are sparsely populated, *šïlïšalo* is done. According to farmers, the land wants that, meaning the crops will thrive better. *Çaro* (a kind of weeding) is carried out immediately after *šïlïšalo*. Red sorghum in some places is weeded by hand after *šïlïšalo*. In July and August, before sorghum crops give fruition, some leaves could be removed in a process called *asana mämïtat,* a task which is dropped if the heads are already

forming, so that they are not removed. Once the plants have started flowering, the leaves are not removed. Physical contact with the plants shall cause the removal of the pollen grains that enable fertilization. After that, the major task is keeping off the birds and clearing the *wurma* (bushes) around the fields. After *šïlïšalo,* red sorghum and maize fields are also tined out. There are farmers who also tin out teff fields during *çaro* to help the plants develop good heads.

If *šïlïšalo* is carried out in May and June and there is no rain, the crops shall wilt for some time. This causes the plants to roll in their ears, preventing rainwater from getting inside, which, otherwise, facilitates the opportunity for the creation of stock borers. Local knowledge is that if there are *kaffia (*that is light misty rains) in these months, the crops are exposed to this pest unless the *šïlïšalo* has been done in advance. Wilting is believed not to be affecting the growth of the crops. It is believed that after some period of hibernation, they recuperate soon when they get some rain *(rïbïrabo)* during the beginning of July. Contrary to this, local knowledge is that the practice speeds up their fruition. This technique spares the need to apply modern pesticides on these crops but it is also applied to optimize scarce moisture in the soil. This indigenous strategy of preventing stock borer, also well accepted by experts, was invented and practiced by highlanders since a long time.

In the long past, maize and red sorghum used to develop cobs in June because they were free from stock borer attack and the rains were assets rather than liabilities. And, even after the emergence of stock borers, farmers say, as experts do, that heavy rains will destroy the eggs inside the ears/stems of the plants, becoming beneficial rather than disadvantageous. Older men said, as already mentioned, that during the earlier times when there were no stock borers, *šïlïšalo* and the wilting of the crops had to do with other purposes. If the plants remained wilted, they do not need much food in these dry months. However, when the stock borer problem arrived, an already existing technique

was reapplied for a rather different purpose before modern drugs were made available. This demonstrates how our repertoire of environmental knowledge could be applied in ways not well perceived in advance (though this might take place times after a new problem has arrived), indicating that we need to be wary about the protection and sustenance of TEK from extinction. The case is also suggestive of how humans' knowledge of the environment is incomplete, including our responses and their impacts. This analysis might entice us to question, "What then could be done to deal with this inherent epistemic deficiency regarding the environment and its uses?" The last chapter deals with this and a number of other issues.

It has been already mentioned in this section that modern pesticides are in high demand among farmers but supply is so low. More than 92% of households had reported using some form of chemical pesticides to treat or protect their field crops during the three years preceding my household survey in October 2009. Of these, nearly 90% of households applied chemicals on red sorghum and maize against stock borers whereas 18.6% and nearly 14% of them did also apply some pesticides on cash crops and pulses, respectively. The use of traditional pest control medicines had been quite insignificant that only six households, who also used the modern ones, reported trying them.

Table 10: Sources of chemical pesticides applied (R=119)

HH types	WARDO*	FSC**	Private traders	WOA & FSC	FSC & Private traders	Total
MHHs	9	58	23	1	6	97
FHHs	4	12	3	0	3	22
Total	13	70	26	1	9	119

Source: My survey, October 2009

*Wärräbabbo Agriculture and Rural Development Office

**Farmers' Service Cooperative

The table should not give the impression that modern pesticides are in high application. None of the sources mentioned are able to supply farmers with drugs timely and adequately. Therefore, chemical fertilizers remain to be the least satisfied demands of smallholders. Accordingly, this remains to be an area where government, NGOs and the for-profit-private sector could be involved. About 14 households have also reported applying these chemicals on stored grains. Indeed, this is not a problem to the great majority of the households since what is harvested is finished off between two and seven months, obviating the need to worry for preservation. Otherwise, increasing local warming has raised crop susceptibility to weevils' attack compared to the long past.

Pests (including weeds) are not the only production problems. A host of other problems are also faced such as drought, shortage of money and shortage of labor in descending order of importance. From the following table, it is possible to assess the weight of pest problem in relation to other production constraints discussed in the qualitative analysis of this dissertation so far.

Table 11: Problems faced by households to improve crop production (R=131)

HH	A[193]	B	C	D	E	F	G	H	I	J	K	L	M
MHH	103	68	74	102	61	45	28	56	24	77	82	61	34
FHH	24	16	12	22	16	9	10	15	7	19	19	13	9
	127	84	86	124	77	54	38	71	31	96	101	74	43

Source: My survey, October 2009

In addition to competing with crops for water, air and other nutrients, weeds can harbor different pests. Of course, some pests prefer to lay their eggs and feed on weeds for some time. Therefore, experts advice that weeding (removing the weeds physically) timely and properly can help reduce pest infestation is persistent. From farmers' point of view, weeds are theoretically

[193] A= pests/diseases; B=Soil erosion/fertility depletion; C=Land shortage; D=drought/shortage of rain; E=lack of draft oxen; F=Shortage of improved seeds; G=Lack of knowledge/awareness; H=Water-logging; I=Shortage of chemical fertilizers; J=Shortage of labor; K=Shortage of money; L=Shortage of drugs; M=Shortage of credit

regarded as enemies of crops though in practice, as already discussed, there is a high degree of tolerance for them. This being within the discourse of traditional crop protection, within the discourse of livestock management, weeds are rather perceived as an important source of feeds, especially during moments when hays and the like are exhausted. Hence, both conceptually and practically, weeds are between environmental risks and benefits. The harvest of *magät* in July, August and September, is an anxiously awaited moment to cope up with the feed gap. Due to historical, economic and other factors, plants termed weeds, both by farmers and agricultural experts, have been transformed into economically beneficial resources. The case demonstrates how practice could deviate from perception and how the same symbolic understanding (of plants as weeds) could cause differing practices. What is more, it can be induced that animals have moved from the mountains and grazing lands onto crop fields with the growing shortages of pasture and other feeds. This could be considered as a shift of land use type without changing the general mix of agriculture as farmers juxtapose or manipulate the spaces around them in ways that befit changes in ecological and other factors. That the nomenclature does not fit the practice could have different probable explanations. It could mean that humans take longer time to linguistically capture changes in the environment. In other words, this might mean that the rate of change in the bio-physical environment is faster than the rate of change in its symbolic representation through languages. If these hypotheses carry weight, it goes that there could be negative and positive environmental changes not yet linguistically captured. It also appears that a certain human environmental behavior is well grasped as a problem when it is captured linguistically. Therefore, it appears that humans might continue degrading their environment as far as degradation as a problem is not captured linguistically. Partly, the emergence of non-indigenous weeds is likely to be an unintended negative consequence of international cooperation or a careless diffusion of ecological problems across different continental spaces and

cultures. Whether the diffusion is conscious or unconscious is immaterial to my analysis here. What is important is that ecological problems, like their solutions, could be transported across geographically separate parts of the world because of the phenomenon of globalization in different forms, in this case trade and international cooperation in agricultural extension and disaster mitigation.

9.3.3 Harvesting, Storage, Seed Selection and Preservation

Bïllagi crops are planted from January through March. Their collection is carried out from May through July. In July, the same land is planted pulses *(t'ïratïré)* to be collected in November. Red sorghum and maize, planted in April, are traditionally harvested after November. Of course, maize matures earlier and is largely consumed green. As a result of this, maize is locally called the crop that never knew the threshing ground. What remained from green consumption and seeds for the next planting is taken home without threshing. When they are ripe the stocks and the heads get dry, red sorghum also becomes black. To preempt bird attack, nowadays, red sorghum is collected earlier with maize before it is dry enough. Teff planted in July is also collected in November before it is dry enough; this time not because of the fear of pests, but because of rain. Rain at this stage shutters the grains in the field. From October through December, there is too much cold and *hurri* (dense fog lasting for weeks).[194]Accordingly, shattered grains in the field could germinate there because of humidity. In other places where this problem is not there, teff is kept in the fields till it is dry enough. In the case of *bïllagi*, since this problem is not there, everywhere the crop is left in the field to get fully dry before it is cut. If the weather allows, leaving teff to dry quite well in the fields involves no risk of harvest loss. In the case of wheat, its cutting, piling and transportation to threshing grounds causes the seeds to shatter if it

[194] It is said during this time the cold weather shrinks even well-fed oxen.

is left to fully dry in the fields. Red sorghum is not risky in this regard but it is collected earlier to preempt pest attack as already stated.

Horse beans could be left in the field until they are quite dry. However, in order to minimize the risk of loss, their collection needs to be made either in the morning or in the evening when the weather is colder. Barley and oats, especially barley, share this quality with horse beans. The loss is serious with horse beans but since it could be picked by hand or by animals, owing to its larger grains, much of the loss can be redeemed. Of course, if horse bean is not left to become fully dry in the field, the beans will go yellowish when piled. Secondly, its threshing will be very difficult, especially if the weather is a bit humid. Piling is usually made on the fields; then transported to threshing grounds. Most of this job is carried out by women and children to some extent. In case piling is done on the field, threshing is also done there. Horse beans are threshed on *iddari* land because there is no need for a well-prepared threshing ground owing to their big grains. Threshing ground preparation for teff and other small-grained crops needs special care such as clearing the surface and smearing it with animal dung. Wind energy is among the principal factors in situating threshing grounds. Farmers prefer a place with good gust of wind to thresh their crops but not all farmers have private threshing grounds. Normally, private ownership does not mean exclusive use and it only gives priority to the owner. Otherwise, threshing grounds are communally used by all villagers. The distance of threshing grounds from the fields and the homes is also taken into consideration. Experts make the opinion that threshing grounds are smaller and not of the standard size, increasing post-harvest loss.[195]

[195] The size or space of threshing grounds is adjusted by the *kazïmia* (a brim of sorghum stocks) in order to reduce the risk of loss in the case of threshing red sorghum. Even though red sorghum and maize are usually intercropped, maize is not mostly threshed for two reasons. In the first place most of it is consumed green before it is fully ripe. Secondly, the amount remaining after this for final harvest is small and simply removed by hand rather than threshed.

Planting is a process that starts from the time of harvesting or even before that, where best performing crops on fields are selected as seeds for the next season. If not before, thus, seeds are selected and kept at harvest. Good appearance, early maturity and large grain size are among the traditional criteria used in selecting seeds. Seeds thus selected need to be kept in dry and safe places. Red sorghum and maize seeds are kept separately from those stored for consumption. Teff, wheat, barley and oat seeds could be simply kept in the traditional silo called *gotära.* When planting arrives, the women simply hand out these seeds to the men. My informants said, in the past, weevils *(näk'äz)* used to attack only maize and red sorghum. Nowadays, because of increased warming, pests attack many other crops including barley and beans. To prevent this, such seeds are also kept with care, including the application of drugs in their containers. Weevil attack goes up and down with the condition of local temperature every year and farmers simply discern this from the food they eat.

Maize and red sorghum have separate preservation methods. The cobs of maize are kept, as in the past, on a raised bed or space under the roof (or overhanging a smoking place) whereas the heads of sorghum are wrapped with dried leaves and stalks of the crop itself. Many farmers still practice these techniques instead of or in addition to applying drugs. Now, to preempt bird attack, many farmers collect red sorghum in October together with maize, before they are dry enough in the field. This had to be carried out in the face of knowledge that the food content (powder) in each grain is reduced and the moisture in the grains exposes them to more risk of attack by weevils.

Plate 20: Traditional maize seed cob preservation over a hearth place in a house in Awraççа

Plate 21: Traditional sorghum seeds preservation in Hulluk'o

It is believed that if the crops were cut during the month of November, a *bäk'k'olït* time, the harvests are to be attacked by termites. According to some of my informants, the *bäk'k'olït* effect, a knowledge received from past generations, is particularly associated with sorghum, red sorghum, wheat, teff and the like crops only. On the other hand, there were some farmers who thought that the problem of *bäk'k'olït* did not exist at all and argued weevils' attack increased with rise in temperature. Others said interpretation depended

on coincidental experience suggesting that it is not true. The case is typical of the difference within TEK of a locality.

Seed preservation is not a concern at all for *bïllagi* planting. As there is only a matter of two months' time between *mähär* harvest and *bïllagi* planting, the seeds will not be exposed to damage and involuntary consumption at home. The concern is for Miazia (April) and *kïrämït* (July and August) planting where these factors are real threats, especially for poor households. Such risk prone households earmark a small portion of their land in *bïllagi* in order to plant crops whose seeds are needed for the coming *kïrämït* planting in the practice called *zär makïrämia.* This practice is apparently logical. Such households, which are afraid that they would consume up their seeds during the lean months, go in favor of planting these crops. In practice, this is keeping their seeds out there in the open field. Seeds preserved as such are threshed with the other major crops of the season. This ensures that the household has enough seeds for the next season. The practice can be taken as an epitome that different farming households have different coping strategies. Secondly, it shows the difficulty farmers had to face in choosing strategies in order to adjust with poor capital and climate change. In this case, the decision could be paradoxical. The decision, *prima facie*, shows that farming households are forced to trust the open-air fields rather than the secure granaries in their homes. Actually, if the weather turns bad and other environmental risks crop up, these households will be at a disadvantage. The case might be seen as a less hostile representation of the tragic environmental conditions farmers are forced to live in.

9.4 Conclusion

The chapter has demonstrated that the cultural understandings of crops and their cultivation are contingent on social, economic, cultural, political and ecological factors. It has documented that custom, market and historical circumstances, including politics, affect local understandings and decisions

regarding each crop in addition to ecology. This is processual and the environmental viability of an agricultural practice is also to be seen in light of this same understanding. For instance, planting without land preparation was once an environmentally and economically viable technique. After a long period, however, due to environmental (natural and social) change, land preparation for seeding was necessitated and had to be practiced till its viability had to be questioned once more. Among others, the depletion of the vegetative environment is a major factor in rendering the same practice doubtful. This demonstrates that the concept of environmentally sustainable resource use is so complex and it is less about the natural environment than it is about human beings dealing with this environment. This is among the major reasons that render sustainable use of resources quite a challenge at all levels of spatial, economic and political organization.

It is also possible to learn from the chapter that the cultures of traditional societies are not necessarily averse to western science. And the relation between the two models is not only one of contradiction but also of cooperation. Of course, some cultural practices might facilitate the dissemination and adoption of science and technology than retard it. And traditional communities could opt to denounce their age-old environmental responses in favor of a scientific practice which science itself at some point might brand as environmentally non-viable. Some of the contexts in which western science works are also those in which traditional ecological knowledge does. There seem to be instances in which changes in ecological contexts instigated changes in traditional knowledge in the same way as in western science. The chapter also shows that culture might prevent, inhibit, or delay an environmental response as it does promote it. There are hence important convergences and divergences between the two models of knowledge. In this regard, the findings entice us into thinking that western science is no less belief than what traditional ecological knowledge is. Interestingly, the chapter has discovered contradiction within TEK itself

among people of a locality, against the literature that has been focusing on the difference between TEK and WSK alone. The findings strongly corroborate the approach that composite theorization guarantees a better understanding of crops and smallholders' environmental relations and the changes thereof, whether degenerative or developmental.

CHAPTER TEN: HORTICULTURAL CROPS, TREES AND FARMING

10.1 Introduction

One purpose of this chapter is to demonstrate how the forces of tradition, politics and the market environment have worked to depress the cultivation and consumption of horticultural crops such as fruits and vegetables. I dwell on farmers' focus on culturally accepted food crops rather than old and recently introduced horticultural crops until changes in politics, the market and the ecology have necessitated the acceptance of these same crops by many rural households. Secondly, by taking the case of two horticultural tree-crops namely, orange and the mild-stimulant *çat*, I demonstrate how these specific crops have been able to stand out as important adaptive strategies to combat land degradation and shortage by rural households. Moreover, based on the uptake of the production of some recently introduced vegetables by some farming households, I describe the beginning of a break with the tradition that inhibited their production.

Rival observes, "While much anthropological writing deals with animals, landscapes and domesticated crops, very little concerns tree *per se.* However, trees provide some of the most visible and potent symbols of social process and collective identity" (Rival 1998: 1). Though there has been much change since she wrote this, the improvement is still late in the face of the indispensable role of trees in the life of humans. Durkheim regarded tree symbolism as a possible reflection of a human urge to express ideas through the help of the external material world (Durkheim 1976 [1915], p. 125, as cited in Rival, 1998, p. 1). Notwithstanding the relevance of this, Rival indicates a shortcoming in the focus on the material to express the social and the ideal, arguing that in material cultural studies things are regarded as "object-like" whereas "the physical presence of a tree is not that of an artifact; a tree is a living organism" (Rival, 1998, p. 2). Based on Douglas's notion of

natural symbols (1970) that emphasizes the "dual nature of humankind as both animal-like (the body) and god-like (the mind), Rival devalues the pre-Levi-Straussian theories of totemism which "emphases the polarity between residual, biological animality and developing humanity" (Rival, 1998, p. 2). Along these lines, the conception of trees as organisms, their social and spiritual lives with living and dead persons are among the objectives of this chapter.

I also discuss the economic and ecological valuation of trees in relation to other components of the environment namely, crops and livestock. Along each one of these lines, trees are evaluated as beneficial or harmful to smallhoders in different respects. Owing to human and natural factors, the cultural notions of trees have undergone important changes over the years. Scientifically, trees have a number of characteristic features. These are, among others, moisture absorption; acidity; contribution to soil fertility (leaf foliage, etc.); contribution to erosion control; level of integration with crops; level of integration with animals (forage, etc.); economic value (forage, cash crop, construction, fuel wood) and rooting (deep roots, shallow roots). This is knowledge held by agricultural extension agents in the research area and also of the experts at large. Based on extended interviews and discussions with farmers in the field, I show how these same knowledge pools were in many respects possessed by farmers before agricultural extension education and advice reached them. I document these local theoretical and experiential knowledge sets as factors affecting management of trees and plants in general, mostly in relation to crops and livestock. By so doing, I further the main theoretical thrust of the dissertation that smallholders' culture and praxis about environmental opportunities and constraints are affected by diversified internal and external factors.

10.2 Horticultural Crops and Farming

10.2.1 Socioeconomic Values and Meanings of Horticultural Crops

Tïrïnïgo and lemons used to be the traditionally grown fruits in Wärräbabbo, including Gäddärro. During the feudal period of Haile Selassie I, these and some other fruits were grown only by some households and were primarily meant for children. They were not marketed at all.[196] Today, *tïrïnïgo* trees are scarce while the number of orange and some other fruit trees, introduced recently, are superior in numbers. The mild-stimulant tree crop *çat* was also introduced during the same regime into this district. From the side of spices or vegetables, garlic and peppers were the ones traditionally grown by many farming households. Onions, which are still in small production in Gäddärro, were not grown for long in the past because of the fear that their consumption caused a skin disease locally called *ğuzan.* A local variety of cabbage is grown by women to some extent. The tuber crops tomato, potato and sweet potato were introduced towards the end of the feudal regime and remain marginal both in terms of production and consumption. Generally speaking, not many horticultural crops were grown in the traditional farming system. Therefore, they fetched the minimal value both as food and cash crops which they still do despite some improvement. Local perception of fruits, vegetables and spices has been largely unsupportive of their increased production.

Among others, the precedence given to *ïnğära*, bread, porridge, *nïrfo* or *k'olo,* all dominant within local cultural schemata of foodstuff, has prevented horticultural crops from being regarded as important food items. Lack of market and their perishable quality, despite some improvement, are still among the factors inhibiting the buildup of positive attitude for some of these crops. What is more, the local market for fruits and vegetables continued to be very weak until about five years ago. In the long past, there were times in

[196] This is not special about fruits as many other agricultural products such as milk started to be sold in many parts of Ethiopia only some three to four decades ago.

which orange fruits and *çat* had to be dumped at market places because of lack of buyers. Even today, the market for these products is not adequate and sustainable despite their improvement. Again, farmers do not have direct access to sell their produce to wholesale traders. They sell them to middlemen and retailers who take a considerable part of the profit margin, yet with very little value added input. Generally speaking, the production of horticulture in the district is still to be rudimentary. The government extension service which itself is not strong has been biased in favor of mid-highland and high-land parts of the district. What is more, oranges grown in the district have taste problem (soar taste or not much sweet) and bear too much seeds instead of flesh and juice, affecting their quality.

The ruling classes of feudal Ethiopia were largely carnivorous save on fasting days (Merid, 1984). In as much as the peasantry were the suppliers of the food needed by the ruling classes, their administrative staff and soldiers, this had meant that they were free from the political pressure to grow horticultural crops. Perhaps the hope plant was an exception as the nearly-all-time-consumed local drink, *t'ala* and the royal drink *t'äğ* were made from it, among other ingredients. What is more, lack of seeds or seedlings to start with or the late and limited importation of horticultural crops from the other worlds were very likely to have contributed to the low regard and cultivation of these crops in Gäddärro and the country at large, even though some of the crops grown have been there in the country for some centuries. The cultivation and household consumption of some fruits, which were introduced quite early such as papaya from India and grapes through Jesuit missionaries (Merid, 1984) do not appear to have enjoyed widespread prevalence in the farming and food system of Ethiopians. Currently, the Wärräbabbo District Agriculture and Rural Development Office, has the following activities: temperate fruit development; lowland fruit development; coffee development, as well as vegetables and spices development. These activities run under the following constraints: scarcity of improved varieties; lack of adequate care

and treatment on the part of farmers and the government extension system; post-harvest loss due to inconvenient road and transportation system; problem of properly packing harvest as this is simply done in a traditional manner; problem of moisture stress; and lack of attitude that considers horticulture as a job in its own right.

No other text I was able to collect in the field expressed the force of culture aptly with regard to horticultural crops such as that I heard from a farmer in Mïsïräta. Amidst our discussion about vegetables, he remarked, "What good is there in it when you cannot make either *ïnğära* or *k'olo* out of it?"[197] In the previous chapter, I discussed that *ïnğära* is the staple foodstuff and *k'olo* and *nïrfo*, among others, are consumed primarily as supplementary foods. As a result of this, and the habit of eating *ïnğära* without much spices, the place of vegetables and spices appear immaterial in the local knowledge of foodstuffs and eating habits. Of course, the cultural understanding for vegetables as food is still low and they are considered as marginally useful if not useless.[198] Once, I saw four big mature pumpkins abandoned in a farmland after the harvests of sorghum and maize were collected in Mïsïräta. Those around commented that the farmer, whom I knew well, left them there as he did not have a wife who could cook them for him. Then, I asked the person himself and I learnt that he was not interested in them as food and was contemplating selling them in the market. In that dry season, leaving them unprotected in the field gave the impression that they were not valued at all.

As the above quotation shows, vegetables are compared with staples such as red sorghum or sorghum in comparison with which they appear inferior. To many farmers, it appears a joke that they would be able to feed their families from vegetable production. For these reasons, the government extension

[197] Field notes
[198] Even though there are some regional differences, the widespread Amharic saying, *"ïhïl k'ït'ïl ayïl",* made to make the remark that it is difficult to judge a stuff of food as something eatable or not eatable, to mean it is tasteless and of very poor quality, is suggestive of cereals as food and leafy vegetables as non-food.

system has chosen to focus on women, the youth and the old in the extension of vegetable production as agriculture in 'proper sense of the term' is dominated by men. Yet the low cultural regard for vegetables and spices seems to be widespread. The historian, Merid W. Aregay, said, "the traditional Ethiopian foods never seem to have needed sweetening flavours. This was the reason why sugar was never produced and why little care was given to fruit trees, potherbs and vegetables". (1984, p. 339). The current government has been working to change the negative cultural perception by introducing new fruits and vegetables into the area while some farmers have started focusing on garlic and onions to some extent from the vegetables and oranges and *çat* from the tree crops.

In 2008, small pieces of mango fruits, introduced about a decade earlier, were sold for ETB 1 each and that was received as a remarkable achievement by the local communities. Some enterprising farmers, who could be called early adopters of technology, are getting increased income from sale of vegetables. All the same, cultural constraints still prevent the incorporation of many horticultural crops as an important part of farming and local dietary systems. Only oranges and *çat* could be considered as exception from tree crops. While more households are growing garlic and onions, a smaller number grow tomatoes, carrots and some others. While more of the oranges in the district are grown in the lowlands, some mid-highlanders, as do my research communities, also grow more of this fruit since recently. Unmistakably, the culture and the market have been quite favorable to the mild-stimulant crop *çat.* Its use as a consciousness modifying (and not consciousness altering) mild-stimulant is pervasive, especially among men. And across the board, it is central in social and religious occasions. The sales of orange and *çat* fetch in thousands to many farming households, resulting in unprecedented best practices of traditional commercial farming in their history. Farming households collecting as much as 10,000 birr from a season's sale of *çat* are coming up even in Gäddärro, otherwise not known as a traditionally major *çat*

growing place in the district. Somewhere else in the district, a farmer was an object of local news for some time for collecting about 60,000 birr from the sale of the same crop at a time. Another farming household reportedly fetched 80,000 birr from a year's harvest of orange fruits.

According to my household survey, in 2008/9, nearly 42% of the farming households (12.72% FHHs) had planted some perennial crops. On average, 276 seedlings of *çat*; 12 of orange; 12 of Casmir; nearly 12 of coffee, six of hope; nearly five of mango and nearly three of tangerine seedlings were planted by these 55 households in the three ethnographic villages I studied. The highest number of seedlings planted was for *çat* which was 2000 and the second highest for orange at 250 seedlings whereas the third highest was for Casmir at 80 seedlings. The lowest was for tangerine at four seedlings per household. In general, *çat* is the first perennial crop widely grown followed by orange, coffee and the hope plant. From among the recently introduced fruit trees, apple is the widely grown followed by guava, avocado and Casmir. Most of these newer fruits have not yet started giving harvest. In the lowlands, mango is the wiädely produced fruit from the newly introduced ones. The district of Wärrababbo is the first from among the rest of the districts in South Wello zone for orange and *çat* production, serving as the primary supplier of these produces to the zonal markets and the neighbouring Tigray Regional State. (See Appendix 20 for horticultural tree crops planting in the ethnographic villages).

10.2.2 Fruit Trees

Tïrïnïgo and lemon from the citrons were said to have been the traditionally grown fruits in the district, probably explaining why they are also the richest in ritual and symbolic meanings. Yet these two fruits have been marginalized by newcomers such as orange and mango in present-day Wärräbabbo. Oral history has it that orange trees in the district were grown for the first time in Bulbulo, Däyyé, 18 and 19 FAs on the fertile and irrigated land tracts that

belonged to Emperor Haile Selassie I. There were traditional nurseries on these sites and some farmers, without the knowledge of those who managed these orchards, were able to get some seedlings from there. They thus became the first farmers to grow this fruit. Avocado and mango currently grown in the district were introduced by the local NGO called Water Action and farmers themselves who got the seeds from other places out of the district. According to the WDARDO horticultural expert, the following lowland fruits are grown in the district, including mid-highland and highland agro-ecologies to some extent. These are, in terms of descending order of land coverage: orange, tangerine, guava, banana, papaya, lemon, mango, avocado, *tïrïnïgo*, Casmir and bull-heart).

The highland fruits grown in the district in the same order are apple, peach, plum and pear. Improved (hybrid) apples and pears were first introduced into the district in 1988/9. At that time the seedlings were distributed to four farmers by the Ethiopian Red Cross Society. As there was no extension education made with the seedlings given out, farmers planted them not on properly prepared land. Again, since 2002/3, improved apple varieties bought from farmers in Chencha district (south Ethiopia) by WDARDO have been distributed to many farmers in the district. A seedling was bought for 50 birr by a budget secured from the on-going food security project. Overall, 11,450 seedlings were thus purchased and distributed to farmers from 2002/3 to 2008/9 (District horticultural expert, 2009). Some of these apple seedlings were distributed freely while the rest were sold on cash at subsidized costs of ETB 4-9 per a seedling. Recipients were farmers in *däga* and *wäina däga* FAs in the district, including Gäddärro.

Presently, the district has established one nursery at Gubbisa on a half hectare of land. This is the only highland fruit nursery established in the district in 2006/7. The cost of unskilled labor to run the nursery was covered by the district ARDO in the beginning. Since 2007/8, this expense has been covered

by grain payment from WFP. The mother trees for resource establishment were brought by SIDA Amhara Rural Development Project. Apple and plum seedlings developed on this nursery are being sold out to farmers. According to the district horticultural expert, one of the major problems that horticultural extension has been facing in the district is that after receiving trainings farmers remain unmotivated to develop their own nurseries.

Of all fruits, oranges are most affected by pests and diseases. Rot roots and scale insects damage the roots of the trees. These diseases are major causes of significant harvest loss. Mango trees are mostly affected by the fungal disease, powdery mildew, which is also a cause of high harvest loss. Beetles also affect this crop by sucking on its pollens. Apple is also mildly affected by the disease known as apple spot. The WARDO or other parties have not yet provided farmers with drugs or other solutions to deal with these fruit pests and diseases. On the treatment of apple disease the office sent samples for investigation to the Kombolcha plant clinic which sent back the findings with recommended chemicals. All the same, since their costs were found to be very high, the office was unable to make them accessible to farmers. Therefore, experts' advice to farmers was to make use of traditional medicines, including field sanitation practices, to mitigate these problems. On training and other collective occasions farmers share their experiences to one another with the hope that better strategies are identified.

Plate 22: Women selling fruits at Goha Hamusit market

If the land is fertile, oranges and some other fruits do not give good produce, they will face problem of overgrowth. Rather, such fruit crops would provide high amounts of yields on infertile *(allïççа)* land. As a result, the expansion of the production of such fruits could be applied as a strategy to mitigate soil fertility depletion. In general, water-logging lands are not chosen for orange and related fruit trees cultivation. This also means that suchlike tree crops are not only suitable for less fertile and sandy lands, but also for moisture-stressed ecology. As far as improved extension education and inputs are provided to farmers, in addition to improved market outlets, orange production is likely to be increased as a local strategy of coping with land degradation and drought.

10.2.3 Garden Vegetables

Vegetables do not fare better because of the factors already mentioned. Otherwise, both experts and farmers agree that their expanded production could serve as an important source of household food security and cash, with

some additional efforts aimed at improving their marketing. Amongst the new vegetables introduced by government over the years is cassava *(buri).* This root crop has multiple advantages, especially in the face of impoverished and drought-prone circumstances. Cassava does not need much care as do other crops. It does not need much water and hence it is drought-resistant. A single cassava plant could feed a family of five for a month. It is possible to harvest the ripe ones and leave the rest to mature in the ground. According to the district horticultural experts, the sour variety can stay fresh in the soil for 6 months whereas the sweat variety can stay for two years. It could give harvest within 9 or 12 months depending on the variety. In the face of formidable pest problem, cassava is not attacked by burrowing beasts such as porcupines. My informants stressed that children like eating cassava food provided that it is mixed with wheat flour, in which case, it could also help save on cereals and other staples. The only negative attributes of this newly introduced crop are that its preparation and cooking are tedious (which need prolonged exposure to sunlight and heat). The more than 70 farmers attending a training course in Gäddärro could but get amazed hearing from an expert that *fafa* and other flour meals which saved the lives of many child and adult victims of the notorious 1984-5 famine were made from cassava. Nonetheless, because of cultural reasons, it was unanimously stressed by the participating farmers that it was difficult to consume cassava as an important dish till it was adapted through a long time. While the participants of the training were generally reluctant in having it as a basic food, it was agreed that the cultivation of this root crop should be expanded in the district. The cultural challenge however is very likely to be formidable and their hesitation is principally to be thus explained.

Garlic and onions are produced as marginal crops in Gäddärro even though it seems many farmers have started focusing on these crops at the district level. Tuber crops namely cassava, sweet potato and potato are produced in the district through irrigation and harvested rainwater. Farmers used to receive

vegetable seeds freely as part of the government agricultural extension services. Recently, however, they have been required to purchase them from WDARDO through multi-purpose farmers' cooperatives. The problem is that most of the farmers are not willing to purchase these inputs and want to get them free as before. According to the new strategy, several quintals of vegetable seeds purchased from a food security project finance were given to multipurpose farmers' service cooperatives (at Goha, Fitto, Gubbisa, Däyye, Dubbäta, Hara and Bulbulo) in 2007/8 but none of them has been purchased so far primarily for the just mentioned reason. Some of the seeds cost up to 100 birr per a kilo gram. It was known that the expiry dates of these seeds were approaching and there was no scheme as yet in 2009 to prevent this impending damage. Of course, as already stated, the cultural understanding of vegetables is still very unsupportive of their widespread production, consumption and sales. They are always compared with staples such as sorghum in front of which they appear very inferior. As already stated, government focus has been rather on women, the youth and the old to expand vegetables production as men's priorities are set to the staple crops.

10.2.4 Spices

Many spices and herbs were grown in the country during the 16th century as reported by Jesuit missionaries (Merid, 1984). Among others, were "ginger, cardamom, black cumin-seeds, dills, fennels, coriander, cresses, lettuce, onions and garlic" (Merid 1984: 337). In the face of this, Merid regretted that such lucrative spices as cinnamon, cloves and nutmegs were not produced in the country preventing it from the fortunes derived from these plants by countries like Indonesia, India and Portuguese. Today, more numbers of spices are grown in the country at large and a number of them in the district of Wärräbabbo, including the communities of this research. Those grown in Wärräbabbo are coriander stivum *(näçç azmud),* coriander black cumin *(t'ik'ur azmud)*, green pepper *(k'aria)* and fenugreek *(abïš)*. The production of

spices has not received any attention at all in the farming system of the district, including the agricultural extension services. No seeds and extension advice are delivered about spices. Given the increasing market values for spices and their lesser resource requirement, it seems that this is an area wanting government attention.

The ecologies of the district are generally said to be favorable for spice production- spices require less land to grow compared to their higher economic and ecological advantages. On a training occasion, farmers from Gäddärro were asked by experts to give their comparative judgment about the economic benefits of fenugreek and maize. Even though there was the awareness that fenugreek had better economic advantage, in practice, this crop was not grown to any significant extent. For instance, as fenugreek could thrive well on residual moisture, the crop could be planted just after cutting maize. The fenugreek thus planted, according to experts, would give harvest without rain before the next planting season. In so doing, they emphasized that farmers could be able to harvest more times from the same unit of land. Nonetheless, primarily due to the said cultural reasons, they do not. Of course, there are many farmers who plant maize after the major *mähär* harvests are collected as I have observed in all of the ethnographic villages and their neighborhoods.

Plate 23: Harvesting garlic in Awraççа (The produce was split into two equal halves among the sharecroppers)

When the weather is beneficial, green maize thus planted is harvested and when not, the leaves and stocks are simply used as forage. This old practice has been on the increase in recent years. In 2009, those who grew maize in this manner were able to harvest green maize, part of which was sold. I was impressed by these progressive farmers but my assistant was quite reluctant. He disapprovingly remarked, *"yännïsaš bäk'k'o'lo ayïnïnnasam näw"*. He was saying that maize crops grown as such were vulnerable to the envy of others, as they stand green, solid and attractive in the generally dry landscape. Accordingly, he said the crops would not do well and if at all they do, their harvest will not be that much blessed from the same problem of others' envy. He recalled what we heard a couple of days ago when the two of us were going uphill to visit the junior secondary school in Gäddärro. Some of the men and women from Gäddärro and neighboring villages passing by, now and again, were appreciating the Gäddärro ecology at the sight of the young,

greening maize and red sorghum crops in the fields. The custom is that onlookers express their good wish at the sight of such crop fields-hence, the saying, “May God let you be your owner’s”. This is a ritual restraint that theirs and others’ envious feelings do not cause damage to the crops.

The case depicts how culture could fetter the promotion of some innovative agricultural practices. As already mentioned, planting maize after the major harvests in October and November is on the increase. During my field observations I counted more than 50 fields or strips of fields belonging to about the same number of farming households in each of my ethnographic villages. I was also told that those households with relatively better amounts of land were the ones who did so in contrast to those who possessed comparatively low amount of land. These households were also said to be those having a relatively large number of livestock or a milking cow and hence the need for more feeds. While the practice is showing an increasing trend, land shortage could persist as an inhibiting factor on top of the threat of the ‘envious eyes’. In view of this, and coming back to the issue of exploiting better spice production within the agricultural ecology constrained by drought, land shortage and soil degradation to some extent, it could take longer time to implement the recommendation of experts satisfactorily. Indeed, those who have already ventured upon growing maize in the interlude dry season, which they call *nïssaš* production as already noted, (which is growing on carryover moisture during the dry season), could be more receptive of spice production on otherwise ‘idle’ agricultural time and space. Therefore, notwithstanding the challenges already mentioned, any programmed transformation in this regard is likely to be successful if it starts with those who have been practicing *nïssaš* cultivation already and moves onto the others.

10.2.5 Stimulants: Coffee, *çat* and the Hope Plant

Wärräbabbo's coffee is famed at regional level for its quality. It is produced organically without application of modern inputs such as chemical fertilizers and drugs as in other places in the country. This is however an opportunity not exploited widely as yet. Existing coffee processing is that of dry washing. According to researchers who studied some coffee growing FAs in the district recently, from the Sirink'a Agricultural Research Institute, rust, a viral disease affecting leaves and CBD,[199] are serious problems affecting coffee production in the district. It was found that farmers did not know these problems or considered their economic effect to be negligible. The WDARDO horticultural expert said that total annual coffee production potential of the district was estimated at 1,170 quintals in 2009. The varieties of the coffee grown in the district, said to be indigenous, are believed to have been introduced from the Harar area in east Ethiopia. Coffee harvest is entirely sold at the local markets in the district. Therefore, the coming to the district of coffee traders in the future is believed to be beneficial to coffee growers as this could link them to national and international markets.

Çat is a mild-stimulant tree crop believed to be in production in the country as early as the thirteenth and fifteenth centuries, according to some historical documents (Trimingham, 1965, as cited in Mulugeta, 2011; Greenway, 1947, as cited in Sebsebe 1984). Though its origin, cultivation and consumption were associated with Muslims, the *çat* sub-culture has expanded across religions and ethnic groups in the whole of the country, especially since the second half of the 20th century, primarily owing to improvement in modern transportation systems which also facilitated its export out of the country.

[199] Coffee Berry Disease

Though the eastern highlands of the country have been known for the intensive cultivation and use of this ritually dominant tree crop, it used to grow wild in many other parts of the country. The Wello province is likely to be among its late adopters. Nonetheless, *çat* is the major perennial tree crop grown in the district of Wärräbabbo, also rendering it the single most cultivator and suppler of the plant to the entire Wello and Tigray areas. Policy wise, it has been given a rather marginalized position as a crop in need of government intervention throughout its entire history to the present. As already noted, the highest ever agricultural incomes collected by Wärräbabbo farmers are from the sales of this crop, followed by oranges in some places. Thus, economically, its importance is not dominant only within the horticultural family but also within the entire farming system of the district. All the same, as already noted for spices, the government agricultural extension systems have never considered the promotion of this crop. Accordingly, the agricultural extension service does not show it even in the least of horticultural crops grown in the district.

During the *dergue* regime, there was a half-hearted and sporadic attempt to compel farmers in east Ethiopia to dismantle their *çat* fields and convert them into the production of the 'more important' food crops, notably cereals. The attempt was unsuccessful. Publicly, there has been a mixed attitude towards the growth, marketing and consumption of this stimulant crop in Ethiopia. Traditionally, Christian highlanders have adopted a negative opinion of it whereas Muslims in some places have been consuming it because of its effects for religious and physical activities, mostly agricultural labor. Some experts I talked to in this district made the opinion that, in general, the negative public opinion towards it owes to the psychosocial problems associated with its use; its perceived non-nutritional value, its appetite depressing effect and some others. These experts also expressed their doubts that consuming this crop unwashed could have a detrimental health effect in the long-run from the

residual DDT sprayed on the tree as part of the cultural practices of growing this crop without expert advice.

Plate 24: Harvesting çat in Absaro

The extension curriculum in the country does not include *çat* so that professionals are trained without the knowledge and skills to promote the production, transportation, storage and marketing of this crop despite its high economic importance for millions of rural and urban households and the government as a source of considerable amounts of revenue and foreign currency. The horticultural expert expressed concern that *çat* might overtake other horticultural crops in the district even though he was hopeful that government priority to be given to the others such as orange (including their marketing) might prevent this from happening. Actually, it was said that in many places *çat* has been competing even with the major food crops such as sorghum and maize. In its history in east Ethiopia, the same concerns have

been expressed as the crop has generally moved from the hills to the plains and from the marginal to the fertile lands (Mulugeta, 2011). Among many reasons that have encouraged its expansion has been its land-saving and drought-resistant qualities in the face of ever-growing land shortage and precipitation problem. These same reasons are in effect in Gäddärro and the rest of Wärräbabbo. The likelihood is that it continues to be so. And it might only be a matter of time before the government embraces *çat* in its agricultural development programs. It is well acknowledged that on the part of farmers *çat* has become a major cash crop. There are farmers receiving from 10,000 to 60,000 birr from an annual sale of this crop at farm gate prices or on the local markets, mostly in Bistima and Haik towns. The cultivation of *çat* and some fruits, especially orange, has practically made land scarcity less of a problem for many farming households in the district. It is also acknowledged that in terms of reducing soil erosion *çat* has made a significant contribution.

The hope plant, an intoxicating ingredient in most of the traditional beer produced in the country, is both wild and cultivated among the communities I studied. This tree plant gives good harvest without human attendance but, relatively speaking, appears to have a widespread existence in the current landscape of my research area. Nowadays, following some division in religious orientation, many villagers refrain from and denounce the intake of alcohol. As a result, hope is held with the highest negative sentiment by a portion of these communities, who are opposed to its production, transportation, sale and use. I have heard of drivers who have become beholden of the new orientation and who do not allow their passengers on board carrying the harvest of hope trees. Of course, I have observed many villagers waiting for commuter buses hide anything that resembled a hope package in order not to miss the buses. Otherwise, the ecology is believed to be one of the best in the country for this stimulant crop. I have seen the best ever hope trees with very long statures as high as three or four meters as well

as large, glistering leaves and deep green bushy plants which I have never seen elsewhere in the country before.

10.3 The Experience of Change from Farmer's Perspective

Mohammed is a farmer in Abïsaro and was tending his vegetables when my research assistant and I approached him one day during the course of my fieldwork. He was growing vegetables through irrigation from a traditional hand-dug well on the edge of one of his fields. As we inspected his private gardens, there were five beds of carrots on them. There was also one empty bed from which onions were already harvested. Tomatoes were growing on another bed. He told us that all the seven beds were covered with carrots, except the one on which the tomatoes were. He expressed a sense of achievement - as was true for the other villagers- when he told us that he sold his earlier carrot harvest, which was 10 *kéša* (equivalent to five quintals) for ETB 1,090 at the nearby market in Bokoksa. He also got ETB 80 from the sale of tomatoes. We learnt that the vegetables were doing for the second time and he was expecting to plant for a third time in a year. He believed it was possible to collect three harvests in a year by irrigating the garden from the hand-dug well which was originally dug for purposes other than irrigation. He told us that the gardens were being watered twice a day and the support of four of his sons, who also went to school, was very crucial. There were some beds not in use yet- he was planning onions or tomatoes for them.

For the last six years he had been growing vegetables and his primary source of seeds was the local agricultural office from which he got them for free. Sometimes he had to buy them himself from the market in Dessie. He made the observation that there were no other farmers doing like him in the area and did not know why. My assistant remarked perhaps people do not have water and enough labor in addition to considering the task very difficult. Watering vegetable gardens twice a day was a difficult job according to many farmers. Mohammed told us that the main reason he focused on carrots was that they

fetched a good price in the market. On top of this, he remarked that women and children liked it most, eating it raw, in a way that suggested the culturally inferior status of vegetables.

We learnt that he was not limited to vegetables. Nowadays, farmers enjoy talking about their innovations and achievements. The change is brought by the practice of giving different incentives to best performing farmers who are officially called 'model farmers' and that of applying the same criteria in selecting villagers for participation in paid public labor, trainings and seminars. We listened to Mohammed tell us about his orchards:

> I have more than ten trees of oranges now but I want to add more of them. This year, I sold the oranges for ETB 1,100, last year for ETB 1,300. Four trees sold wholesale fetched this money. Because my land, as you see it, is sloppy; I want to plant on it more orange trees. Here oranges give just one harvest a year. Now I am planning to do *kïrrït* and dig *gorbia* [pits in the ground] for the seedlings. I am planning to mix gopher hill soils and *fïg* (traditional manure) or composts and animal urine on the trees to be planted. The gopher brings up fertile soil as they burrow and trail inside especially on *çinça* land. We like that; it fertilizes the weak land. They [the gophers] are good to improve *aša* [fallow] land. Once during the time of the emperor a farmer brought a gopher from another place and left it in his *aša* land; another farmer killed the gopher. The owner then killed the killer. The gopher is very important to fertilize the land. Especially they are helpful to soften lands with too much *wïran*. They have so much *bitamin*. Just because the land is in short supply, we disliked them. Otherwise, they are highly needed in *k'olla* [lowland] areas. They turn a land virgin; they develop it. Again we can collect its soils and spread them on such seed beds; that is excellent. I say their advantage outweighs their disadvantage in the *k'olla* area. Here, since we have land shortage their disadvantage outweighs their advantage.[200]

A single orange seedling was sold for ETB 3 in 2007. He said his fellow villagers were also planting orange trees though not as much as he thought they should. He added, *"allämmädut nägär yïčannal":"It is depressing to do something one is not used to"*[201]. This was one of the texts I gathered in the field which revealed the negative impact of culture, inhibiting new innovative

[200] Interview transcript

[201] On his part, this farmer, who is one of the few farmers in the three ethnographic villages to grow vegetables in good proportion and quality, had orange seedlings in three places, including the one in his *çat* orchard.

techniques and the scale up of already existing idiosyncratic best practices to cope with the negative effects of climate change and land degradation.

Mohammed continued commenting on his society further. He recalled that people used to say their place was *däga* (highland) and oranges did not perform there as in *k'olla* (low lands). He regretted they were deceived. Talking of his orange trees standing further from where we were to the back side of his home, he said that the trees were 11 years old but he had just two salable harvests from them. Oranges deliver their first harvest after seven or so years in these areas and many other parts of the country. Nowadays, there has come a grafting technology to make them mature fast and my informant said he has learnt how to do that by himself. He was one of the hardworking, innovative and fast adopting farmers in his community who developed good *çat* orchards and some plants for the recently introduced silkworms even though the latter was a complete failure in terms of getting a market in spite of a successful harvest.

About his *çat* orchard, Mohammed continued,

> I just collected the first harvest from my *çat* orchard. I sold the harvest for birr 1000. I sold it cheap. With this year's harvest I organized a *wädağa* [collective prayer] in my house. Otherwise, I could have sold it for 700 birr. My wife sold the *géšo* trees [hope trees] for 70 birr. There are many trees remaining now. I planted the trees myself. I got the seedlings from a farmer here. It was about 10 years ago. Last year they were cheap and I sold them all for 60 birr. The year before last year my son bought them from me for birr 70. He sold them at a profit in Märsa. They were six *kis* [sacks of about 50 kg]. He got a lot [profit] from them.[202]

Experts stress that in order to change the current slow-going trend there has to be interest on the part of farmers. Once they had this, the technical skills required for seed selection and preparation, developing and transplanting the seedlings, pruning and such other skills were said to be simple as far as farmers received the training. It was also underlined that not every farmer should have these skills. Just some of them could specialize on them and

[202] Interview transcript

provide the services to others in exchange for some form of compensation. In order to get better orange varieties and better income, farmers were strongly encouraged to do this. If practiced, such recommendations do not only improve the economic and disaster resilience capacities of rural households, they do also diversify division of labor, thus rendering local economic organization more reliable. Further to this, they would build on traditional agricultural extension system, which, despite its tremendous historical value, remains in perpetual oblivion because of lack of policy and scholarly concern.

It is interesting to note that the influence of culture that has forced farmers to prefer staple crops to more economically profitable and ecologically feasible crops has also affected government policies to run in favor of these staples as against the others, mostly horticultural crops. That is why more of the institutional setup, budgeting and bureaucratic concerns are placed on these cultural staples. Both farmers and government officials have been operating under the same cultural schemata in this and many other regards. Nonetheless, government strategy is now trying to broaden the scope within which such shared objectives as household food security are to be met by making a new focus on horticultural in addition to the long-standing food crop production. International donor communities such as the Work Bank, WFP and SIDA join hands in the implementation of these objectives.

10.4 Trees and Farming

10.4.1 Spiritual and Symbolic Understandings of Trees

In local taxonomies in Gäddärro the things on Earth are either living or non-living. Trees and all other plants are classified under the category “living”, whereas objects such as stones are non-living. According to this view, all trees and other plants are regarded as creatures with biological needs and according to some, they need human care. In the past, what was meant by human care largely had the sense of refraining from abusing trees, all of which grew on

their own accord. Also, like humans, it is believed that trees have language and do speak. However, only those who know their language can communicate with them. In practice, this means trees are part of the object languages of the general environment from which human beings decipher meaning, as in understanding a problem or predicting the future. Anthropologically, it means trees have symbolic significance. In both cases, the meanings to be derived from them are used to understand other components of the environment such as rain. Trees are also considered social beings capable of interacting with humans.

Some elderly men said trees are linked to the origin of Islam. It is said that when Islam was sent to Prophet Mohamed through the saint Ğibril (Gabriel), the Prophet started preaching the religion in tree shades. According to these same informants, the reason they gather in tree shades now has to do with this tradition. Of course, not only religious meetings are held in tree shades. Traditionally, trees served as courtyards for political assemblies.[203]

It is commonly believed by villagers that trees also give shading to the dead and those growing in graveyards pray *(insikiffar)* for the dead. An organic relationship is assumed between trees and the dead even though this might not be part of the mainline belief system. Some of my informants said these trees are seen as skeletons of the dead. Such trees are also held as the property of the dead. Based on this understanding, there has been a religious proscription on a trespass onto this resource regime. Local residents underlined that this was the main reason trees on graveyards were respected and protected while others were destroyed. Exceptions were only when some trees had to be felled, as I have also observed, to cover the inner casing of the grave *(alhad)* and in times of serious fuel wood scarcity to organize *wädağa.* Apart from this, the proscriptions remained in force and a trespass, besides fines imposed

[203] I had attended several community meetings in tree shades even though most of the government assemblies were called in a meeting hall.

by local administration, is believed to result in some form of divinely punishment. For instance, a mere inclusion of a single stick as a material while building a house from this resource regime is believed to be reason enough to rob that family of happiness in life. It is also believed that if an animal was grazed or served forage grown on graveyards, the animal would fall sick and die. In the case of a cow, it is believed, the wrath could even pass over to those who might drink her milk. This proscription, however, loses force if the forage from such places is legitimately secured through purchase, as is done seasonally, by the decisions of the burial committees of the respective villages. At least part of the proceeds thus collected need to be used in a way that has some religious benefit to the respective community as in maintaining a mosque or erecting one anew. During my fieldwork, I have observed such sales take place a number of times. These are religious prescriptions to annul the proscriptions, allowing the living, legitimate access to resources belonging to the dead.

Even though practices differ from place to place, graveyards, church compounds, and monasteries are sanctuaries of long-surviving indigenous trees and shrubs in many parts of Ethiopia as in Wärräbabbo. A person on an auto ride from Addis Ababa to the research site can hardly miss the deep green bunches of trees along the way to Dessie and beyond to north Ethiopia. The share of such religious forests in the total (remaining) forest coverage of the country is very likely to be significant. In the case of Wärräbabbo district, casual and formal interviews with some staff of the WDARDO revealed that the current forest coverage of the district ranged from a low of 2% to a high of 8%. On my part, I guess about half, if not more, of the forest coverage of the district is borne by these sacred territories.

Local explanation that these trees have survived destruction for so long because of religious proscriptions may appear sound. Its validation, all the same, is difficult if what is happening here is compared with other Muslim

communities in the country. For instance, among the communities of the highlands of Hararghe, where I grew up, worked and later did research, graveyards, especially in some communities, were virtual grazing lands. In the case of Wärräbabbo and the rest of Wello, several propitiatory prayers were and still are organized in tree shades within graveyard compounds, a practice which I did not see in east Ethiopia. These cases suggest that the same religion could be differently employed by the faithful in relation to their environments.

It is helpful to select one or two more aspects of the spiritual relations between humans and trees before finishing this section. There are those who believe that trees have spirits of their own. On the other hand, it is argued that while trees harbor spirits, the spirits originate from human beings. In spite of this difference, the notion that trees host spirits is common. For instance, there is the belief that trees host the spirit called *k'ut'ïb*. Spirits could transfer from humans to trees, for instance, when a religious ceremony is repeatedly organized in the shade of a tree. This could also be so when a spirited person or a sheik had rested there for some time or is buried there. Upon these circumstances, the belief is that spirits, including those which have been hosted by some Godly-chosen persons shall transfer onto those trees.[204]

Another strand of human-tree relations in this regard has to do with God's blessing. Local belief has it that once a blessing comes out from the Kingdom of God, it never goes back. Angels carrying blessings on behalf of God are believed to be troubled by them when they could not find anyone deserving of

[204] For instance, according to one of my key informants, let's say a certain tree grows in front of his home accidentally. When it is big enough, the family might sit in its shade to organize a religious ritual, say, the ritual for the commemoration of a Saint. When this ritual is repeated, that is the coffee making and drinking; the boiling of grain crops and serving them; chewing *çat*, the coffee residue that is disposed under it and the rest of things, through time, the tree will get accustomed to these things as its offerings. Also, the *k'ut'ïb* that has been habituated to the offerings will visit the area demanding them every year. If the *k'ut'ïb* does not find these things, it will go angry and cause some problem on the person, his family or his livestock.

them. Then, based on God's instruction, it is believed, the angles throw these blessings on a forested and ritually clean (*t'uhara)* area. Land receiving these blessings will be most productive even with limited human input. One of my key informants from Awrraça, Bäkär Sämman, remarked, "Where there are *wurïma* [thicket or forest] and big trees, God makes His *hurïmät* [kindness]".[205] Areas covered with trees are believed to be *t'uhara* to receive the *haddiyya* (good things, blessings, gifts) of God. Further to the above, certain trees are received as omens of good and others as omens of bad fortunes. Also, some are regarded as attractions to the jinn while some others served to ward off bad spirits. For instance, the jinn do not want the tree called *bïsanna* whereas they are attracted by the tree called *k'ulk'ual*. Based on the same line of thinking, making one's door silt from *bïsanna* is believed to keep away the jinn. Having this tree in one's compound is thought to protect animals from jinn, too. The fruit tree called *tïrïnïgo* is regarded with the same positive perception. The tree called *fätäk'oma,* on the other hand, is regarded as a source of bad fortune or bad *täfaul* for a religious reason. Therefore, people should not or do not allow it to grow in their homesteads. Neither is it allowed to let its parts enter their homes. The leaves are served to animals, however. This is one of the rarest trees in Gäddärro, probably critically endangered. Similarly, some trees are more valued than others for specific spiritual reasons. Such a conception can be regarded as one of the traditional ways in which the ecological and hence, the agricultural significances of trees are religiously understood. The association of God's blessings with trees/forests and then, agricultural productivity could be taken as a religious understanding of a scientific knowledge.[206]

[205] Field notes

[206] Though not an issue addressed in this research, many people and still some do, used to hang different items of vows on big trees.

At a more personal level, the issue of human-tree relations could be a cause of concern. The dream experienced by my key informant from Bäk'alo who had a dream at which the human-tree relation was reflected so deeply and abstractly could probably yield useful symbolic interpretations of this human-environment relationship. I quote this 'experience' at some length:

> It was to Kämisé that I traveled [with an NGO] for a work tour. Among one of the places we visited in a rural setting, the trees of the past were there intact: *tïd, wanza, wäyra* and many others. In tandem with this, surprisingly, the people who lived in the remote past were also alive. They strolled here and there nude except that they had some rugs to cover their genitals. I asked the others why they did that. They told me that these people were sick and tired of *dunia* [worldly life]; hence they were moving naked if probably they were to die from sunstroke. After I came back here, one day we were having a *wädaja.* That night the *abdal* [village guardian spirit] appeared in my *išara* [dream] and wanted to know about my visit to Kämisé. I told him I took to Kämisé with others and there I saw the old natural forests intact and the old people were also there; but in our place [Gäddärro] we do not have both and that was what has been troubling me. He said to me 'listen, we are the ones called *abdal;* our place to live was on and under [in the shades] the trees; but when the old and big trees were felled, we sought our places in the person of the older people and thus we pushed them to death. This is the answer to the question you were troubled with. Let me make the thing clearer for you. Were the old trees existing, the old people would have also existed; but you cut the trees.' Having told me this, the *abdal* disappeared. I woke up only to realize that I was having a *hïlm* [dream].[207]

Dreams and dream analyses are considered aspects of religious experiences. Their overall symbolic interpretations furnish answers to the puzzles of life. They foretell impending disasters or fortunes. They forecast about crops, about livestock, about the political systems, about friends and about enemies. The possibilities are as infinite as those in waking contexts. And in most cases, they are believed to be true and inform behavior, especially at personal and family levels. Thus, dreams and their interpretations need to be considered as important aspects of TEK and beliefs. Dreams could have meanings that promote empirical and philosophical interests to understand, use, conserve and restore our environments and the resources in them.

The above dream is initiated by a man's practical yet incidental encounter with an environment other than his. From this arises a question in his mind

[207] Field notes

about the life-problem of his society in his environment. This problem, according to this research, has not been adequately answered in the conscious realm of humans' problem-solving endeavors. Thus, it has remained a puzzle that needed to be solved in another way. The dream and its contents could be regarded as humans' unconscious effort to seek a solution to their practical problems. That the man was encountered with a better conserved indigenous forest in an otherwise generally drought-prone and degraded landscape is an epitome of surviving enclaves of better managed natural environments. These are environmental 'cool spots', but their existence and exemplary lessons are stifled by the universalizing tendencies of Ethiopian environmentalism. The person, as a representation of the collective unconscious, is trying to redress its mistakes. Thus, he tries to copy the lesson of the 'cool spots' back home. For the moment, at least, he seems to have found an answer to his puzzle. At a micro-level of analysis of this research, this symbolic explanation subscribes to my observational and historical evidences that there existed improvements within the wide-ranging destructions. At its macro-level of projection, the situation is not different.

The dream compares forest longevity with that of human beings. This is an obvious representation of humans' dependence on nature or natural resources for their wellbeing. Where the environmental base is better conserved, people are, at least potentially, better fed, better dressed and better secure and safer with a better life expectancy. The converse would be true in a degraded and depleted environment as the locality of the person who had the dream. My findings on local discourses of village demography abound with complaints that longevity is increasingly cut short, with fewer older people remaining around.

The *abdal* is considered as an important part of the spiritual world and normally it helped villages rather than harmed them. In this dream, one way of conceiving it is to see it as an embodiment of the forests themselves or the

general natural environment. A wrongly treated environment treats back humans wrongly whereas that held with care is rewarding. Hence, the environment is represented as something humans have important stake in its making. In other words, it means that humans can befriend the environment and they can make an enemy out of it. The option is theirs though decisions might not be simple and straightforward as the subjects of this dissertation reveal. Seen in its entirety, the dream could be also taken as another reaffirmation of one of the conclusions of this research that sustainable environmental resource management is not sufficiently accomplished just by conscious endeavors. In the next section, I analyze the interaction between crops, livestock and trees in rural economy.

10.4.2 Trees, Agriculture and Rural Livelihood

The agricultural, economic or material benefits of both indigenous and exotic trees are diverse, ranging from the kitchen fork used in the home to the implements used in plowing the field and the pitchfork applied on the threshing ground. The plow culture of highland Ethiopia is largely dependent on wooden raw materials. Even though some scarce indigenous trees, once considered irreplaceable, are now being replaced by other indigenous and some exotic trees, in general, trees are still the base of traditional farm implements. Even the implements with metal tips and blades such as spade and the plow have wooden handles. Plastic fibers (released from relief wheat sacks) and woven into ropes to replace the whip and the ploughshare winch, traditionally made from livestock skins or sisal fibers, are as yet insignificant to affect the traditional picture.

What is more, trees have been important sources of fuel for cooking, heating and lighting. In the face of the absence of electricity in rural Ethiopia and the inefficiency of the traditional fireplace and hand-made kerosene lumps, burning wood has been the predominant custom. Construction of rural houses, a need that has multiplied with the rise in population, has exerted

unprecedented pressure on wood resources in Gäddärro as in the entire country.[208] Make-shift structures such as awning, which are customary features of social occasions, compound the demand on tree resources. Coupled with the current construction boom in the country and growing demand for wooden furniture, the economic importance of trees has remarkably grown. In Gäddärro, the sale of split woods, poles, joist and the like are becoming an important source of supplementary income for many rural households in ways that have never been. As I have observed, cottage timber production in which some specialized young men produced timber manually, is emerging as a source of income. Transaction of standing trees among co-villagers as a source of fire wood, forage and construction material cannot be overemphasized.

Plate 25: Women carrying home fuel wood collected from village sources

[208] In here, it is interesting to note that local competition for the prestige that tin-roofed houses bestow has forced many households to demolish their cottages and build the preferred tin-roofed houses instead.

Over the last thirty years or so, though not as important as in the dry months of 2008, tree leaves and branches have served as sources of animal feed. The market transaction made over these commodities during the mentioned drought time was very remarkable as people desperately struggled to save their starved and debilitating animals. It should also be noted that trees are land-saving plants and more drought tolerant than field crops. This has magnified their economic importance in the face of increasing land shortage and inadequate rainfall and drought in the area.[209] (Appendix 21 has the major tree resources used as coping forage).

Plate 26: Livestock feeding on tree branches and leaves in Absaro

Knowledge about their role in controlling or preventing soil erosion (leaves, roots, canopies) existed before the introduction of modern science and technology. In terms of water retention, local knowledge divides trees into

[209] The elderly interpret the growing monetary value of trees, especially eucalyptus, as the revelation of the old prophetic advice: *"He who has not planted eucalyptus and begotten a female child shall repent"*.

those which attract water to the surrounding area and those which use it up. Theoretically, the latter are not preferred, especially with the increasing drought problem in the area. Still on a negative note, trees and bushy vegetations could host birds and beasts that attack crops and animals such as porcupines, hyenas, and apes.[210] Trees' contribution to soil formation and nutrient enrichment is a knowledge held by many farmers, for example, their dropping leaves decay to add humus to the soils. Except for eucalyptus, olive tree, *çat* branches and leaves, which are said to be acidic and hence destructive to the soils, the rest of the tree species in the area are positively valued to recondition soils. As a result, the latter are also used as raw materials in the preparation of composts that are highly preferred to chemical fertilizers for cost and ecological reasons. The simple traditional soil conservation technique of using branch or leaf barriers *(t'ämäk')* to stop a starting rill erosion depended on available wood materials.

The majority of farmers lack the 'scientific knowledge' about how trees contribute to the formation of rains. Generally, the young fared better than the old. Differential access to mass media, including radios and modern education, are major factors in this regard. Some of the men and women I talked to, remarked, "When it gets cloudy, there are dews forming on the trees; and the trees move when they attract the air" in order to substantiate their knowledge that trees/forests are sources of rain. In a woman group discussion in Awraççа, Almaz remarked, *"Zaf tälzänäbäbbät täggätïro binor t'eza inkua ayïnoräwwïm",* [What good has a tree simply standing if it doesn't get rains. It will not produce even dews]. Aren't they standing here now; trees will not make rains".[211] Stating so, the woman was questioning where were the rains? It was the time villagers were desperately in need of the *bïllagi* rains that were never seen again save a day's shower at the beginning of the season.

[210]The saying, *"kassïr wänçiffäña and mïsarrïña": "One axe is better than ten catapults"*is used in order to get rid of birds attacking field crops rather than chasing them with stone throws. Though this saying is common in the lowlands than in the highlands of Gäddärro, the practice supported by it has been conspicuous in the highlands as well.

[211] Field notes

The knowledge of this woman was supported by the rest in the group of eight, save one. This woman reacted, "The reason cool air, rains do not come [here] is shortage of trees".[212] She added that rains were there in Wälläga and Asosa because trees were there. The perception that trees attracted clouds and then rains is at its inception among the older generations.

Plate 27: Eucalyptus trees used as erosion control in Awraççа

There is knowledge that trees and forests are useful in protecting the soil from erosion. Notwithstanding this economic benefit on top of those already mentioned, trees are regarded disadvantageous in other respects. If growing close to fields and the branches are not chopped off, they cause *t'äläš* (shading effect) on the crops around. In this regard, eucalyptus and junipers are reported as the most destructive. The roots and leaves of these trees are also mentioned as serious causes of moisture stress, drying up an entire area and destroying crops and other flora around. African olive, a tree native to

[212] Field notes

Ethiopia and mostly growing in the highlands, is also negatively valued in this respect. All the same, unlike that of eucalyptus, its leaves are highly valued as fodder, especially during dry moments. As far as interaction with the rest of the flora is concerned, undoubtedly, farmers presented eucalyptus as the most greedy and asocial plant.[213] According to local understanding, the rest of the trees could enable soil fertility. Overall, based on the knowledge that trees have negative shading effect on crops, the trees and bushy vegetations should not be allowed to grow in or nearby crop fields. Hence, in local understanding, trees and crops should largely remain spatially segregated. Besides the problem of shading effect, it is already stated that trees are divided into those which deplete the soil and those which enrich its fertility. (Appendix 22 has the major trees and their ecological attributes as understood by farmers).

According to TEK, some trees and shrubs provide clue about a number of agricultural issues. While this belief is said to be on the decrease, I have heard some farmers forecasting the condition of rains and the extent to which specific crops were to do well or not in a forthcoming season. Apart from this, trees have diverse botanical services in local ethno-medicine, including ethno-veterinary and the recently introduced IPM, an experimental project of 24 selected farmers from all the 25 villages in Gäddärro FA, implemented in collaboration with the government extension system. The aesthetic value of trees in compound decoration and general greening of the landscape or scenery beautification is an additional aspect of the local valuation of trees. Perhaps, this aesthetic aspect has ecological and hence agricultural implications. Most of the trees thus built around homesteads reduce soil loss from compounds and backyard gardens.

Currently, the research communities are in a widespread tree planting culture. One of the issues my household survey considered was tree planting behavior. In 2009, 90% of households (16% FHHs) had planted some trees on their

[213] Some likened it with the lords of the feudal times, who amassed the resources for themselves, leaving the broad masses impoverished.

private holdings. Taking just tree planting behavior, without considering how many trees a household planted, more MHHs (92.5%) than FHHs (79%) had planted trees during the year. Eucalyptus was the tree planted most, both in terms of seedlings quantity and number of planting households. Accordingly, 104 households planted 36,118 seedlings on their private holdings.[214] In the same manner, the next trees planted most were forage trees in general which were introduced by government over the years. Thus, 88 households in the three ethnographic villages had planted 11,418 seedlings of various forage trees on farmland bunds, less fertile or land not suitable for crops and around homesteads. The tree planted at a third rate was *Cupressus lucitanica* that is an exotic variety of Juniperus procera locally known as *yafäränǧ t'id*. In this regard, 51 households had planted 1,900 seedlings during the year under consideration.

The planting of trees is largely economically driven -- ecological benefits are secondary or unintentional outcomes. As a result of this and since indigenous trees take a long time to mature and rarely coppice after cutting, most of the households have been engaged in the planting of eucalyptus and forage trees. While this has been the tradition of government, NGO and WFP sponsored tree planting over the decades (eucalyptus accounting for more than 90% of seedlings raised and planted), some farming households have started planting indigenous trees of recent along with eucalyptus and forage trees. In this regard, the indigenous tree planted most during the year was Juniperus procera *(yabäša t'id),* amounting to 805 seedlings. Next was acacia Abyssinica or *gïrar* as it is called in Amharic. On the whole, 24 households had planted 646 seedlings of this plant. African olive or *wäïra* was the third indigenous tree to be planted, involving 24 households and 336 seedlings. (Detailed information

[214] Two varieties are planted in Ethiopia namely, *Eucalyptus globulus* (*näççç bahïr zaf*) and *Eucalyptus camaldulensis* (*k'äyy bahïr zaf*), also known in the country as white and red eucalyptus, respectively.

on household tree planting in the year under consideration, including seedling sources, is presented as Appendix 23).

In addition, nearly 18% of households had some trees planted in their private holdings through paid up public work in the contexts of Productive Safety Net and MERET projects. Survival rate of planted seedlings on land under government holding is said to be very low, sometimes as low as 10%. While those planted on private holdings have better survival chance, many farmers estimated that more than half of planted seedlings do not survive. From my observation on some private plots, planted seedlings have much higher survival rates, especially during the first year after planting. This suggested better care and protection. On the other hand, I have also observed a few private lands on which survival rates of planted seedlings were literally zero. Most of these cases were those in which pasturelands were planted with tree seedlings and then reverted to pastureland once more soon after planting. On the whole, survival rate to maturity is very low justifying the slow rate of re-vegetation of the degraded landscape over the last four decades. My survey had also gone into calculating the total number of young and mature trees each farming household has. It was interesting to note that farmers had fairly good knowledge of the trees they owned or they appeared to be so. This was especially so with those which were already mature and ready for harvesting and those which were coppicing for another harvest. Though precision is far from being appreciated, this numerical affinity with the tree environment-with all its limitation- could yet be fairly taken to reflect the extent to which trees are regarded as beneficial resources.

Out of the entire 132 surveyed households, 95.45% reported having young and mature eucalyptus trees under their holding. The maximum holding per household was 30,000 trees whereas the minimum was two. On average, each farming household had 773 counts of eucalyptus trees. Dividing this by the average number of household members which is 4.77 persons per household,

we get 162 eucalyptus trees per individual. Next to eucalyptus, the other tree largely owned by households is *Cupressus lucitanica* locally known as *yafäräng̈ tïdh* with an average holding of 27.4 counts per household. (Appendix 24 has information on amount of tree ownership per household).

The economic impact of trees predates their domestication. Their use in the construction of houses and farm implements is also quite old. Today, the economic importance of all parts of trees is highly valued. While different trees are valued for their different qualities such as strength and weight, in economic terms, those maturing early are preferred. As a result of this, eucalyptus has been the most preferred and grown trees in Gäddärro and the entire highland Ethiopia. This has been taking place over the years in spite of its ecological demerits known to farmers, the government and scholars alike. Eucalyptus can give the first harvest just within five years and mature logs within about eight to ten years. On the other hand, the growing of indigenous trees is minimal because they take many more years to mature. It is already said that eucalyptus coppices whereas most of the indigenous trees do not. A single eucalyptus can branch into seven or more young offshoots. That was why Sirba Hundé, a man from Misirata, who planted an entire marginal plot of land with white eucalyptus in 2007 and with about 95% survival rate as at 2009 towards the end of my fieldwork, remarked that eucalyptus lets its owner grow as it coppices and multiplies. His young, thriving eucalyptus trees were protected by fencing from human and animal contact and SWC structures. Sirba was among the most appreciated farmers for his perseverance and acceptance of new ways of doing things.

Further explaining the low practice of indigenous tree planting is lack of their seedlings. This, however, needs to be evaluated in the face of those growing wild, mostly in graveyard compounds during the wet season. These resources simply sit there as only a few farmers are interested in them. The knowledge that their economic return is very late to come by, has been the predominant

reason informing behavior. And this has made farmers not to think beyond a period of one generation or so. As a result of this short time horizon, the focus is on immediate return and the best answer to this has been furnished by eucalyptus.

Plate 28: Partial view of Sirba's young and thriving eucalyptus trees with a nearly 100% survival rate (Note the stark difference with the next plate)

Plate 29: Partial view of a patch of field planted with eucalyptus seedlings but turned into a grazing land

In present day Gäddärro and the rest of Wärräbabbo, the sale of trees has become an important source of supplementary income for many rural households. Nearly all tree parts are transacted among villagers and sold out in the markets mostly to town people. For instance, we have already seen how tree branches and leaves are important forage commodities, especially during moments of drought. The place of trees in rural livelihood is increasing over the years and this has been represented by the eucalyptus boom in Gäddärro, the rest of Wärräbabbo and the country at large. Overall, within the three ethnographic villages, 34% of households (5.55% FHHs) reported selling some trees, logs, poles or rafters during the three years preceding the survey. This does not include those who sold leaves, branches and roots of African olive used as traditional incense. The maximum incomes thus derived by households during the three years preceding the survey were ETB 3,000, 750 and 500 in 2009, 2008 and 2007, respectively. In the same order, the average

incomes derived by a single farming household were ETB 343.79, 204.67 and 188.18, respectively. ETB 2, 40 and 30 were the least incomes for these years for a household.

The increase in economic significance of trees is reflected both in terms of households selling them and the amount of income derived. Based on the qualitative data, the average income earned in each year by a household is greater than what many poorly resourced households earned from the sale of crops. Government restriction in mid- and high-land Wärräbabbo on cultivating high slope gradient areas, as in Hat'äti and Addami, has forced over the last three years many farmers to stop growing crops on such lands. Instead, according to the options given by the regulation, nearly all households have planted trees on these farms. Therefore, after some three to seven years, many rural households are going to have more woodlots compared to the present. If this forecast holds, it means more households would be selling more tree and tree products to better support their livelihood, provided that the market condition would improve or would not deteriorate.

As a result of the growth in the economic significance of trees, some rural households have been actively engaged in developing seedlings and planting trees, largely eucalyptus. Economy is the single most important factor in farmer-tree relations, particularly in regard to their planting and attendance. In this regard, its contribution to household food security or, best said, to the reduction of its extent, can hardly be overemphasized. A farmer from Hulluk'o remarked, "Farmers here plant plenty of eucalyptus. This tree is food. Otherwise, there is no farmer who thinks he would change his environment by planting indigenous trees."[215] Material need informs not only the planting of trees and of course that of preferred trees but also the absence of the practice at large. In this line of local analysis, the beginning and the expansion of tree planting is partly, if not largely, the function of its scarcity.

[215] Field notes

The farmer quoted above, in a way that represented his communities at large, added, "Before, the number of population was smaller and the area was also forested. Why does he [a farmer] plant trees? The people of the past did not know planting trees".[216] This, however, should not mean economically driven tree planting is not ecologically beneficial. Contrary to this, the modest improvements in the vegetation cover of the area over the recent past and now are largely borne by this economic pursuit on the part of individual farming households. The exception has been with government and NGO sponsored tree planting where, after a certain period, ecological concerns appear to count as equal or more than economic or agricultural benefits.

10.4.3 The Social Aspects of Trees

The social aspects of trees have already been touched upon in this chapter. This relates well with Rival's (1998) emphasis on the importance of tree as a living organism and their social and symbolic significances which are also considered by Durkheim and others in addition to their material significance. In Gäddärro, the use of trees and sacred groves for religious and non-religious purposes form the most important aspects of their social services. The shades offered by trees in general form the center of religious and social spaces. Places like Mount *Abbäddä Goraw*, situated between Gäddärro and 09 FAs, until a ban was imposed on the institution by the *dergue,* used to be the ground where young men and women from the entire territories involving several farmers associations gathered on scheduled dates for love-making, choice of sexual mate, and display of aggression among young unmarried men, who fought to lure their dream girls. The rituals which were strongly supported by custom until the ban had at times been a cause of casualties and loss of life. The name *Abbäddä Goraw* literally meant *"the mountain that went mad"* and it sounded that it was rightly called so. There have been several such bushy areas that used to serve a similar purpose. The saying,

[216] Field notes

"sadulla yämiyawäganna wädağa yämik'k'ämmät' wïrïma tänïtärïso näw": "He, who, flirts a girl and performs a prayer should have the jungles as his pillows" is a reflection of such social functions of trees and forested spaces. These areas temporarily provided the youth escape from the restrictions of custom into a world of free sexual life and infatuation, though partially constrained by the physical rivalry of young men.

Trees as protection from sunshine and wind are the cool spots in rural settings. To some extent, they are used for the same purpose among town people as well. The exception for rural people is that religious, political and other social gatherings such as storytelling and merrymaking are frequently organized in tree shades. Moreover, for the tired, rural traditional itinerant, their shades are like refreshing restaurants. For the student researcher like me, trees in rural settings afforded all the interview rooms, the chairs and the tables. When I now think of in retrospect my experience in Gäddärro, for the villagers, trees are also their favored spaces where guests and friends are entertained. Some trees are thus protected as shades not only for humans but also for livestock.

Trees and forests are the most frequently applied components of the landscape in what might be called a traditional geographical positioning system. They are helpful physical references to improve one's mazeway. Every moment I thought of my fieldwork, and of course, my research partners, I have hardly missed the tree environment in my mental map, even as I write this very statement. Some places and villages such as *gombéw wäïra* and Šola Gända are named after specific trees as part of the use of these resources in the comprehension of the rest of the environment. Trees are also important boundary markers. Accordingly, they are part and parcel of everyday communication. Trees mean much more to the rural people who have many experiences and attachments with trees as children, as youths, as adults and during old age.

10.4.4 From Natural to Human-Made Trees and Back

The mode of creation is one of the local concepts employed to understand trees. Accordingly, trees growing wild are known as trees planted by God or *wäf arraš,* meaning trees germinating from seeds in avian droppings. In the second category are trees planted by humans or domesticated trees. Bunches of trees, forests, or woody vegetations are known as *dänn*, *wïrïma*, or *çakka.* In everyday language, the latter two terms are used more often than the first, which is the official term for the English "forest". *Zaf* is both the local and official term for a tree. In farmers' conceptualization, all of these older terms: *zaf, dänn*, *wïrïma*, or *çakka* are unconsciously reserved for the first category of trees-wild trees or those planted by God.

Trees planted by humans are recent phenomena of their cultural landscape. Except for some feudal lords and *mïsïläné* (local government representatives), who are mentioned mostly to have introduced the culture of tree planting into Wärräbabbo, smallholders did not plant or domesticate trees. Therefore, the local terms mentioned above have not yet been fully employed to express the second concept of human-made trees. This conceptual lag is seen today after four decades of government and NGO sponsored and self-initiated tree planting culture. Despite this, tree planting has become part of culture though not yet part of tradition as such. As a result, trees planted by humans are called *čïggïñ*, meaning seedlings. This nomenclature is preferred to keep the distinction between the two categories. It is an indirect reference to the condition that such trees are purposefully planted by humans whereas the natural ones grow without human intervention on their own accord. Thus, recently forested areas officially known as *yämähabärät dän* (public forests) are called *čïggïñ* by the public and not *dänn*. From this it is possible to discern that their concept of planted trees as "trees" or "forests" is still under formation. This could be considered as one of the typical examples of the

findings of this research in which already existing cultural notions affect the understanding of newly introduced innovations or products.

Another concept employed closer to creation is origin. All indigenous trees are called *t'ïntawi* or *abbat addär,* implying primitiveness and seniority, respectively. *Wäira, tid, wanza*, *däbäbboša* and *bïsanna* are among the indigenous trees still growing. Trees originating from overseas are known as *mät't'e*, literally newcomers. Forage trees such as sesbania and gravilia, introduced by government as part of its agro-forestry promotion over the years, are also part of this category. Most importantly, however, this category is represented by eucalyptus tree. In farmers' understanding, both the indigenous and the imported trees have their own positive and negative qualities. As already said, indigenous trees mostly take several years to grow and mature, whereas imported trees take lesser. As a result, the latter are much preferred by farmers. There is a fledgling knowledge that indigenous trees need to be protected because they are already endangered. In this regard, local perception is that felling indigenous trees is more offensive than cutting imported ones. Some farmers believe that Ethiopian trees are more adapted to the ecology than those imported and if not protected, depleting indigenous trees could be detrimental to humans and the ecology in the long run. As with most of their religious understandings, this secular knowledge has been short of adequately translating into ecologically beneficial behaviors.

Apart from the concept of mode of creation and origin, local understandings of trees and shrubs abound with other concepts as well. The economic, social, aesthetic, spiritual, biological and ecological aspects are all notions employed by farmers to describe, understand and categorize trees. Along each one of these lines, trees are judged as beneficial or harmful or neutral to humans in different respects.

10.5 Explaining Tree Felling and Deforestation

In the early decades of the 20th century, among the predominant trees in Hulluk'o and the rest of the villages, including Absaro and Awraççа, were *wäïra*, *tïd*, *gïrar*, *säggäd* and *k'urk'ura.* The tree, *kïtïkkïtta,* according to my older informants, was widespread like today's eucalyptus. Another bushy tree, *k'änït't'äffa,* with its hooked thorns, was said to be a real impediment passing through the forested environment. One of the elderly men in Hulluk'o recalled, "The forests were dense. It was not possible to drive animals through them and in fact there were no many livestock here".[217]

As mentioned already, in the long past, all trees grew naturally. People were not used to planting them. It was said tree planting was started in the period of Emperor Haile Selassie I, roughly during the 1940s. As small children, some elders remember that everybody used to cut trees freely. These elderly men recalled that when the number of the people started to increase, clearing the bushes and forests in May was also started. In June, fire was set on the trunks, stumps and roots. These woods used to burn for long there. Then, when *rïbïrabo* (lighter rain) arrived in February; the cleared lands were planted *teff* and barley. These same elders remembered that tree or forest destruction was dramatically intensified in the wake of and during the 1975 Land Reform Proclamation. Incipient land shortage was also started to be felt for the first time during the imperial regime.

10.5.1 Trees versus Crops

Local theories of land degradation have similarities with the orthodox, official and academic theories. Population pressure, shortage of agricultural land, lack of knowledge and poverty are among freely listed by farmers as the causes of tree felling and deforestation. In the past, political instabilities have enticed them to indiscriminate clearing and even vandalizing tree resources. Today,

[217] Interview transcript

the dominant local perception is that there is more vegetation cover compared to the 1990s and the 1970s. Of course, all agree that woody bushes have reduced coverage because of cropland expansion compared to these earlier times while tree coverage has been increasing.

Unlike in the official notion of agro-forestry, forest and crop lands are two different concepts for smallholders in Gäddärro. As mentioned already, the first maintains an implicit buffer zone between the two, rendering them mutually exclusive components of the farming system. It is important to repeat here that this primarily derives from the knowledge that the shades of trees retard the growth of field crops. This thinking has affected farmers' behavior of planting, growing and cutting trees. Once in Binné, I observed a farmer who felled seven indigenous junipers trees because of this reason at a time. Nonetheless, from this case, there also seems to be a certain degree of tolerance on the part of farmers or mismatch between percept and practice. All of the trees felled were grown around a cropland though the felling was made at their youthful age before posing a serious threat to crops. Such a behavior is likely to differ from farmer to farmer based on land holding size, level of care taken and some other factors. All the same, it also suggests an incipient thinking and practice in the spatial re-configuration of the traditional tree-cropland physical arrangement. In this regard, growing land shortage and increasing economic importance of trees appear to carry more weight than the official push towards agro-forestry. The incipient tolerance for trees in relation to field crops is also likely to have intensified the process of de-branching bigger trees and leaving them as poles in order to avoid their shading effect. Their negative impact because of their roots however persists unless the trees are removed from the roots or the roots are dead.

10.5.2 Politics and Tree Management

If it were not for government that controls how rural land is administered, local understanding is that the result would have been a chaotic situation as

co-villagers had to vie and fight for its resources. In societies where extended court cases have been the norm, such a sentiment should be a natural corollary. Based on the different interviews I had made, mostly with the adults, the 1976 E.C. land redistribution and the 1975 Land Reform Proclamation have had their negative effects on tree coverage. Farmers were forced to reconsider their perception of tenure security not only on cropland but also on grazing and tree lands. To preempt the loss of land and their resources from policy change, they had across the board felled and vandalized trees not only under their holdings but also those under public or government tenures.

Similarly, the temporary government breakdown during the 1991 power transition had been a cause of tree destruction across the country, destroying the results of nearly two decades of forest reclamation in programs that involved local communities, the government and the international community, including the UN World Food Program. The images of several mountains adorned by thick masses of tree vegetations were suddenly converted into bold masses of uplands shaven by axes. The same problem has been documented for Nepal where the partial breakdown of government in the 1950s and early 1960s was mentioned as the cause for "the greatest forest destruction" in a place called Thokarpa, east of Kathmandu (Mohat T.B.S. 1985, as cited in Blaikie and Brookfield, 1987).

Lack of tenure security has been repeatedly mentioned by scholars around land and land based resources in Ethiopia, standing out as one of the reasons why Ethiopian farmers fail to adequately conserve their soils and grow trees (Alemneh, 1990). Of course, it is (might be) natural to find farmers discouraged to plant trees where these trees are confiscated by government or individual owners are required to get government permission to cut their trees (Alemneh, 1990). Many writers (e.g. Sisay Asefa and Ahmed, 1997) emphasize of solving tenure insecurity to achieve adequate rehabilitation of

the degraded environment and promote the economy of the country. Therefore, they are after a clear cut policy of private ownership of land and its resources.

In reference to studies made on rehabilitation projects carried out in Hararghe, Gamu Gofa, North Shoa and Wollo by the Red Cross, the Swedish Development Authority and the United Nations World Food Program, Alemneh recalls as evidence that there was no clear awareness on the part of peasants, peasant association leaders and government development technicians as to who owned the trees in the rehabilitated project areas (1990, p. 43). In his report for Wollo, he has documented cases in which farmers were confiscated the trees they planted and grew. He concludes, "Thus, any government policy dealing with the rehabilitation of degraded land or afforestation would be futile unless it defined the individual farmer's role in this effort, and provided him with some security for utilizing his produce" (Alemneh, 1990, p. 44). Today, as we have already seen, in some areas the appropriate place for tree planting is designated by policy as part of the ongoing land use planning of the government. There is less tree ownership ambiguity even though in policy owners still need to report to local governments and need to plant some two or more seedlings in replacement before cutting a tree. Prima facie, this might appear restrictive but its lack of enforcement renders it nearly non-existent. It is difficult to say that ownership security is threatened unless farmers are able to cut down the trees they have planted without the requirement to replace them, even when a strict rule of replacement is envisaged. As Scruton aptly put it, "We need free enterprise, but we also need the rule of the law that limits it" (1993: 8).

10.5.3 Trees, Road Building and Electrification

While having site observation of the Gäräk'äfo Water Action project with the local agent in August 2007, I accidentally saw a number of indigenous acacia trees that were felled and lying on the surface. This scene was on the edge of a

densely forested patch of raised land of a circular appearance. I said the forest land was most likely a graveyard. With an astonished gaze he gave me an approving node. I told him I had already seen three graveyards in the area with dense forests of original or primary appearance, home to old and tall indigenous trees. All such sites were quite distinct in the landscape that it is difficult to miss them even for distant viewers. He told me that the three indigenous trees were felled by Ethiopian Electric Light and Power Authority (EELPA) because the trees stood in their ways. In the area, EELPA's field workers have good reputation for lack of patience to pause and give a second thought before setting their hacksaws to victimize trees. I paused for a moment and completely acknowledged that electricity, especially rural electrification is an essential component of socio-economic development. However, this is unlikely to stop one from squirming and questioning if the organization had the mechanism to plant in place of felled trees or if its field workers do manipulate in their surveys to save some trees.

There were several other indigenous (old and big) trees that had been cut down in the FA and all the way from the district seat to the rural peripheries. Rural access roads made by local labor connect nearly all FAs in the district of Wärräbabbo, as in many others in the country. Despite their badly needed contributions in promoting rural-urban linkages and economic development, those I observed in my research area have the undesired effects of exacerbating denudation, soil erosion and exposing tree roots and their ultimate destruction. The expansion of the gravel road from the district seat Bistima to the eastwardly town of Bokoksa is well remembered by elders. Stressed is the notoriety of bulldozing the "*asïrahullättoču wäïra"*- "the twelve olive trees"-, which used to be the beauty and symbol of the east gate of the small town of Bistima, established five years ahead of the capital city, Addis Ababa. Today, the grace and cooling effect of those indigenous trees are no more. The people who had experienced them and are chanced to survive could but lament their destruction. I tried to imagine the number of trees that have been felled and

will be felled in the same manner across the country, including their social and ecological impacts, even though I have heard that the EEPO grows woodlots to harvest poles, which is an ecological plus by itself. I am not sure if any research has gone into this issue. Therefore, the negative impacts of natural heritage destruction and land degradation are going to be huge unless the situation is properly addressed. Much electrification and road building awaits the country, implemented due also to reasons that have to do with global necessities of economic interdependence.

10.6 Conclusion

Due to cultural, economic, policy and ecological factors food crops, mostly cereals, have remained to be the dominantly produced crops in Ethiopia. The government agricultural extension service, which itself is a recent introduction, has been for long biased in favor of crop production as against the rest. As a result, the production of horticultural and other commodity crops has been depressed and even today the country has not gone far in the production of fruits. The constraints in this regard, according to farmers, were lack of water; low level of awareness on the benefits of fruits; lack of seeds provision; lack of implements; attack by pests and beasts, lack of skills and lack of markets. Experts in the localities and district I studied on their part emphasized occurrence of diseases and pests; lack of improved varieties; perishable nature of fruit crops and harvest loss due to lack of modern equipment.

The chapter has also demonstrated that trees occupy an important place in smallhoders relation to their environment (Cf. Rival, 1998). Thus, their conceptualization and classification as part of the natural process of the environment and their use “as potent symbols of social process and collective identity” is revealed (Rival, 1998, p. 1). In the fledgling Ethiopian environmentalism, to some extent, and decisively in her climate change and land degradation theory, trees and forests are given quite an important place.

For Ethiopian farmers, as in Gäddärro, trees are part of the major natural life-forms, symbolically and materially employed in their attempt to conceive and theorize the interaction between themselves and their natural environments.

In this regard, important changes in local understanding of trees have been documented. Indigenous trees are basically considered natural whereas those imported into the area (from within the country and from abroad), are regarded as human-made. Along with this, the belief is that imported trees need human care whereas the indigenous ones grow naturally. The concept, 'human-made natural', has emerged to refer to the new ones. All the same, ultimately, all trees are considered natural. This perception is likely to have emanated from lack of tree planting for quite a long time in their tradition. Currently, there is an intensive tree planting culture. Unlike in the past, trees have become resources that require investment. Among others, these cultural and behavioral changes are taking place owing to government intervention, international relief assistance as well as deforestation and scarcity of woods which could also be considered as the return impacts of nature.

Trees and bushes are given a somehow ambiguous space in the farming system. On the one hand, they are regarded as damaging to crops because of their shading effect and roots. On the other, their canopies and roots serve to render land firm and reduce soil erosion, promoting crop production. Of course, the roots and leaves of many trees are regarded as good humus to the soil. In the face of this, local knowledge keeps a buffer space between crops and trees. This has been discussed as one of the reasons for tree felling or de-vegetation.

It can be concluded that the spiritual and ritual services of trees have diminished over the years. On the other hand, as the economic value of trees has increased, it appears that the level of environmental degradation is decreasing. This is notwithstanding the possibility that there could be a reverse outcome. Generally, it could be said that the research communities

have gone through two important watersheds in their environmental relations over the last one and a half century. Roughly, the period from the time their ancestors were settled in Gäddärro till after the Italian occupation in the early 1940s, was one in which nature's resilience to human intervention on trees and the rest of the vegetative cover was quite elastic. All the same, the period from the 1950s onwards has been one in which this 'environmental truism' was challenged. Since the 1970s, it has been a matter not only of theory but direct empirical perception that the threshold was passed and nature becomes no more tolerant or resilient to unchecked intervention of humans on trees. During this latter period not only trees but also the rest of the natural resources considered in this dissertation have become non-or less elastic. Along with this, it appears the research communities have degraded trees and the rest of land-based resources since some years ago to an extent it would become ethnocide to degrade them further. The issue could be seen as a problem of incomplete domestication of resources on the part of humans despite thousands of years of agricultural experience.

The deforestation theory in Ethiopia is problematic. Its overall explanation is built around the knowledge that *farmers cut trees* or *farmers use trees*. The true reason, however, has to do with the knowledge that *farmers do not plant or replant trees* or *farmers do not grow trees* or *do not protect planted trees.* The other reason in relation to this has been that not many fast growing trees are available within the traditional pool of tree landraces. Added to this, it should be noted that once cut most of the bigger trees are not viable. Still more, one might wish to add that there has not been proper tree-cutting technique to ensure re-vegetation and re-growth. In general, from the discussions of the chapter, it is possible to say forests, trees and bushes are given a somehow ambiguous space. On the one hand, they are regarded as damaging to crops because of their shading effect and roots if they grow closer to crop fields. On the other hand, their canopies and roots serve to render land firm and reduce soil erosion, promoting crop production. Of

course, the roots and leaves of some trees are regarded as good humus to the soil. Besides these benefits of trees, local knowledge has it that there has to be a buffer of space between crops and trees. This has been discussed as one of the reasons for tree felling or de-vegetation. On the whole, it is important to note that the discourse does not seem to be taking into account that trees are to be used in the different ways farmers do. Nonetheless, the fact is that if not used as timber or non-timber products, trees grow old and ultimately die. Notwithstanding technological, economic and political factors, cultural failure or lack of a culture of sustainable resource use needs to be considered as an important reason for the cumulative land degradation problem faced in the country.

CHAPTER ELEVEN: LIVESTOCK IN MIND AND THEIR ROLE IN FARMING

11.1 Introduction

This chapter explores local cultural perceptions of livestock and their economic significance amidst changing bio-physical and socio-political environments. Focusing on their economic aspect, the chapter also discusses their social and religious significances. It documents how a common human-animal origin is sought. Thus, I discuss the spiritual and symbolic significances of livestock showing that herding is not just an industry but also a way of life. Economics, religion, politics and ecology interact to determine the cultural understanding and management of livestock which are in turn affected by culture. I demonstrate that while traditional thoughts and practices still linger significantly, government and NGO intervention as well as depriving ecology, are gradually changing the traditional status-oriented livestock rearing into a new economic-oriented agricultural enterprise.

11.2 Spiritual and Symbolic Meanings of Livestock

In their mythology, Gäddäroans tell a common human-animal origin. Tales on the conversion of some humans into animals following their asocial behaviors suggest this common origin. This is told amidst the creation myth that God created life and other things for the sake of humans. It was said, the monkey, for instance, was a human being. “He” used to take too much credit from others. Since he was unable to pay back his debt, he put an oven on a hearth and sat on the hot surface, to change his appearance. The heat was so painful to him, that out of impulse, he ran into the jungle. Then, God turned him into a monkey to live forever with the scar on his rump. The ape was a human-being, too. In the same manner, “she” was cursed by the sheiks and turned into an ape. Further, it is believed that the mole was a farmer before becoming so

following a curse against him for customarily pushing onto the boundaries of other peoples' farms.

Once, Ğämal Usso, a man from Absaro, told his story to me and other villagers. He said he had a hyena suddenly block his way back home one evening. Rather than confront the beast, he pleaded with it, upon which the hyena opened the way for him. The hyena is otherwise regarded as the most vindictive yet "spiritual" beast.

The belief that a misfortune directed against individuals and their families shifts to their animals is widespread. Mere desire to conform to this belief could be a reason for households to tend an animal or two. In some cases, individuals are also advised to keep a specific animal with specific color to ward off impinging misfortunes. Such an animal is called *muhäkkäl*, kept to fulfill the role of a scapegoat. Hence, the death of animals in most cases is interpreted as a *fida* that is a misfortune otherwise directed against their owners or families.

It is also believed that animals have language and once used to speak. While Adäm was plowing with his oxen after he was expelled (together with Hawwa) from heaven, one day, he flogged one of the oxen to straighten him. The ox who considered Adäm overstepping, vowed to see him for revenge at *Yomäl K'uiama* (the Final Day). Adäm was shocked and kept silent. Then, God was rather disappointed on the ox and asked: "no matter what he did to you, how come you scare my slave so much? I have turned you dumb till the Final Day".[218] This notwithstanding, animals are considered still to have language for those who could understand them. For instance, if an owner intended to sell an animal, it cries, refuses to eat and scratches the land to express its dissatisfaction over the decision to sell it.

[218] Field notes

Such tales might symbolize unconscious attempts of humans' search for a common origin with the rest of the non-human animals. Despite the religious belief that animals were created to the service of human beings, these tales suggest some restraint with the added intention of teaching appropriate behaviors. The use of animal language in the cultural interpretation of the social life of livestock rearing also reveals that animals have important places in the symbolic world of these people.

The symbolic significance of animals is more elaborate. For instance, a good fortuned (*kabïtam)* animal will not sleep when all the others do. Rather, he will retire when the others are awake. He is said to be the keeper of the herd in the kraal like the sheiks (the *wälliyyoč)* and the men-in-authorities (*šumoč)* guard their people. According to local belief, not only do animals communicate with humans, they also do among themselves. When a *zulmi* (sin, harsh treatment) is done on some animals, this is communicated among all the rest to prevent the person from being a successful herder in the future. What is more, the animal that sleeps on a market place while others are standing is considered *kabïtam* or a sign of good omen, including success in agriculture. The belief is that such an animal should not be sold.

Oxen, cows and donkeys behaviors are also believed to represent that of their owners. Local interpretations in this regard are fascinating. Of all the animals, the ox is prioritized. In one of their Creation myths, the ox is the one that has been carrying the Earth since creation. In a like manner, the ox is the source of their main livelihood, farming. Again, it is believed that when older oxen are sold, the elders in that village shall die. My key informant from Awraççа, Bäkär Sämman, said,

> When older oxen are sold, the elders in that village shall die. It is said in every *gora* [village], there is an old ox, the king, the chair; the animals know him. When he is sold, all the rest of the animals in that village shall be sold one after another. The owners are simply enticed to sell them [without good reasons]. Conversely, if an ox is bought and entered into a new *kärra* [doorway, homestead] and he is a king, all the

other homesteads in the village will have new animals. Animals have language; if we mistreat them, they conspire and dissert us.[219]

This is comparable to the association of old trees with the survival of old people (See Chapter 10 for detailed analysis). Analytically, this could also be regarded as an unconscious symbolization of the submission of humans to the force of the non-human world, thence to nature. If not too far-fetched, it might also be interpreted as an old, subliminal representation of today's sustainability concern.

Cows are also imbued with symbolic meanings. My informant further said, "The cows also desert us….The people of the past used to say milk, a calf, a *wäliyy* [sheik] and a *wäggeša* [smith] do not go out of their *mäsïrïy* [home, work place]."[220] If some milk was given out, the milking cow would be less productive. A milking cow drives evils away. For instance, as she reaches home and lows, it is believed that misery and bad spirits shall go away. Upon this, the dairywoman, should immediately receive the animal and let the calf to meet with the mother. It is believed that there is an angel coming with the cow. This angel is said to let the animal urinate and give her milk as she entered home. Hence, the dairywoman should milk the cow as soon as possible. On the contrary, if she fails to do so, the cow shall keep crying and the angel will go off with his blessing. Instead, the jinn might possess the animal, in which case she will refuse to let the milk. If a woman gives some whey (*aréra)* to a neighbor, she puts in it a ball of butter to prevent the cow from falling sick because of the personal spirit of the individual which could be startled at the quality of the whey. Curd has the same restriction. Before some 40 years or so, milk was never sold. The cows disliked that. The meaning of milk is said to be "far-fetched". The first time it was found was in *ğännät* (heaven). The cows convert the grasses and the water into milk. That

[219] Interview transcript
[220] Interview transcript

milk is sold like anything now and taken everywhere is seen by the elderly as one of the reasons for the growing scarcity of milk.

11.3 Economic Valuation of Livestock

An elderly man in Hulluk'o recalled "The forests were dense. It was not possible to drive animals in the forests and in fact there were not many livestock here that time."[221] According to elders, livestock began to be economically important after the 1930s. Otherwise, an ox was sold for 2-6 *t'ägära bïrr* and only with time they fetched 12 -14 *t'ägära bïrr* per head. The number of human population in the area was also small. Their saying "An ox was enough to plow the fields of four or five households"[222], apparently more figurative than actual, is yet helpful to imagine small population and relatively abundant land. They said population pressure and land shortage started to be felt in the first decades of the 20th century. Today, except camels, all animals reared in Ethiopia are also reared in Gäddärro and Wärräbabbo at large. Cattle, sheep, goats, donkeys, mules, and horses have been kept since the beginning. Their roles as a traction power, source of cash, social security, manure, energy and beast of burden explain the economic worth with which livestock are reared. Shoats and equines are highly appreciated for their manure. In the past, some farmers kept mules and horses just for this reason. The time milk and milk products were not sold; they were important sources of protein and fat to the household. Otherwise, the assertion that livestock are a source of meat, milk and milk products among rural communities is defended only to a lesser extent today. A stranger might pick the wrong message hearing villagers say, "if they are dead, their meat is eaten", talking of livestock's benefits.[223] This refers to preemptive slaughters when an animal

[221] Interview transcript
[222] Interview transcript
[223] This is frequently heard among these farmers in their free- listing of the benefits of livestock to them.

is threatened by death from sickness or injury. Ritual slaughters of animals, though nowadays on the decrease, used to significantly supplement local protein requirement.

The district of Wärräbabbo is estimated to have more than 60,000 heads of cattle; nearly 48,000 shoats; more than 1,000 camels; more than 64,000 chickens and nearly 6,000 armies of bees. Severe feed shortage; disease and lack of improved cultural practices are mentioned by government agricultural experts among the major constraints of livestock production in the district. The annual dry forage requirement of the district was estimated at 113,057 tons; whereas the supply capacity was just 70,190 tons, showing a deficit of 42,870 tons in the year 2008/9. (For the number of livestock resources of the district and dry forage demand and availability for the production year 2008/9, see appendices 27 and 28).

In Gäddärro, there were more than 4,000 heads of livestock in 2009 according to the FA Agricultural Development Office. Data obtained from same source, for the same year, indicate that the amount of dry matter feed produced in the FA was 3,240 tones whereas the annual requirement was 4,937 tones. The year had experienced a deficit of 1,697 tones of dry matter feed. Out of the 132 households included in the survey, 88.36% (14.39% FHHs) reported keeping some livestock during the time of the survey (My survey, October 2009).

Table12: Household livestock ownership of the three ethnographic villages

HH types	Ox	Cow	Bull	Heifer	Calf	Sheep	Goat	Donkey	Mule	Horse
MHH	76	51	30	24	25	56	22	15	3	1
FHH	8	10	2	2	8	10	1	1	0	0
Total	84	61	32	26	43	66	23	16	3	1

Source: My survey, October 2009

At the time of my survey, there were 331 livestock among the three ethnographic villages. That meant an animal was shared between two persons. The livestock management style in Gäddärro is largely traditional. Even though free grazing, the main traditional feeding style, was to be reduced in the wet seasons and there has been government restriction since the first half of the 2000s, it still accounts for about 31.25% and 15.62% of feeding practices during dry and wet seasons, respectively, according to the Gäddärro FA Agriculture and Rural Development Office in 2007. According to the same source, 33.33% of feed during the dry seasons is born by hay, 8.33% by weeds and leafy matters and 27.08% by crop byproducts. Grazing (15.62%); hay (12.5%); weeds and leafy matters (50%) and crop byproducts (21.87%) covered feed requirements of the wet seasons. (Appendix 29 has the number of livestock in Gäddärro FA and annual dry matter forage requirement for the production year 2006/7).

Like crop production, livestock rearing is carried out amidst constraints. Ecological problems such as drought and land shortage have impacted on livestock rearing. Shortages of feed and grazing land are the most serious problems. Cultural perception which favored large number of animals as a symbol of prestige and a risk aversion strategy has had some negative impacts even though currently many households have decreased the number of their stocks. Lack of money to support livestock production was mentioned as the third important constraint. This appeared to somehow contradict another finding that the commodification of livestock was increased. It might still mean that it was a hard decision to do this. The need for more money needs to be judged against the diverse channels that let money into these rural communities namely, government and NGO credit, their asset creation programs; remittances and increased livestock off-take. Therefore, money problem is more likely to be prominent where these channels are no or less available and when purchasing some feeds during dry seasons.

Table 13: Problems in improving livestock production (R=117)

HHs	Feed	Water	GL	VS	Disease	IB	Labor	Market	Money	Credit
MHH	98	26	74	19	21	34	65	16	69	20
FHH	19	3	12	5	7	11	13	0	13	3
Total	117	29	86	24	28	45	78	16	82	23

Source: My survey, October 2009

GL: Grazing land; V S: Veterinary service; IB: Improved breed

Along with the ongoing ecological change, there has been a growing shortage and commodification of livestock feed. It was not uncommon to observe villagers negotiate the transaction of anything that served as a feed, particularly during the drought of *billagi* 2008. Questions to find out if households bought and sold livestock forage in 2008/9 production year were included in the household survey. The result demonstrated that 37.30% of villagers bought some forage whereas 14.51% of them sold some during the year. On average, each household had spent birr 358.58 on feed purchase whereas birr 154.47 was gained similarly by each household that sold some. The maximum expenditure was birr 3,000 whereas the maximum income was birr 900. The reason why the number of those who bought is greater than those who sold is that part of the purchase is done by going to the lowlands. Again, even within the highlands where the research communities live, households who had to sell forage at a certain point in time might be buying at another. This is because livestock off-take and re-stocking are faster today.

Plate 30: Livestock market place in Bistima town

The economic significance of livestock has increased over time. As already mentioned, meat and mutton have insignificant place in local nutrition today unlike what they used to be for the ruling classes and the rich in the past. Decreasing milk productivity and its commodification have further made this product to be less consumed at home. However, cash income from the sale of livestock has dramatically increased over the years. Therefore, unlike in the long past, sale of livestock has become an important source of income for the food provisioning of households. Their role as a financial security is also quite high. As Daniel Gamachu (1990) noted many years ago, livestock are to rural households what a bank account is to the urban middle class. This is notwithstanding the strong emotional attachment of farmers to their animals.

The low uptake of meat and mutton is also due to cultural reasons. My key informant from Šola Gända, Ahïmäd Bädri, said,

When an ox dies there is *k'ïrça ïddïr* for cows and other animals as well. Some months ago, I bought an ox from Bistima for ETB 1,700; it died and the *ïddïr* gave

me 400 birr. I finished the money without doing anything with it. They eat the meat. It was not possible for me to buy a calf with that birr. The ox was not able to recover; I even took it to the vet clinic in Goha; it did not help. It got too sick; then the *gosa* killed and shared the meat. The vet did not tell us whether it was dangerous eating its meat. But it was not dangerous; I have eaten it myself. When we killed it, we got the disease on the head. There are many people here who do not eat meet because of *nïggïrït*[224]; they say they will fall sick if they do. The majority do not eat. They are the ones who have TB and skin diseases…. There are some people who really fall sick after eating meet; I myself do not like it because I was sick for a long time. Again there are people who say milk causes ameba on them, especially fresh, hot milk.[225]

In the production year 2008/9, 39.39% of the survey households sold at least an ox earning a mean income of birr 2,736.53 and 11.36% of them sold at least a bull earning a mean income of birr 1,128. During the same period, 13.63% of them sold at least a cow deriving a mean income of birr 791.66. What is more, 28.78%, 10.60%, 7.03%, 5.30%, 3.03% of households sold sheep, goats, heifers, donkeys and calves with a mean proceed of birr 403.03, 486.78, 695.55, 438.57 and 487.50, respectively.

Households with large number of children are said to be opting to keep large number of livestock. Such households also think that they could support the education of their children and food purchase from the sale of animals. Large number of children also used to supply the labor needed to support large number of animals in the traditional practice. Keeping large number of stocks was also used as a coping strategy against shock. If part of the stock was to be perished, the remaining was used to cope with unexpected economic problems and to restock herd. Accordingly, a farmer from Hulluk'o remarked that if there was effective family planning, first of all, public attitude towards large numbers of livestock would change. Even though feed scarcity and land shortage prevent households from keeping as many animals as before, the knowledge that such households were economically better is said to linger still. The ongoing drought and other natural problems, along with modern

[224] A mystical forecast of the future told on behalf of others by those believed to possess the power.
[225] Interview transcript

agricultural extension and government restriction on free grazing have made the integration between livestock and crop production a more crucial matter.

Everywhere the plow dominates, oxen are the basic means of farming. Cows are primarily kept to ensure the supply of oxen. Shoats are primarily for sale. Shoats are sold before the calves, the calves before the cows and the cows before the oxen. This strategy affects the total livestock size a household wishes to own, irrespective of availability of feed and extension advice to reduce stock. The non-economic factors discussed so far are not in the limelight of policy and extension services but for farmers, animals are not just means of economic subsistence. They are a way of life.

Animals convert non-edible materials into food. However, because of cultural and economic reasons milk and milk products are marginal in the household dietary system. As already mentioned, meat and mutton are nearly completely absent except during ritual slaughters. A preemptive slaughter made on a dying animal adds up to the chance of access to protein. The gorgeous and cliffy terrain adds on to this involuntary source of protein. Amidst these scenarios, still many people in Gäddärro are averse to consuming milk, meat and mutton because of perceived or actual health reasons. As a result, the great majority of animals find their ways to the market. Although these subsistence farmers consider themselves as more of crop growers than livestock herders-as the extension personnel do, the sales of livestock and their products are by far expected to exceed that of crops. Therefore, livestock today, more than in the past, are the main sources of cash for rural households. Skins and hides are irrelevant to the household economy as animals are sold live but there is awareness about their contribution to the national economy. In a case of a farmer in Awraççа, he was able to fetch a net profit of more than seven thousand birr by purchasing and selling oxen (after plowing season) and a cow within about three years' time.

As mentioned, elderly residents recall that the market value of animals was marginal during the period of Haile Sellassie I. Now fattening animals for the market, mostly oxen and sheep, is becoming a specialty within the farming system. Thus, the economic horizon farmers' have of livestock rearing has improved. Livestock credit supply, vet services, bull stations and artificial insemination delivered primarily by government credit institution and agricultural extension personnel have improved local capacity for economic management of livestock. In this regard, the long-seated cultural perception that stockbreeding was a "zero-input" industry is significantly displaced. It has now become an industry requiring input and investment. In my quantitative household survey, many respondents were confused to tell whether or not they raised animals. They suggested the transfer from herding to keeping animals. This was so because of the already mentioned commodification of animals and their frequent off-take. Herding was essentially associated with breeding which they have been doing less and less over the years. Keeping appeared to be more appropriate as it suggested the practices of purchasing an animal, fattening it for a certain period, using its draft power and then selling it at a premium and buying another to do same. Government and NGO credits in this process of change are quite significant. One of my informants recalled, *"Aratt ïgïr baratt amät ayïtäkkam yïbbal näbbär": "they used to say it was difficult to replace a four-legged animal within in four years".*[226] He added, "Now we could purchase [an animal] by government credit; before, this took the farmer more than four years."[227]

Credit supply and the other forms of extension services already mentioned, coupled with the growing consumption of meat and mutton, particularly in urban Ethiopia and the burgeoning of international markets for live and slaughtered livestock, have boosted the economic importance of livestock for millions of rural households in the country. In the process of this change, as it

[226] Interview transcript
[227] Interview transcript

is just mentioned, the term *käbt marbat,* which used to adequately express traditional livestock production, is no more. This means that without the need to bring a change in language, farmers have been transforming their livestock production practices. This strengthens one of the findings of this dissertation that the linguistic perception of environmental changes or practices comes well after the changes and the practices have taken place.

11.4 Social Significances of Livestock

Irrespective of their economic relevance in scientific terms, individuals and families who have had stocks in hundreds were considered as rich and respected. Thus, in the typical traditional sentiment, sheer livestock headcounts bestowed status-honor to their owners. The institution known as *čägguarra mälbäas* (lit: wearing stomach) resulted in ritual slaughter of animals and dressing of the owners in public with fresh stomach of an animal killed for the purpose. Thus, an individual symbolically wore a stomach when 50 of his cows gave birth at about the same time. Hence, the exaltation that so and so wore this and that number of stomachs was a source of pride and prestige to those owning large herds. This institution had encouraged rearing of large numbers of livestock and land degradation in the past. The disposition of livestock as marriage prices is likely to have had the same effect.

For cultural, economic and ecological reasons still a significant number of farmers may prefer to have more number of animals though comparably smaller than what used to be the case in the past. All the same, the culture which embellished significant social importance and acceptance to large number of animals is not as strong. It is showing a decreasing trend due to factors such as scarcity of grazing land and forage; awareness on fattening animals; decline in bonding animals; child labor shortage; and the restriction on free grazing in favor of stall feeding. The saying, *"yäkäbït bïzatïnna yägïrar at'ïr and näw"* compares owning large numbers of animals with acacia fencing. Acacia wood is easily attacked by termites and collapses soon

if used to erect fencing. Local interpretation of the saying is also that large numbers of animals kept by a household will suffer death and risk in the face of the growing feed scarcity and drought. In the face of the ecology of the long past, increased chance of stock survival after a shock was to be achieved by having more numbers of animals. On the contrary, today, even though many farmers still wish to diversify their animals, keeping lesser number of animals is a better strategy to have one's stock survive moments of drought and pronounced feed scarcity. The expansion of veterinary services has its positive impacts here. Apart from revealing the dynamic nature of the ecology of livestock rearing, this finding presents the complexities of this dynamics at different temporal scales and political settings. This also justifies the merit of composite theorization in the study of ecological relations.

Milk-sharing among neighbors and relatives; meat-sharing among *k'iré* members on religious ceremonies and following the crisis-slaughter of a dying or broken animal; teaming-up plow oxen; bonding animals mostly between the haves and the haves not and renting or exchanging oxen for human labor and forage formed the major aspects of social transactions over livestock. The social aspect of sharing "crisis-meat" of a dying animal was even more active and dramatic. This also happened when the slaughtered animal had fallen sick from suspected communicable diseases such as *gäddähabi*[228]. Upon this, in the long past, the youthful and male adult members of a community took to the jungle with the suspected animal. There, the sick animal was killed and butchered. The meat was cooked and eaten, carefully burying everything that remained, including the waste and urine of the men who consumed the meat, in order to prevent potential transmission of the disease to other animals and human beings. One may be daunted even at the very thought of this but, in the case of these people, where meat and eggs were not dominant items of the household diet for the common people, the biological crave for protein, amongst others, might have some work at this. Milk-sharing nowadays has

[228] This was a common animal disease in the past affecting just cattle.

been decreasing because of reduction in milk-productivity along with drought and scarcity of forage. With the commodification of milk, the scarcity is said to render women quite mean even with their husbands leave alone others.

It is already clear that the people of Gäddärro tend animals for varied reasons apart from their economic significance. There is a strong emotional attachment between animals and their owners or caretakers. Because of this, it is said; animals show great respect and affection to human beings. When animals are starved, this is conveyed through cries. Farmers do not simply regard their animals as economic instruments; they regard them as their children and reliable friends. Awwäl Šaši, a farmer from Awraççа, said that he had to avoid being noticed by his animals entering his compound in order not to hear their heart-breaking cries demanding for more feed during scarcity. In such a human-livestock relationship, the odor animals give off is received as a life-giving smell, one that is well enjoyed and craved for when it is missed. In the absence of a human company, animals are regarded as friends. A person spending a night in a lonely house would not feel so if there is an animal. The woman, Käddo Mussa, from Absaro said their compounds would have been full of overgrowth if it were not for the animals that grazed them. To farmers, unlike to experts, animals are not just means of economic subsistence. They are a way of life as in the oath-making phrases *"kägïggän bälay yälğ šïtta kägïggän bätačč yäkäbt šïtta yasat't'añ"*. This roughly goes as *"May I lose the odor of a child and that of an animal at my home"*. Similarly, getting sworn in as saying *"çägäréta yasat't'añ"*, (lit. something like *"may I lose the hair of an animal",* sometimes done pinching some hair from an animal, epitomizes the centrality of livestock in their life.

Each animal is given a name. At a certain point in my fieldwork, I was curious and had a free-listing of more than 12 dozens of livestock names. For the researcher interested in language and the environment specifically, a deeper investigation might entice the possible generalization that at some point in the

past, these communities depended more on livestock than on crops. Comparably, the naming of crops appeared to have less semantic breadth.

It has been already discussed that the geo-physical threat on livestock resulting in breaking or death of animals and other mishaps are integrated into the social security of the *gosa* institution. Members contribute money to compensate a member for such damages. Instituting controlled grazing and providing veterinary facilities, potentially reduce the social pressure on *gosa* members or the significance of the institution in this regard. To the same degree, this process is ultimately expected to make livestock herding, predominantly, if not fully, one of a private venture. In view of this likely scenario, it is enticing to predict that the more agricultural activities are privatized, the less their organization and natural resource use would remain under the dictum of local institutions. In turn, this calls for the sustenance of government and NGO institutions that are already replacing local institutions.

11.5 Ecological Attributes of Livestock

Livestock cause soil erosion while moving, overgrazing pasture and browsing vegetation. As a result, gullies can form as in Gäddärro. The saying, "*wuha yäsäwïnna yäkäbt ïgïr yïkkättälal*": "*water [erosion] follows the footsteps of humans and animals"* underlines this erosive factor (See Chapter Seven for full discussion). In the face of this, it is also quite obvious that animals are not just ecologically destructive. Their manure, especially those of equines and shoats, are excellent inputs for soil conditioning. Some farmers are concerned that the ongoing trend for smaller size of stock might risk this benefit. From their long-term and everyday interactions, farmers have formed a body of knowledge about their animals. Major aspects of local knowledge in this regard are described in the following paragraphs with respect to each animal.

Shoats: Goats are small-sized; well-suited to go through difficult terrains. They are picky and naturally closer to household and kitchen wastes. Their

protruding mouth enables them to pick even thorny bushes and trees inaccessible to large animals. As a result, goats are assumed as the most drought-tolerant animals. Reduction in the number of goats reared today compared to the past might be explained, at least partly, by the generally decreasing vegetation and shortage of bush lands, a convenient environment for goat production. Goats were the ones to be significantly de-stocked in response to government restriction on free grazing. Owing to almost the same natural attributes mentioned for goats, sheep are regarded as the second important animals to resist drought.[229]

Heifers and bulls: These animals are believed to be the most drought-tolerant from the cattle group, next to shoats. Their youthful age, their freedom from the reproductive burdens of giving offspring and plowing, are the most important factors in their favor.

Calves: They depend mainly on their mothers' milk but would get little during drought times as priority is given to the mother cow rather than risk the lives of both. The economic pressure to milk cows even during drought times in some households could further put the lives of calves at risk. Therefore, calves are the most susceptible animals to drought and fodder scarcity. They had the highest death toll during the dry spell of *bïllagi* 2008.

Milk-cows: These animals are the second most affected by drought due to incapacitation from the burdens of reproduction and milking to some extent. Until the condition of the mother cow is very precarious, after which she

[229] According to archeological evidence, sheep and goats are believed to have been introduced into Africa from the Middle East. Based on the bone evidence from Abu Hureyra in Syria, the early domestication of these animals showed radiocarbon dates of c. 11,000 years BP (Anderson and Johnson, as cited in Johnson and Anderson, 1988, p. 34). The earliest archeological evidences of the presence of these animals as domesticated livestock is recorded at c. 8000 BP for Egypt and 5,500 BP for the Sudan. The southward diffusion, including into Ethiopia, of these animals, might be expected to be a little later than the date mentioned for the Sudan. Therefore, sheep and goats are very likely to have been raised in the highlands of Ethiopia for millennia, contributing to the gradual environmental change which has resulted in the current degraded landscape.

might not be milked, milking would continue in some households even though the yield drastically decreases. The saying, "*wäk'ïtun aytäš ïläbiññ*", personifies a milk-cow as complaining about the dairywoman: *"milk me just what the time allows"*. This is indicative of the practice of over milking cows.

Draught oxen: The need for traction power, three times a year, renders them the most economically important animals. During droughts, they are more susceptible to the problem, almost to a degree comparable to that of milk-cows for not being well-fed to replace lost energy. What is more, their large size, large mouths and clumsy legs, compared to the shoats, restrict their ability to browse thorny materials and maneuver places with accessibility difficulty. The largely mountainous nature of the district detracts from the adaptive capacities of cattle in general.[230]

11.6 Chicken Production and Apiculture

11.6.1 Chicken Production

Poultry is confined to chickens in Ethiopia and chicken-raising is left to women and children. In a male group discussion on livestock rearing, a man laughed at my questioning whether they would seek a veterinary assistance for chickens as they do for shoats and cattle. He imagined himself carrying a sick chicken abreast to see a professional service in the nearby station in Goha. Chicken production, however, has been a source of everyday income for rural households and it might only be a matter of time before they take chickens to seek veterinary services. With market price increase for chickens and eggs across the country over the years, nearly every rural household collects tremendous amount of money from their sale. A farming household should not have to contemplate selling a sheep or goat to cover land tax when there is a

[230] At the very latest, cattle are expected to have been domesticated c. 5,000 BC in northern Africa if not as old as c 9,400-9,200 BP, according to bovid bones found with pottery shreds (Gautier, A., as cited in John Gowlett, 1988, p. 36).

cock and some eggs in the house which could be sold readily. Chicken and eggs are basic parts of the feasts prepared on religious holy days in Ethiopia.

Out of the 132 households surveyed, 83.33% (16.66% FHHs) reported raising some chickens. In spite of growing economic importance, chicken production is still traditional, rendering them susceptible to disease and attack from beasts. Out of the total, 74 households grow local breeds alone whereas 14 grow improved breeds alone and the remaining 22 kept both breeds. The 20 households reporting zero-ownership did have chickens in the past and re-stocking was said to be inevitable in the near future. According to the survey, the major reason for this was lack of enough space. Freely roaming chickens destroy gardens and crop fields, particularly in their tender ages. Complaints on trespassing chickens are common.

Table 14: Problems in improving chicken production (R=108)

Household Types	Feed shortage	Improved breeds shortage	Low market price	Space shortage	Disease	Lack of vet. service	Beast attack	Bird attack
MHH	22	31	2	37	28	18	55	74
FHH	7	10	0	13	6	6	15	19
Total	29	41	2	50	34	24	70	93

Source: My survey, Oct. 2009

As can be observed from the table, this important economic activity is affected by a number of managerial, economic and ecological difficulties. Expertise knowledge that chickens grow on a small space of land is challenged by the traditional practice that let them roam freely rather than keep them in cages. Therefore, this traditional management of agricultural space has rendered an otherwise ample resource for this purpose, quite scarce, preventing households from keeping large number of chickens. This traditional practice has also rendered the natural environment a source of loss as threat from beasts and birds preying on chickens are serious problems.

Raising chickens according to experts' recommendation through the help of WDARDD is quite sporadic and limited to fewer households. Day old chickens and cages bought from the government incubation center at Kombolcha town were distributed to some farmers in 2009 by this department. Probably, as a result of this, separate housing for chickens was mentioned by the majority of the survey households as one of the measures to improve their production.

11.6.2 Apiculture

Apiculture in Ethiopia is still in the grips of tradition but local government experts believe that Wärräbabbo has favorable ecological conditions for honey production due to diverse floras, weather conditions[231] and naturally available waters. Currently, the district keeps about 5,000 traditional (owned by 2,172 farmers); about 170 intermediate (owned by 150 farmers) and more than 1,200 modern (owned by 1,210 farmers) bee hives, totaling an army of more than 6,400.[232] According to the district expert for apiculture, in all varieties of hives, there could be 60,000-120,000 bees. Intermediate and modern bee hives were introduced by government since 2005/6 through resources secured from bilateral donors.

According to this expert, the annual harvest from traditional bee hives is 5 to 8 kgs of honey whereas the intermediate ones could yield 15 to 20 kgs and the modern ones 30 to 35 kgs. For every 100 kgs of honey from the traditional and intermediate hives there is 10 kgs of wax, but there is only one kg from that of modern hives. This is an important technological breakthrough provided that farmers adopt it effectively and efficiently. Intermediate honey bee hives (at a cost of ETB 556) and modern ones (at a cost of ETB 600) were distributed to farmers by SIDA and World Bank funding, in the context of food security projects, respectively. In the beginning, it was said, farmers paid

[231] *Wäïna däga* ecology is said to be the ambient for bee management but weather variability in the other two agro-ecologies of the district is also said to create favorable condition to this activity.
[232] Personal communication with WDARDO apicultural expert, 2009

just ETB 286 for the latter because funding was delayed and the local government decided to distribute the hives at a discounted rate. Higher costs later did not deter the acquisition of the new hives suggesting that there is good level of acceptance for them even though there are also complaints like an army disserting its hive. Two modern honey filtration equipments financed by the World Bank project were distributed on credit to each of the 20 farmers associations in the district. Though still wanting, trainings were given to selected farmers on how to operate these equipments and manage the newer hives. There are more than a dozen types of locally made traditional hives in the district costing a maximum of 10 Birr each.

Spraying pesticides for crop protection is said to be a serious problem poisoning bees to death. Until very recently, the government did not give due attention for bee production. Nonetheless, apiculture requires virtually no land and its labor and managerial requirements could be fulfilled even by less resourced households.

The numbers of households keeping bees among the research communities are rather small compared to the other aspects of livestock production. Only 18 households (1female headed) were engaged in bee production during the time of the survey in October 2009. Eight of these had traditional; three intermediate and seven modern hives. Regarding problems to improve bee production, responses obtained from them were pests such as termites and spiders (11); improved hives shortage (3); high cost of improved hives (5) and feed shortage (9). Currently, there are many farmers interested in keeping improved beehives but the price is said to be so high for most of them. According to the livestock development agent in Gäddärro FA, the provision of modern hives was started in 2005/6 production year. They were supplied to interested farmers at the rate of Birr 286 per hive on credit basis to be paid up in three years time. Then, a year after, 38 intermediate hives (Kenya top bars) were freely given to farmers in the context of a project financed by SIDA. In

the same year, five armies of bees were purchased for five households by the national NGO called Water Action, also operating in the district. These households were given ETB 350-400 each in order to finance the purchase of these bee armies.

Some farmers in Gäddärro said the productivity of improved bees is not as high as that claimed by experts. The agent and district-based experts on their part believed there is good knowledge of this benefit. However, since 2008/9 production year, the office started selling a single modern hive at a rate of Birr 600 and the transaction was to be made on cash. The reason was that since the farmers were already made to know the benefit, it was necessary to recover full cost. As already said, the first sale was subsidized by government in order to introduce the technology and create the demand. The increase was not to be justifiable by farmers' perception even though five farmers from mid-highland Gäddärro had already applied to purchase the six improved hives that were supplied to Gäddärro by the WDARDO in 2009. According to the agent, eight intermediate hives were said to have been produced by farmers themselves from locally available materials. Free distribution by SIDA, Water Action and government subsidy, which was lifted just within two years time, was mentioned as a negative precedence to achieve full cost recovery. Hives were distributed with a training package and follow-up technical assistance by the agent and three specially trained farmers within each sub-FA, including the techniques of collecting the harvest. Much work remains to be done on the part of farmers, government and NGOs in order to increase the number of rural households keeping honey bees as part of the overall development program amidst growing shortage of agricultural land.

11.7 Crop and Livestock Production Technology

Farm implements and livestock management have continued to the present without significant changes. The use of the oxen drawn plow, believed to have been in existence for three millennia, is still the predominant implement. Owning the plow and its accompanying implements and other tools such as sickles has been a key factor for smallholder farming. Generally, the implements used in crop production are those applied for plowing, harrowing, digging, breaking, cutting, threshing and storing. Most of them are made of wood and different trees are valued for different purposes. For instance, the beam into which the lever of the plow is inserted is largely made of African olive tree for its extraordinary strength. The yoke is similarly made from *wanza* because of its strength and light weight to not overburden the oxen. It has also got the quality of not getting hot as heavy contact is made with their napes and humps, preventing the breaking and swelling of their skins. From the agricultural implements used for cropping, cutting tools are superior in numbers. As they are also used for splitting logs, chopping fuel wood and cutting stalks for livestock, even households considered to be so poor own a number of these implements. An old man in Wärrä Ruga, Mummé Roba, owned seven different sizes of axes before he lost them all to thieves.

Table 15: Household ownership of plowing implements (R=131)

HH type	Beam *(Mofär)*	Yoke *(K'änbär)*	Plow *(Maräša)*	Iron-tip	Pick-axe	*Mäçaria*
MHH	110	10	99	104	103	101
FHH	9	9	10	17	17	21
Total	119	19	109	121	120	122

Overall, 51.14% of the households owned from two up to six beams; 29.77% of them two or three yokes; and 13.74% of them two or three plows. What is more, 39.69% owned two to four iron-tip hoes. Therefore, the actual number of these implements is by far greater than the number of households owning

them. As a result of the stiffness of fields rendered by animals grazing stubbles and rocky materials underneath the topsoil, beams and plows break frequently, necessitating the safekeeping of spare implements. The problem is exacerbated by deforestation and soil erosion in cases were adequate rehabilitative and conservatory measures are not taken. The importance of iron-tipped hoes is central in the preparation and maintenance of SWC structures such as bunds and trenches. Demolishing bunds and digging 'virgin' farm margins to expand fields have increased the importance of hoes.

According to my observation, rural life involves more of cutting and chopping than plowing, digging and cultivating. The latter activities are largely seasonal; the former, that is cutting, cuts across seasons. Again, the former largely cut across gender and age whereas the latter are largely restricted to men. As a result, agriculture among the communities I studied is basically a cutting and chopping enterprise, impacting heavy tolls on trees and vegetation as a whole. Carrying on one's shoulders the small-sized axe called *t'ïllïk'k'o* is customary for men and young males. It is a defense against the self. It is applied to chop off tree branches or bushes that obstruct one's way in an environment. As I was trying to get myself accustomed to the difficult topography during the heavy *kïrämïť* rains of 2007, those along with me simply put their axes on what was available around to get me a walking stick. In the beginning, I was unwise to allow this happen for more days as I was at times not carrying back those sticks I was given the other days. This was only to be stopped when Ayyalέw, who had been a great friend and help from the beginning, availed to me his well-crafted walking stick which I used till I got well with the difficult topography. Villagers who leave home without a walking stick do the same. Axes, as plows, are at the center of agricultural activities.

Table 16: Household ownership of cutting implements (R=131)

HH type	*T'ïllïk'k'o**	*Mät'ïräbia**	*Mïssar**	Maçïd (sickle)
MHH	107	97	86	108
FHH	20	15	13	23
Total	127	112	99	131

*All are axes of different sizes

Source: My survey, October 2009

Sickles are the most numerous implements owned, the average holding being 2.42 per a household, ranging from one to10 per a household. The mean of the axes run from 1.03 to 1.24 pieces, with a range of one to six per household.

Plate 31: Most of the traditional farm implements currently in use

The techniques of livestock production are simple. Free grazing in the past and stall feeding nowadays dominate livestock feeding strategies. Traditionally, zero grazing was largely practiced during parts of the year fields were not covered with crops. Traditional fattening is seasonal with June to

September as the fattening period because of availability of ample grasses, crop tin outs, weeds and water. Before food shortage was experienced, livestock, mostly oxen, were also fed boiled grains and bread made from flour. Currently, forage plants introduced by government are believed to supplement feed needed for zero grazing. Again, there used to be the tradition of building temporary livestock kraal *(wuräné)* within the farms so that animals were zero-grazed there and their manure was applied on the spot. Currently, some households keep separate houses for their animals while others have compartments for animals in their homes. Nearly all households have feeding troughs called *k'ik'k'it* and this somehow saves feed.

There is a fine of ETB 50 when animals trespass into others' fields. While it applies to field crops as well, the trespass carries more weight before local officials in the case of the recently government-introduced forage trees. As has been shown and suggested elsewhere in this dissertation some element of politics comes into play in a manner that does not fit local preferences. This apparent mismatch, however, should not be necessarily interpreted as violation of local economic rights. Such assertions need to be approached with caution. From an ecological point of view, local ways are not always superior to government ways. Though not yet fully practiced, local residents are quite aware that the degraded environment is remarkably improving following the ban on free grazing. Their negative view of the regulation crops up when it is valued against traditional livestock management. Even though there are many farmers favoring the regulation because of benefiting from stall-feeding and keeping economically viable number of animals, it will take time before the new practice is fully accepted. Thus, the regulation is actually beneficial to farmers in immediate economic terms as well, except that the practice of spreading risk through different stock types might be affected. Among others, it controls inbreeding, prevents disease transmission, improves the quality of exportable livestock products and facilitates natural resource protection and development activities (ANRS, 2005). This finding is amongst those

demonstrating that TEK and practices are not necessarily superior to government ways in the redemption and conservation of natural resources. The logic of community participation might be challenged in this regard since every community interest is not necessarily economically and ecologically beneficial. Therefore, notwithstanding the notion that community participation is essential, my findings reveal that decisions that might *prima facie* run against local interests could be nevertheless helpful both to smallholders and the environment as well.

11.8 Livestock Production Problems

Success or failure in livestock rearing is not only a practical issue. It is also religious which involves nearly all aspects of life. Death of animals from acknowledged diseases or accidents could be explained religiously. Religious explanations could be strong enough to influence thoughts and behaviors. The following case I heard from a second party about a couple seems to be quite illustrative of this.

About four years ago, a married couple in Awraççа lost a cow and an ox in a short range of time. The cow fell sick and the ox slipped off a cliff. The couple was much aggrieved. After four years in 2009, another cow pitched headlong off a cliff as she was grazing in the mountains. The cow left a calf behind and the couple was trying to save its life. The person who narrated the story to me incidentally met the wife and inquired as to why they 'kept silent' in the face of the problem getting repeated. He was actually asking as to why they did not 'go somewhere'[233]. She told him that when the ox was dead they had made *t'älla*, bought *çat* and organized the collective prayer *wädağa.* At the height of the prayer, that is *mirk'ana,* the man who was ahead of the session exclaimed that they had blocked all the cliffs and the diseases from their animals for a period of four years. Till this deadline was past, the woman

[233] 'Going somewhere' is an indirect reference to seeking the help of a sheik (a traditional healer), simply understood from the context of its use.

told the man (my narrator) that she had seen no animal die, even a chicken. The deadline was past and unfortunately another cow plunged off a cliff as already mentioned. Before that, the woman and her husband differed, the position of the man carrying weight. The woman was persistent on having her husband call back the *wädağa* before the four-year deadline was gone. This time around, the man had a change of heart that things were under the will of God and saw no point in events such as *wädağa.* The anticipated prayer remained unrecalled. The woman was convinced that the death of the second animal was associated with this failure, and was worried further mishaps would occur.[234] Throughout his story telling, my 70-year old informant was quite approving of the woman. He tended to reject the leniency and change of heart of the man and repeated the old adage: *"yällämmädutïn yasllammädutïn mätal nägär yamät'al":"departing from the norm is a cause for mishaps".*

According to the Gäddärro FA Agriculture and Rural Development Office livestock extension agent, livestock production in the area is affected by what it called traditional and other factors. Among the first was free-grazing which in the first place promoted disease transmission, hampered the multiplication of forage trees, threatened plant species and invited more soil erosion. It is also a cause for disease transmission among herds and flocks. Moreover, it promotes in-breeding and female animals mating with bulls and rams not favoured for breeding, also causing productivity reduction. As a second major problem, the extension agent said that even though farmers were developing the custom of taking sick animals to veterinary services, generally the service was not sought in time. The third problem mentioned was inadequate use of improved forages. Mentioned from among the second category of other problems was inadequate agricultural inputs provision. For instance, in 2009, modern bee hives procured by the district were just 80 out of which six were allocated to Gäddärro FA. The other problem mentioned was delayed and inadequate supply of artificial insemination (AI). This was compounded by

[234] Field notes

farmers placing demand for AI at different times throughout the year. Among others, high cost of preferred forage seeds such as Alpha Alpha, which was ETB 600 per kg in 2009, affected livestock production in the FA.

Livestock pests and diseases are major production reducers all over Ethiopia. The Amhara region, which accounts for about two-thirds of the livestock population of the country, is importantly affected by these problems. According to data found from the Wärräbabbo District Agriculture and Rural Development Office (2009), the major veterinary problems occurring in the district, including Gäddärro, are: the bacterial diseases black leg and bovine/ovine pastuereolosis; the viral disease lump skin disease and internal as well as external parasites in decreasing order of severity. Mastitis has a high occurrence at times blocking tits and affecting mothering and milk production. The first problem, the bacterial disease black leg, is a soil-borne disease, mostly occurring after rainy seasons. The affected animal will have swollen legs, gasping breath and heightened body temperature. It is a killer disease, taking life within 48 hours. Bovine/ovine pastuereolosis, also a bacterial disease affecting the respiratory tract of the animals, is the second severe livestock disease in the district. Death occurs due to lack of oxygen. This disease is usually caused by transportation stress; hence the additional name transportation disease. It occurs mostly in hot areas so that the ethnographic villages are less affected by it. Lump skin disease, a viral disease transmitted by flies, is the third serious animal disease in Wärräbabbo. It has high morbidity but low mortality rate. It develops lesions on the skin. Unless the animal is already weakened due to other reasons, the disease is not fatal. Internal parasites which are de-wormed by vet services in the district and external parasites formed the fourth and fifth health and production constraints in livestock management. The latter are treated by external application of acaricides by vets stationed in rural areas and those at the district seat in

Bistima. The other health problem is mastitis with a high occurrence even causing the blocking of tits thus affecting mothering and milk production.

There are rich ethno-medicinal practices. Some of these are valued by the district veterinary specialists while others are not. For instance, black leg, an aerobic disease, is treated by cutting a blood vessel of the sick animal in order to allow oxygen in let. This is effective and similar to the scientific method of treatment. Farmers call this disease *wärč.* Plant concoctions are given to the sick animal for *pastuereolosis,* which is locally called *silo.* Professional veterinarians regard this not only ineffective but also risky, causing chronic respiratory problem on the lung. Branding is done for lump skin disease but ineffective according to the vet doctor at the WDARDO. *Indod* concoction is applied to treat leach, but its prevalence is low. For the disease called *dermatoflosis,* which is caused by a bacterium, the leaf of the plant called *béngĕ* is applied. The vet doctor said this could be more effective if scientific investigation was done on it.

Plate 32: Treating a sick ox by a traditional healer in Awraççа

In addition to the vet doctor, there are five vet officers in the district stationed at different places carrying out diagnosis, direct test and treatment. The veterinary services being carried out by the WDARDO run under shortage of equipment. Antihelementics, penicillin group, tetracycline group, acaricides and vaccines are the drugs and prophylaxis given by the district office. For list "A" diseases they receive vaccines from the National Veterinary Institute for free. These diseases are rinderpest, CBPP (contagious bovine ploro-pneumonia), CCPP (contagious caprine ploro- pneumonia), sheep and goat pox, lump skin disease, Newcastle disease, African horse sickness, FMD (foot and mouth disease), avian flu and rift valley fever. For the list "B" diseases, which include those mentioned as major livestock diseases in the district, the office gets vaccines on payment from the same institute. According to the district vet doctor, the first three diseases have got vaccines. On the part of the district, there is shortage of vaccines to have total vaccination coverage as a true prophylactic intervention. Other medicines are bought from the market in Addis Ababa through bids directly by the office, focusing on broad spectrum drugs such as oxy tetracycline. This purchase used to be done through the region but some medicines thus secured were not appropriate to the district.

Farmers' objective in keeping cows was said to be largely the need to have oxen for drought power. The dairy resource of cows is highly neglected. Due to inadequate feeding, herd management and in-breeding, the yield of local cows has drastically dropped over the years. Keeping oxen is highly valued for traction power but economically, experts argue these animals consume too much fodder and caretaking. Rather, they underline better income could have been earned by selling the oxen after planting/farming season and keeping dairy cows instead. Experts also underline that converting farm fields into that of fodders could be more profitable. Farmers do not also get into comparing cultivating crops with keeping animals as in the way experts do. On their part, there is a tendency of viewing animal production as subsidiary to that of crops. On the one hand, experts appreciate that farmers of the area receive

extension advice quite well. On the other, the extension system has not been able to deliver improved chicken, AI, improved cock and others to the level demanded by farmers. What is more, even though farmers could be commended for their practice of taking sick animals to seek professional services, experts complain that priority is still given to traditional medicines. Hence, many sick animals are brought to clinics late, rendering their treatment difficult.

11.9 Conclusion

This chapter has dealt with the meanings and values farmers attach to livestock. They have a saying that *"he who does not keep an animal is one himself"*. Like crop production, for farmers, stock rearing is not only an industry. It is also a way of life. Keeping large number of animals used to be a matter of gaining prestige and influence, at times converted into economic and political gains. This custom has been under the influence of resource scarcity and government intervention. Therefore, many households currently own less number of animals though understanding has not significantly departed from the old sentiment. Theoretically, the ideal number of animals a rural household has to keep today is reached after calculating a number of factors, including economics and ecology. Animals are disposed in times of needs, including shocks, going from the smaller to the higher stock. This economic strategy still persists to some extent.

Still many wish to keep more number of animals and practice free grazing unrestricted but, keeping smaller number of stock has brought practical positive changes for many rural households. Fattening of sheep and oxen is practiced partly thanks to government and NGOs credit facilities. No matter what the slackening change in attitude, the new results are likely to be viable as far as the traditional insurance secured by keeping diverse stock is replaced by other institutions. This should not be taken to mean there is no incipient attitudinal change towards what the government is pressing to acculturate. As

a result of the change towards keeping lesser number of animals and fattening them for market, the term livestock rearing or raising, has become inadequate to express the change in practice. Since farmers have started to purchase and sale animals frequently, the term *livestock keeping* appeared to be a better expression for the ongoing newer practice.

The exploitation of livestock as resources could be compared with that of crops already dealt in this dissertation. Because of the struggle to survive, farmers repeatedly and intensively plant their fields, depleting the top soil nutrients excessively. Sometimes this had been done to the extent of rendering the field a 'waste' before soil reconditioning and bio-physical protective structures were not in much practice. Comparably, women over-milk their cows, sometimes leaving very little for the calves, especially during droughts where forage is extremely scarce to feed the mother-cows well and to find weaning forage to the calves. It could be said that the male farmer over-taxes the land in the field in the same manner the woman over-taxes the milk cow in the home. Local personification has a milk-cow file the complaint: *"wäk'ïtun aytäš ïläbiññ": "milk me only as much as the time allows"* about the woman who over-milked her during a lean moment. Livestock production is operated under different cultural, institutional and economic constraints which are nonetheless improving through time.

CHAPTER TWELVE: LOCAL AND EXTERNAL RESPONSES TO CLIMATE CHANGE AND LAND DEGRADATION

12.1 Introduction

The previous chapters have presented some of the social, economic and cultural responses to local climate change, land degradation and scarcity, both in the recent past and in the present. The theoretical stance I have taken, as stated in Chapter Three, is processual and interactive such that the relationship between culture and the natural environment is seen in an interactive rather than deterministic way. This chapter further discusses the socioeconomic and cultural responses made to cope with climate change, land degradation and land shortage; the shifts that have occurred over the years as well as future trends. I discuss how social, economic and cultural thoughts and practices are affected by such factors as demography, government policy, national and international markets, and the natural biophysical environment.

Behavioral differences result from individual perceptual and micro-ecological variations. For instance, a certain type of social response might be possible for one household whereas it might not be for another, although those both households may share similar cultural and environmental contexts. Likewise, it is true for economic responses that households make in the contexts of differing micro-ecologies. In light of this, the chapter discusses the cultural understanding of reproduction; the social organization of crop and livestock production; informal networks of exchange; use of external credit and saving; off-farm activities; labour migration; changes in parent-child relationships as well as relief aid and its impacts.

12.2 Cultural Understandings of Reproduction

According to tradition in Ethiopia, one of the indicators of manhood is fertility. Hence, having as many offspring as possible is expected of a man. The same notion of womanhood induces women to bear many children. The

cumulative effect of these institutions has strongly contributed to population increase which has been translated as population stress. One might question as to how corrective cultural measures were not taken in this regard. Analyses of the family reveal that the continuity of the individual is not to be ensured by the continuity of the larger group to which s/he and their immediate family belong. Rather, the continuity of the individual is primarily to be ensured by own offspring and secondly by their proliferation. The force of this institution is still felt. Tämam Ali, a resident of Awraççа, has two children. Despite his brothers and sisters having many children, he was unhappy that he was unable to have more children by the same woman he was having as a wife. Even though he did not lose hope completely to have a child by her, he and his wife influence their married daughter to have more children. The time he told me this, she was young and had two children already. After sometime, she had the third child. He stressed that everybody did the same so that *zär* (family line or minimal lineage in this context) is not discontinued. Therefore, the phrase *"zär ïndaïk'uarät"* meaning, *"in order not the family line is discontinued"* is frequently mentioned as an institution of reproductive behavior. Male preference, for cultural reasons, still predisposes couples to try more pregnancies. Parents also influence their married children in this regard as they do in their marriage itself though the influence of parents has significantly decreased in this regard.

A host of social, economic and political ideologies have supported these notions though changes have started to alter the course of tradition. The above cultural conceptions, along with many others, did not allow communities to practice "the comparatively low fertility of traditional Western European populations effected through the late marriage of women, celibacy, [and] contraception" (Hoben, 1973). Of course, in traditional and even in many current Ethiopian cultural contexts, celibacy is discouraged both for women and men since a person should be able to beget at least some children if not as many as possible. In terms of religion, the couple is believed to be discharging

their Godly responsibility of proliferating. This can be seen in light of the Western Abrahamic traditions of Judaism, Christianity, and Islam which holds humans above nature (Tucker and Grim, 2001, p. xx). Politically, they are building their security, especially in the case of the male child. Economically, child labor has been a traditional source of agricultural prosperity, and nowadays, remittances from around the world for both rural and urban Ethiopia. Socially, they are fulfilling their community expectations and gaining status-honor to some extent.

Many couples, however, have started using modern contraceptives, including permanent methods. The saying, *"bïzu tämaräs k'älläbïttäññа masannäs"*, which means *"it is better to limit the number of one's children rather than cultivate more land",* is a new perceptual change in this regard, compared to the old saying, *"lïğğoččaččïn habttaččïn",* which meant *"our children, our wealth"*. Children's importance is belittled in another saying, *"lïğ dïrrïs bét fïrrïss"*, which represents children as a source of family disturbance and economic burden in a tacit reference to their unemployed status after graduating from high school. While many women are said to be using fertility contraception and a great deal of men, unlike in the past, give their consent to this, factors that discourage large family seem to be as important as that encourage it, especially in rural Ethiopia. The belief that each child is borne with its fortune so that God and not parents are ultimately responsible for its upbringing and life as an adult, is still a lingering factor.

12.3 The Social Organization of Crop Production

12.3.1 Ğigi or Däbo and Täläma

Traditional agriculture abounds with local institutions in its day-to-day execution. *Ğigi* or *däbo* has been amongst them, and is affected by different social, cultural and physical environmental factors over time and space. Physical land shortage, increase in the level of public political consciousness,

the removal of domestic labor from the agricultural sector into school attendance and outmigration, and rural people's growing exposure to western cultural elements are amongst the main reasons for the reduction of the manifest and latent functions of *ğigi* in agricultural activities.

According to elderly informants, during the imperial regime of Haile Selassie and even before that, this work party used to be the principal way of organizing agricultural labor for many farming households. This was said to be so, first of all, because of the belief that the land loved or preferred to be worked by community labor rather than own labor. Men gathering for a *ğigi* will be fed and will drink at the feast to be organized by the caller. Those partaking in the service, on their part, would bless the land. The blessing is believed to be an important source of fertility to the soil to give off good, if not bumper harvest. As mentioned in Chapter Six, land that is delighted provides a better harvest. The kernel of this thinking is that there could be people who cannot afford good food and drink on their own and *ğigi* would give them the opportunity.

Second, local exegesis goes that in the past people loved each other most, each was given to the other and there was no restraint to work for others even at the expense of one's own work. Because of this, unlike today, the quality of *ğigi* labor was not that much compromised. Therefore, everyone went for it as far as he or she was able to prepare the feast (food and drink). It was said, during those days, nonetheless, just two, three or four wise men in every village were able to become rich, significantly relying on *ğigi* labor. Primarily, what was special about these men was their ability to get the labor of others in exchange for their lavishly offered feasts. In many such instances, feats were also served well after the labor was accomplished, accompanied by such merry-making as singing and dancing. Therefore, throwing at least a modest feasting is mandatory for a household to mobilize *ğigi* labor. I repeatedly observed outright rejection and a feeling of "off with him!" from villagers I

asked if they were willing to offer their labour for free. Of course, thinking to obtain it without the service is a shame.

These local exegeses seem to camouflage some aspects of the *ğigi* institution. It had an element of feudal exploitation in the guise of religion and mutual cooperation. Those who frequently mobilized *ğigi* labor further invested their profits to rent- and sharecrop in additional land. Given the availability of ample land this was relatively easy before the 1975. As such, rich and wise men were able to mobilize the extra labor within their localities to their own advantage. In the lavish organization of the feast, there was also an element of show of personal rich. This further brought prestige and influence for the organizers within their immediate localities and the higher political structures of the area. In this institution, we see two groups of people: the exploitative minority who knew how to have food and drink work for them and the exploited majority who just worked for food and drink. We also see two ways of resource exploitation: people exploiting people, and people exploiting the environment through people. *Ğigi* is more of a male domain because of the belief that "women do not bleed a job" but women do have their own work parties as in helping each other in the preparation of the feasts to be thrown for men's *ğigi.*

Villagers view *ğigi* as a voluntary, non-reciprocal work party. This shows that the food and drinks are not considered as payments or rewards for their labor. In actuality, it is difficult to view it so. Its lack of balanced reciprocity in the form of return labor is likely to be the main factor. Otherwise, apart from the food and drink paid immediately, the institution bestows on its participants a sense of generalized reciprocity. Actually, villagers' conviction that no one would give his free labor to others without the food and drink is an aspect of a balanced reciprocity.

The quality of work done by *ğigi,* compared to that done by a person's own labor, might be inferior, if there are slow-pacers in the group. There is a belief

working against them, though: it is believed they will leave their success fortune behind on the host's land. Though slow-pacing is said to be inevitable, elders said this belief used to mitigate the problem to some extent. Nowadays *ğigi* is restricted to a few difficult jobs. There is a strong pressure on every farmer to prepare land and plant on time before the moisture in the soil is lost. Given the current recurring drought and diminishing rains, *ğigi* could have been the best solution to deal with this urgency. Today, in spite of being on decline, it is re-imagined on the basis of reasons that have to do with climate change. Still there are some people who, to some extent, manage to employ this work party. *Ğigi* labor is also favored to collect harvest before it is damaged by bad weather conditions, mostly untimely or extended rain.

Over the years, this work party has been on a significant decrease for agricultural labor, agriculture, in fact, is becoming a matter of private endeavor though it is not yet deprived of its social nature completely. What has developed in tandem with this is a sense of competition among fellow farmers for survival superiority, economic betterment, status and political dominance. The concept of model-farmer, reintroduced by the current government, with reward and incentive mechanisms put in place for best performing farmers, has enticed many of them to enter a frenzied competition to ace out each other. As a result of this, local perceptions of agricultural success and failure are transforming from their religious and social bases to secular and scientific ones. For example, with diminishing *ğigi*, the belief that this institution guarantees agricultural success after the party's blessing is largely losing effect.

Ğigi could be regarded as a precursor to the food-for-work program and its variants initiated by the international donor community to prevent famine and vulnerability to it since the 1974-5 drought and famine. These programs could also be considered as new solutions to an old problem. In terms of ecological consideration, the old "food-for-work" had also been involved in the

construction of bunds that have been inherited from generation to generation. In a similar manner, the new "food-for-work" types of interventions are involved in the construction of modern SWC structures and other development works. If new solutions to old problems are feasible, it encourages us into thinking to seek old solutions to new problems as well. This could go in line with such phrases as "new models for sustained natural resource use and management" and "options for the future of the planet" made in relation to the relevance of TEK (Posey, 2004).

Täläma, the customary practice in which villagers had a ritual figure start planting during the major agricultural season, is also disappearing. Today, individual farmers prefer to have the ritual privately on their respective farms rather than wait for the ritual figure *(tällami)* to do it on behalf of the entire village. Many farmers told me that their *ïrzïk*' (fortune) would go to the *tällami,* making him richer while they go poorer. My key informant from Absaro, Hassän Usso, who used to be the *tällami* for his village, said, "Some question why would I let him become rich by having him as a *tällami* whereas I could do that myself and retain my fortune [and render him less of a success]?"[235] Here, *hisd,* which is envy, mentioned by villagers as one of their three developmental problems, factors in. There are signs that this competition has had and would have impacts on TEK. Thus, farmers are getting less morally responsible to one another and their relation to nature is becoming more individualized. This is happening with the likelihood that they would also be less responsible to nature unless immediate survival need dictates this, which is the case in present-day Gäddärro. Advanced societies' exploitation of nature and the working class in the name of enterprise is comparable with villagers' exploitation of their fellow compatriots and the land in the name of religion as expressed in the *ğigi* work-party.

[235] Interview transcript

12.3.2 Sharecropping

Mofär zämmät was a form of sharecropping arrangement in which highlanders went down to the lowlands, cleared the forests and cultivated mostly sorghum. The produce was shared on different basis. The oldest man from Mïsïräta, Abba Zoyad, believed to be well over 100 years and who died after I had some interviews with him, had practiced this form of cultivation for 33 years before its restriction by policy in 1975. He once collected 100 quintals of sorghum just in one season.[236] This and other sharecropping arrangements were employed as adaptive strategies to land shortage even though men who had the resources also did it to amass more surpluses. In the arrangement called *yäkkul*, the two parties shared the produce equally. The tenant is responsible for seeds, labor and oxen. Today, households sharecrop out land due to lack of money, labor and draught-oxen. As a rule, the tenant should also lend some money to the landlord except when the land owning party does not need this, rejecting it as exploitative, unreligious or bad to the fertility of the land. This form of arrangement has been decreasing considerably because of land shortage, increasing institutional access to credit which also enables the purchase of draught oxen.

In the old arrangement known as *siso*, the land owner got one-third of the produce, the rest going to the tenant, who was also responsible for all inputs as in *yäkkul a*rrangement. The lion's share went to the tenant to compensate for the difficult, tiresome and demanding task of taming a land difficult to work into a cropland. This arrangement was in practice till the end of the imperial regime, in the *däga* and *wäina däga* areas, including Gäddärro. It had gradually disappeared after that because of growing shortage of land and more labor to work it. The second reason is said to be the more or less equitable redistribution of land which leveled land holding with family labour. On the contrary, in the low lands where there is comparably large amount of land,

[236] He and men like him were said to hand out food to the famished for free.

siso sharecropping is still in practice to some extent, also involving highlanders, mostly through friendship and kinship networks.

In *gämït'oš*, probably the oldest arrangement, the owner of the land, as in all the rest, borrowed some money from the tenant. After the creditor has cultivated the land himself, for agreed number of years, he left it to the owner. Until the debt was repaid, however, the tenant retained the right to cultivate the land. If the landlord was unable to repay the debt further, he would negotiate with the creditor- sharecropper upon which he could regain some part of the land, whereas the tenant continued working the rest of it until he was fully paid. This arrangement was the first to die out of impending land shortage and as part of local socioeconomic adaptation to it. Ample land and labour shortage were the most important factors in its support.

The arrangement called *yäçïnät (yäçïnät bäré)*, took place when a farmer lent his oxen to others (usually lowlanders) in exchange for cereals, mostly sorghum. This arrangement eased shortage of labor in the lowlands for land preparation during February and March, for planting during April, and for *šïlïšalo* (cultivation) in May. The owner of the ox could take two *dawïlla* and one *k'unna* (about two quintals) of grain crops for one season's service of his oxen in these activities. If the service is just for *gïmïša,* the payment would be just one *dawïlla.* If it is for April planting, he would receive 15 *k'unna.* This practice has benn there since the time of the imperial regime but it is nearly out of practice presently. Payment is not made if crops are damaged by climatic vagaries. However, there is a reduced, yet altruistic or moralistic and symbolic payment known as *yäbäré dänïddäs*, meaning ox wage even during significant harvest reduction, which is also supported by social pressure.

A farmer will plant eucalyptus trees on the land of another farmer which he protects till the trees reach harvest stage as a *magär* (rafter) for house construction. In this arrangement, the two persons equally share the first harvest after which the planter would live the trees completely to the owner of

the land. In case of *çat* and coffee fields, the labor contributing farmer takes the responsibility of cultivating, weeding, and watching the trees. The produce is shared equally. This practice existed since the last period of imperial Haile Sellassie regime, but nowadays it has become on the decrease. There are also farmers who contribute their labor to pick ripe coffee berries in exchange for a kilo of coffee for the same amount of berries collected. This is also a rare phenomenon nowadays.

In all of these, land owners prefer to sharecrop-out their lands to non-*gosa* members, non-kin and to residents of other villages. The reasons for this are (1) people external to the village prepare and plant the land on time; (2) they submit a better amount of cash in the form of credit, satisfying better the financial needs of the land-owning partners; and (3) they provide the land owners with extra labour and small gifts. On the contrary, relatives and co-villagers are said to be less concerned to deliver obligations and expatiations. Tenants coming from other villages feared being sued; relatives and co-villagers relied on the *gosa* protection to preempt this.

12.4 The Social Organization of Livestock Rearing

The social organization of livestock herding, apart from the basic need of subsistence, is governed by many other factors, including politics, culture and the ecology within which it is practiced. During the feudal period, livestock rearing used to have the quality of client-patron relationship. Ecologically, my informants said, lowlanders occupying a wide expanse of land had better capacity of carrying more number of livestock than highlanders. Hence, there was more livestock flow from the highlanders to the lowlanders. The following institutional arrangements were largely practiced until the feudal period. Generally, they are said to be made between the ‘haves’ and the ‘haves not’. Until the downfall of the *dergue* regime in 1992, these livestock rearing arrangements were largely practiced in Gäddärro and the rest of the district of Wärräbabbo. Their attrition, however, had somehow started before that.

Today, these arrangements are quite few, and only when other means are exhausted do rural households, mostly the poor, resort to their recourse. They are *yällabi, yägärafi, yärrïbbi, and yäçinät*.

Through the arrangement known as *yällabi,* the livestock owner transfers a heifer or a cow to another person to take care of the animal in exchange for milk and milk-products. At the end, which could be a pre-specified period, the owner takes back the mother animal and its offspring. The arrangement, *yägärafi,* takes place when the owner of a male calf, a bull or an ox, passes over his animal to another person with full responsibility for its up-keep in exchange for its traction power. By the end of the agreement, the animal will be returned to its owner. In *yärrïbbi* arrangement, a female livestock is transferred to a person taking the responsibility of raising her and her future offspring. Both parties share the offspring, the milk and milk-products equally. Finally, the mother cow is returned to her owner.

Currently, these institutions are dying out primarily because of ecological reasons such as shortage of grazing land, depletion of animal feed and the restriction of some hills from livestock and some socioeconomic factors such as better access to government and NGO credit services. According to my household survey, 23.48% of villagers have kept other persons' animals during the three years preceding the survey (My survey, October 2009). On the other hand, 15.90% of villagers had given some animals to others in the same arrangements during the same period. As in the case of sharecropping, this shows that the transactions cut across villagers, including those living in lowlands and highlands. A closer scrutiny at these "dying out" institutions, as in the case of crop production, reveals how economic and related practices are influenced by changing ecological and socio-political circumstances. The more or less equalizing political measures effected by the *dergue* regime and those taking place since, have largely leveled out economic opportunities for farmers, including size of herd. Rise in the level of political consciousness of

farmers, from the micro-politics of individuals to the macro-politics of state administration, has its own impact here. Moreover, through different forms of oversees development assistance, including emergency relief aid, there has been good amounts of resources flowing into the country from the developed ones. The World Bank and many bilateral and multilateral donors play significant role in this regard. Farmers have access to these resources in the forms of credit, training, input provision, payment for work done and some direct support (free provision) to improve their living conditions and support agricultural investment and off-farm livelihood activities. Thus, a poor or financially broken farmer can finance the purchase of an ox, a cow or smaller animals instead of getting into these traditional arrangements currently complained about as being exploitative. As a result of the institution that discouraged working for others and upheld working for the state, getting into the old arrangements is also considered the least preferred option. Several national credit and saving institutions, including those organized along ethnic lines (Amhara Credit and Saving Institution), and NGOs (national and international) have contributed their share in this regard.

To some degree, extension education discouraging large animal size has its own contributory effect. Change in the land tenure system, more ecologically conscious policies and their accompanying restrictive regulations, though not universally and strictly implemented, have some cumulative impacts on the declining number of livestock raised per individual families. The restriction on free grazing since about 2004 is an epitome of government policies influencing livestock rearing by smallholders. Most of all, reduction in the affordance of local ecologies, is accounted by local residents as the most restraining factor. A group of young men I talked to in Awraççа openly stated that where a farmer fails to receive government advice to reduce stock size, necessity will have him do so. Here, necessity is locally interpreted as a time concept epitomizing all social and natural ecological factors, primarily

population pressure and land shortage. In the typical local parlance this is part of what is stated as *wäk'ït.*

It has been stated in the previous chapter that *gosa* members contribute some money to compensate for the damage incurred on a member because of the death of livestock. Instituting controlled grazing and providing veterinary facilities, potentially reduce this social pressure. This process, in addition to those discussed in the previous chapter, is expected to make livestock herding, predominantly, if not fully, one of a private venture in the future. In view of this, it is enticing to predict that the more agricultural activities are privatized, the less their organization and natural resource use would remain under the dictum of local institutions. The following exert from a group discussion reflects changes in the social organization of traditional livestock management over the past three regimes. The changes were summarized as follows by Ali Abdi, from Awraççа:

> All the livestock we have now existed in the past; of course there were many mules and horses than today. Then, there was no problem of grazing land. In the past, we used to have more of goats than today. Of course, today there are American cows and hybrids. During July and August they used to eat *gäläba* [hay] and weeds. Then, after the crops were collected they were to be free grazed until January where *bïllagi* planting began. They were put under rope when necessary just for some part of the day. Today, we do that all day long. In the past, every village had *käbït massämaria* [communal grazing land]. Now we do not have that. Some rich farmers used to keep their livestock with other herders on different arrangements such as *yällabi, yärrïbbi* and *yägärafi.* Otherwise, everybody tended his own animals by himself. Generally, we do not have these arrangements now. Now the credit service from government has helped people to have their own animals. Thus, there are no people who give animals and who receive. Those who used to receive were the poor. These institutions stopped after the fall of the *dergue*.[237]

This text needs to be evaluated against the findings of my household survey regarding livestock production nowadays. It is true that the social arrangements made around livestock are decreasing, but some of them are still in practice today as the household survey reveals. Many old institutions had the role of encouraging farmers to herd large numbers of animals. Today's

[237] Interview transcript

institutions publicly denounce this. Hence, they seem to be motivating farmers to adopt a new behavior compatible with the new socio-ecological environment in which herding has to be accomplished. In this line of analysis, it seems safe to generalize local sayings of economic practice and resource use are among the cultural ways people try to adjust and readjust themselves to changes in their social and natural environmental settings. The saying, *"Yäkäbït bïzatïnna yägïrar at'ïr anïd näw"*, compares large size of animals with an acacia fencing which does not stand termite attack and is doomed to destruction soon. Small number of animals is thus upheld among smallholders today. In the face of this, one might ask, why then a negative public attitude and dissatisfaction with state measure that restricted free grazing and encouraged the practice of stable feeding instead of it. Or, why are farmers not happy with state counsel favoring small animal size as against large size? Based on the indirect evidence I have tried to build, my inference is that there exists a virtual convergence between the folk and the state ways under question. The divergence, in this regard, seems to be one of strategy rather than purpose. The local strategy requires long time to revise its cultural elements and test new ones unlike the state strategy which is pressured by the need to bring big leaps in a comparably very short time horizon.

12.5 Informal Networks of Exchange

The degree of disaster vulnerability of rural households is different within and across communities. Even though major crisis events affect communities at large, there are still a few households that survive major crises such as the 1973-4 and 1984-5 famines on their own resources. For instance, the different sharecropping arrangements discussed provide an opportunity when households are faced with shock. The same is true with livestock. What is more, during stress, rich households lend grains and money to affected households. Traditionally, this mode of coping used to be of high importance but recently it has been decreasing for a number of reasons, including the high

percentage of households affected and the lack of households harvesting as profusely as in the past.

Today, because of land scarcity, there are fewer households becoming rich by working just the land, harvesting as much as 50 or, 100 quintals of cereals. Currently, not more than 5 or 6% of households in a community could tide over the year and keep old stock to the future as in the past. Even though I have seen some of such households lend grains and money to their threatened co-villagers during drought time, because of the reasons already mentioned, it is less reliable. Secondly, there is formal relief aid distribution executed by government and NGOs to which all of the affected could have access, including the rich, though their adequacy and timeliness are far from being satisfactory. Thirdly, rich households feel less morally obliged to help out the poor. Fourthly, many households divert institutional credits into emergency food as in the drought of 2008. Finally, some households rely on remittances sent by out migrating members.

Networks already discussed in this chapter around crop and livestock production used to be strong traditional coping mechanisms to deal with minor stresses and major crises. It is stated that many highlanders went down to the lowlands to cultivate their ample unused land, including the clearing of new land, resulting in huge amounts of harvest. During lean moments, many highland households sent their livestock to their relatives and friends in the lowlands, until there was sufficient rain and forage, and so did the lowlanders. I found a few households in the 2008 drought, which sent part of their animals to the lowlands in this still surviving traditional coping strategy. Still lowlanders have better size of uncultivated hill lands for their animals and controlled grazing is not yet instituted there. The major crop grown there is sorghum which provides ample piles of stocks as livestock feed. The growing rural market over livestock feed has made intensive this lowland-highland transaction, particularly in such drought-affected moments as 2008.

The major reason that causes lowlanders to grow much of sorghum is the hot lowland climate--the difference in local agro-ecology has created the opportunity for a form of complementary strategy between highlanders and lowlanders. Traditionally, there used to be intensive bartering between them. Lowlanders produced much coffee and sorghum which they exchanged for beans, peas, oats and wheat with highlanders. Lowlanders are also remembered for vending coffee among highlanders in exchange for grain crops. Today, this form of exchange is said to take place to some extent at Bistima, Goha and Bokoksa markets, especially swapping beans with sorghum. The overall reduction of *per capita* grain harvest in the lowlands and the growing ability of highlanders to produce sorghum because of increasing temperature are among the factors for this reduction.[238]

Anderson and Johnson have documented the importance of such network contacts among the Tugen who descended with their livestock to the lowlands of Baringo and the Tugen hill cultivators in Kenya who remained in the highlands when the rest moved down at the turn of the century (as cited in Johnson and Anderson, 1988, p. 7). Notwithstanding this, these writers document, as in the case of Gäddärro, "for most societies in northeast Africa the most important ties are those which build outwards, linking with neighbouring societies, in neighbouring ecological zones" (as cited in Johnson and Anderson, 1988, p.7). This interdependence served as insurance against environmental vagaries. Due to the experience that one ecological zone is affected by natural disasters whereas the other is not; this has been sought by African societies as a traditional coping strategy (as cited in Johnson and Anderson 1988, p. 7). Therefore, it is interesting to note that ecological variability among neighbouring communities could be used to adapt to ecological vagaries. This is exactly the same as the analyses of one of my

[238] There is still economic relationship between these agro-ecologies in the district though transactions are nearly completely made on cash in the markets rather than bartering.

informants in Awraççа made in relation to the 1984-5 drought and famine. (See Chapter Eight for detail).

Both the inward and outward dependencies of these traditional societies have undergone changes, because of the same social, political and ecological factors which necessitated them. Sharecropping, bonding of livestock, sharing labor, lending money and grains have just some degree of importance the more shortage of land, drought and ecological problems are repeated and expanded in their geographical reach. Of this, Anderson and Johnson remarked, "The greater the geographical extent of any disruption to rural production the greater the strain placed upon the networks linking societies together" (as cited in Johnson and Anderson, 1988, p. 8). Governments and the international community have been trying to supplement this through formal relief aid resources and economic cooperation. The importance of ties that build outwardly is part of the current globalizing process.

12.6 Local Tradition of Saving and Emergent Changes

The hungry months of the year are also those in which villagers demand credit for their food provisioning. Villagers lend to one another money and food grains without interest. For instance, during the 2008 lean months, a man in Mïsïräta lent 5-10 kgs of maize grains to about 10 people in this village. All paid him back at the *mähär* harvest in maize, wheat and teff grains. Some of the same people asked him for the second time but he was no more willing as he was going to sell his surplus produce on the market. According to my key informants, in Mïsïräta only five households are identified as being able to survive full year on their own produce. In Awraççа there are three such households whereas in Absaro there are four of them. These households sold their surplus produce on the market. They are also the main, in fact the sole, source of local credit. Therefore, since local sources of credit are not sufficient, demand is being satisfied by different external credit institutions.

The typical traditional way of life in Ethiopia is worried less for tomorrow than for today. In Gäddärro, highlanders are represented as more prudent than lowlanders. There is a local saying, *"yäk'ont'abi gäbbabbät t'äbt'abi"* which has been encouraging people to be extravagant rather than economical. Villagers underlined this as an impediment to saving. The saying is based on the risks and uncertainties of life, especially of the future. Thus, it had been encouraging villagers to use up whatever is at hand to satisfy daily requirements. In more direct language, this means, if someone saves today, he might die tomorrow leaving it behind for others, including those who would not deserve it. This explanation was also supported by the ironical statement that the poor are fed better than the rich. It is said the rich saves today for fear that there will be a shortage tomorrow, running the risk of dying before eating what is saved. Moreover, in the traditional sense, saving is like meddling in God's affair (who is responsible to fend for tomorrow) in addition to being a sign of meanness and asocial demeanor. One of my elderly informants remarked, "If the person keeps on saving what God has given to him, in defiance to His order, God will not deliver to him any more since the person should rely on his saving".[239] In the typical traditional way, the poor man instructs his wife to cook for the day everything available, a tendency reflected in the local saying "*amot'at't'äš gagïri sïnt alläw fät'ari"*. On the contrary, the rich person instructs his wife to save food because he might have unexpected guests. This risk perception is extended to the field of livestock rearing as well. In the same manner, rich person's livestock are said to be less fed than that of the poor person. Thus, his animals would be more susceptible to impending drought for not being well-fed during good times. This local interpretation is comparable to the saying *"dïhïnnät yït'afït'al"* which means *"poverty is sweat"*.

The poor man's theory here could be an ostensible excuse. There is an undergoing change in their thrift behavior. Probably, there has not been yet

[239] Field notes

counterpart lore to express this emerging behavior. Both in percept and practice, there has been a significant change in favor of saving due to the combined effects of land degradation, frequent food shortage, unreliable market as well as government and NGO interventions, including credit and saving micro-finance interventions. Until 2009, 40 youths in the three ethnographic villages I studied were given some institutional credit. These are unemployed and underemployed youths, including those who graduated from grade schools and were unable to join college or find a salaried job.

Writing of the problem of the tradition of saving in Ethiopia, Daniel has said,

> The society does not consider the process of saving and investment as a virtue. The squandering of income is a common phenomenon among the elite and the common people. Traditionally, the imperial elite squandered their wealth on lavish palaces, churches, monasteries, gifts, entertainment and European furnishings rather than investing in technical innovations. The common people emulated their leaders through various mechanisms of wasteful consumption despite their meager incomes. (Daniel T., 2005, p. 24)

Today, as already said, the role of the state has changed so much compared to the feudal time. Donors and NGOs have better record of involving in development interventions. At community level, as the case of this research depicts, there has been an immerging and improving saving tradition though the dependence on international relief and development aid seems to have increased rather than decreased. The next section deals with the role and the significance of the market, external credit and saving institutions as part of state and NGO economic response to environmental problems and rural poverty.

12.7 Use of External Credit, Saving and the Market as Coping Strategies

It has already been discussed in Chapter Eight that during the 1973- 4 famine, villagers were unable to rely on local markets. They did not have saving to purchase though market prices were in their rock bottom. Money circulating among rural communities was also limited. What was taking place during the drought of *bïllagi* 2008 was quite different. Here, I shall treat the role of the

market and the impact of the international community on how local survival mechanisms could be influenced by external factors. In addition, I will dwell on price rise for basic commodities as well as drought and smallholders' market behavior. During and following the destruction of *bïllagi* crops in that year, the price for grains and other imported basic commodities went up. In Mïsïräta, there were four stores run by resident private traders. They bought maize and wheat grains from wholesalers in the town of Haik, who themselves purchased them from the surplus producing zones of Gojjam. The four traders sold back these grains in Gäddärro at a premium taking advantage of scarce supply and high price at the local markets in Hamusit and Bistima.

One of the four traders, who I interviewed, said that when the major rains started to fall during July, the volume of purchase by farmers had drastically dropped. He added that even though the drop in the market price was not that significant, he was expecting farmers to go for a more purchase of grains. Nonetheless, he said that he took what was happening as an epitome to strengthen the rumor that farmers were indulging in advance purchase to secure existing stock for later days. My informant added that money released by government (credit institutions and NGOs) into the market was high compared to the past, contributing to increased purchasing power of the rural population. In this regard, money secured from the World Bank, saving and credit institutions and donors through government channels were mentioned as important sources of cash flows. Farmers were also diverting these credit proceeds to purchase their provisioning. Coupled with the increasing practice of growing cash crops, especially *çat*, oranges and the tree eucalyptus, farmers have more supplies to be marketed than before. The analysis of this young man went to the extent of saying that as more money has reached the rural population; its purchasing power has declined.

The drought of *bïllagi* 2008 was also said to instigate further fear that the main rains in July would fail to affect what was planted during April. This is also mentioned as another factor for advance purchase. Of course, these rains did not come as early as usual and in the worst cases fields with long-cycle crops had to be overturned and replanted with awn crops (e.g. wheat). That animals were also affected by the drought had fueled fear and uncertainty. However, there was some hope when the major rains were started after some delay and crops recuperated, especially awn crops which were in their best in recent history. This reduced drastically the level of speculative purchase. In the face of this hope, if the thriving fields were to be endangered by unexpected environmental risks, farmers would once more get into a state of fear and concern. Those still with money would further visit the markets. The role of ecology is prominent as getting rains and good performance of crops in the fields create the perception of a food-secure future, also affecting market behaviors. Therefore, the expectation that a given community will fall into hunger or famine needs to be seen in relation to these factors emphasized by my informant. The case reveals that drought and rain, hunger and enough food, are related not only to production but also anticipated production and saving, the market and international cooperation. The normative tolerance to market deterioration until there was nothing to be supplied to declare famine is being replaced by such individual disaster prevention and preparedness mechanisms.

The trader I mentioned above had 100 quintals of maize in his store the time I interviewed him but since the demand for grains had decreased, as it was already mentioned, he was unable to sell them off even at rates below purchase. The role of such traders in accessing food to the rural communities during scarcity is tremendous. All the same, when the market suddenly works against them, they are doomed to crises but there is no institution to insure them against such an expected tide. Apart from this, transferring entrepreneurial and managerial skills to such rural traders could boost not only

their coping ability but also that of the entire community. Such measures would increase the contribution of emerging rural entrepreneurs in the positioning (or prepositioning) of highly needed food and other commodities to the rural population. Attention needs not to duplicate farmers' service cooperatives but to supplement the market as well as government and NGO intervention in this regard.

Currently, farmers judge their relations with government as one of unprecedented source of cash flow to the rural community. My household survey revealed that 45.38% of the surveyed households had cash credit access from government and non-government sources during the three years preceding the survey. These credits are provided in order to strengthen and diversify the livelihoods of rural households as part of the development strategy of the government. The institutions delivering these credits were farmers' service cooperatives, the Amhara Credit and Saving Institution, a World Bank Project and a Food Security Project. These formal sources of credit were accessible to men, women and the youth. Most of the credits thus received were used for the purchase of oxen, constituting of 48 (seven FHHs) borrowers out of a total of 59. Ten households have used the money for the purchase of sheep and goats while those receiving the micro-business development credit were just three male headed households. Petty trading and farm implements purchase are also in the schemes.

12.8 Sale of Crops and Livestock

Most farming households in the research communities cannot sustain their food provisioning for the whole year from their own produce (at most only about 5% of households can). This does not mean that those with shortfall do not visit the market with their produce. In order to satisfy their petty-cash demand for the provisioning of basic commodities and other needs, nearly all households visit the market with at least an item. This is true particularly during harvest seasons even though market prices are quite low and they had

to re-visit the same markets for same supplies later in the year when prices are quite high. In 2007, I arranged with a man from Awraççа to visit the nearby market of Hamusit in Goha--days before that he told me that he was visiting this market to sell grain crops. However, when the day arrived he only took about four or five kg of grains with him. Given crop shortage, livestock has become the main source of cash for many households. The reduction in the number of livestock might affect this opportunity unless their productivity per head continues to be improved. Decision-making over what and when to sell is largely a matter of joint men-women consultation. If a man wants to sale an asset against the will of his wife, the latter has all the legal means to prevent him from doing so, including putting him under police arrest.

12.9 Local, National and International Labor Markets

Land scarcity and continuous fragmentation has resulted in the cultivation of marginal lands and the conversion of pastureland into cropland (See Chapter Six for discussion on this). This problem, which has been intensifying over the last half century, has resulted in a landless class of young people all over highland Ethiopia. As parents are unable to provide their marrying out children with adequate initial land from their holding, neither are local government structures responsible for the administration of rural land able to address the need adequately. In this regard, James McCann said, "The result was a new *disinherited generation* [my emphasis] reaching marriageable age that resorted to new forms of marriage and household formation" (1988, p. 295). He also mentioned of young Christian highlanders in Denki, Shoa, moving down to the lowlands to sharecrop on tenancy arrangement. This was just one among different coping strategies used but their efficacy is never immune to the test of time as it is already discussed in this chapter. This highland-lowland interaction was rendered impossible because of policy restriction and ecological factor of land scarcity in the lowlands of Gäddärro.

Not only is the property concept used by McCann apt to describe the situation. Also in order is the concept of movement. Against the traditional background of immobile generations, newer generations on the move are set in. Currently, as I observed in the field, young people employ every conceivable means of transport to leave the country in search of survival opportunities. Even boarder restrictions and policy measures have not deterred them from traveling dangerous wilderness and sea voyages involving deadly risks. After this entire ordeal, many have arrived in their dream lands. In consequence, not only has this affected the traditional household and family structures and the associated social relationships. It has also altered parent-child responsibility as parents have to sale their productive resources, use their savings and even get into debt to finance their children's migration. Children, on their part, had to bear the brunt of hard life on foreign land, working mainly as housemaids and shepherds so as to be able to remit money and send commodities to their expecting parents and relatives back home. This is just part of the social strategies Gäddäroans, as do many other rural communities in Ethiopia, employ to adapt to economic and ecological crises in their recent history. As a result, not many young people currently envision marrying locally and building their fortunes at home. This is a moving generation even when seated, preferring to talk more about the attractions and fortunes of cities and foreign land than the traditional rural homeland.

12.9.1 Off-farm Activities

Petty-trade in such fields as running shops, flour mills and restaurants as well as retailing cereals, *çat,* orange fruits, salt and kerosene form the major strategies of off-farm activities. Carpentry, masonry, weaving and basketry serve the purpose at a very less extent. Some households have traditionally been engaged on pottery, tanning, metal and woodworks, mostly producing agricultural tools and household utensils. These activities have been performed in addition to farming. In spite of their insignificant number,

splitting timber manually is emerging as an important source of off-farm activities, especially for young men, although its long-term ecological implications could out way its immediate economic benefits unless supported by strong reforestation. Mïsïräta, once one of the two centers of villagization in Gäddärro, and the seat of the FA administration until now, is emerging as a hub with some modern features, including government services. This is also owing to the all-weather gravel road passing through it, linking this part of the Amhara region with that of Afar. These income generating activities, though inadequate, are tried by a growing number of rural households along with the increase in the problem of land degradation and shortage.

It is not common for local residents to work as day laborers in their localities because of cultural taboo that discourages this. Nonetheless, they admit that their life is sustained primarily on the sale of their labor in the context of labor-intensive public works financed by government and international grants. These include such works as SWC, tree planting, rural roads construction and rehabilitation of public service institutions such as schools. Indeed, I have observed a number of people working for their co-villagers on payment. Processing mud and plastering wall are carried out by some men within and outside their immediate localities. Most of the women carry out petty-trading in such items as chicken, eggs, salt and kerosene throughout the year. This could be regarded as the start of breaking with norm because of survival necessity. The institution in which impoverished households dedicate the labor of their children to well-off households on a long-term basis in exchange for annual cash payment was a source of income for some households in the past. In this arrangement, the child was fed by the employing household who also covered his or her clothing expense once or twice a year. In spite of the experience that this institution has been on the decrease since the end of the feudal system, there still are a few children living under such

arrangements.[240]According to local residents' estimation, the majority of households supplement their living through these off-farm activities, especially during slack agricultural seasons.

12.9.2 Day and Internal Migrant Labor

At least over the last three decades, labor migration outside the district of Wärräbabbo has become an important strategy to deal with livelihood problems and expand one's growth opportunity. Young men and women invariably migrate within the country, especially into the adjacent regional state of Afar to provide semi-skilled and unskilled services. The most important centers of day-labor attraction in this region are the towns of Afd'éra, Logia, Aisaita, Çïfra, Ailé Wuha and the Afar regional seat, Dubti. Most of the casual labor opportunities exploited are construction works (masonry, carpentry); extraction of salt; bakery, firing charcoal and agricultural labor such as weeding, cutting and threshing sorghum as well as shepherding.

In the household sphere, young women are employed as domestic servants. In the same way, young men are also employed as domestic aides, such that there is very small gender difference in this regard. Bars, restaurants and tea rooms also present additional opportunities, especially for women whereas the men join in the women in serving as employed shopkeepers. Vending iced cream under the scorching heat of Afar is another income generating opportunity. Plastering wall with mud is also another activity. At the 2008 rate, generally speaking, for a day's labor, a carpenter was paid ETB 40; an aide to a carpenter ETB 20; and a mason ETB 50 to 60. Some of these temporary migrants could work from months to years, at times sending remittances to their parents, changing towns and coming back to join their families for a brief or prolonged period, after which they would go back to

[240] Herding and field labor are the main responsibilities of those engaged in this arrangement. During the period of my research, from ETB 400 up to ETB 500 were paid for a year's service.

these places. A small number of the migrants also start up small businesses such as bars, restaurants, inns and shops, increasing their chance of establishing a permanent living in the new places. Socio-economic interactions thus created between the neighboring people of the Amhara and the Afar, at times culminate with intermarriages. There are also highlanders who marry among themselves while they are in the new sites, some coming back with their children to live in their societies and others remaining there, further intensifying their integration.

A young man who worked in Afd'éra and Logia for about four months back in 2004 as an aide to a carpenter, came back to his home village with a net proceed of ETB 600 at the rate of ETB 15 per day. Another young person, engaged in salt mining from salt water in the same place and as an aide to a carpenter in Logia, came back with ETB 1,000 after working for five months at a time. The inhospitable hot environment of Afar and such diseases as malaria are said to be ravaging. Many complained about it that it has to be a last resort. In spite of this, once a person has experienced labor migration to even harsher areas such as Mättämma and K'uara, bordering the Sudan, villagers said it is very difficult to have the person stay behind. Internal labor movements are not only sources of income for the youth and their families. They also help to decrease the pressure on the environment back home as do past and current land settlement programs. Therefore, even though their impacts do not appear to be significant, they allow some vent to the increasing problem of land shortage.

12.9.3 Overseas Labour Migration

Skilled, semi-skilled and unskilled labor migration to Middle East countries, including Saudi Arabia, Qatar, United Arab Emirates and Lebanon are made by young people from different parts of the country. Most of these journeys are reportedly done through illegal routes and arrangements since the ban on this form of labor migration some years ago. Especially those made to the

Sudan, Yemen (as a transit) and Djibouti, involve risky ordeals that fortune seekers have to undergo before reaching the place of their 'dream economy'. Several young men and women from Gäddärro, including villages not covered in this research, have taken to these places mainly to serve as household servants and shepherds to their Arab employers. Shepherding is said to be largely carried out by young males. In an exceptional household I have heard seven children had already left. The present-day generation of these rural areas has its heart and mind set on these external opportunities.

Out of the four young men I talked to in a group discussion in 2008, all of whom had experienced migration to Afar region, all but one had further ambitions to go out, obtain whatever work was available to begin a better way of life different from their parents and forbears. Saving money, starting up business and establishing life in towns were their additional priorities. One of them openly cried, "What good have our fathers' homesteads done for us?" Another young man added, "Look, you see everything here. What have we to benefit from it? If we die, it is a death we do not deserve. No worldly comfort; no heavenly reward. We loose on either side."[241] Just one of them was concerned that as he is the breadwinner of the family on behalf of his dead father, he would not fetch happiness leaving his father's homestead behind. The others expressed their wish to go to the Sudan, because a new opportunity was reportedly opening up there. They told me the story two young men of their age from other villages who managed to get there, worked for five months harvesting (cutting and collecting) sorghum and came back with a fortune of ETB 10,000 each. If what is reported is true, this country could yet be another foreign attraction to many young people in the area.

Land shortage and insufficient off-farm activities, in the eye of this group, render their locality good for nothing. Whatever is harvested does not carry over their families throughout the year; leave alone provide for financial

[241] Interview transcription

demand of the youth. Therefore, the need to support their parents economically was mentioned as one of the main reasons that induced them to leave their home-base. Mostly the women send remittances and material gifts to their families even when this is meant compromising their needs. Generally, men do not fare well in their support to their families. I heard a father talk about his daughter who took to Jeddah before four years as a housemaid, asking him by phone to divert the money she sent home to buy her house in Bistima, to their food provision to survive the drought of *bïllagi* 2008. Another young woman sent her father about ETB 20,000 to undergo surgical treatments at a private hospital in Dessie. This relation also involves sibling- to- sibling support. The prophecy: "those who do not plant eucalyptus and beget a female child shall repent" is said to be revealing. Young men are no more bound to their home village by tradition (I have given a discussion of this in Chapter Five).

Finally, it should not be forgotten that no one is interested to lose contact with the home base where they want to erect extra-houses (for their parents and for themselves) as a contingency to deal with the uncertainties of life in other places. The saying, *"näfïnnafa suri näfïnnafa wänïdi mïnnïm bibbädäl tagär ayhédi"* expresses the status of those who stay behind permanently whereas another saying, *"šäk'k'ïlän šäk'ak'ïlän ïnïgïba agäraččïn ïnïdäwwät'u k'ärru ayibäl tälattačïn"* states the ultimate come back home of those who migrate out. Warfare, resistance movements and the conscription of especially the young have been additional causes of agricultural labor attrition. What is more, McCann writes that the departure of the young across borders in search of better life was also an old phenomenon. Of this, he wrote, "I would argue that such phenomena are far more the result than the cause of productivity decline" (McCann, 1991). According to my research, both ways count.

12.10 Changes in Parent-Child Relationships

Children have long been a major source of labor and old-age security to their parents and families. During the feudal times, children also supplied forced labor to the ruling class in lieu of their parents. Hence, the apt saying: “even a female donkey is spared from burden for begetting offspring”. This institution is likely to have encouraged population pressure. Children of both sexes also serviced in labour the tax arrears of their parents. While this form of relationship was removed by policy with the abolition of forced labor during the period of Haile Selassie I, the practice had survived until the 1975 Land Reform.

In all the political systems considered in this research, fathers customarily earmarked some plots of land as a start up resource (*goğğo mäwça*) to their marrying out children, especially sons. Officially, however, the ownership of the land remained with the parents, who were also responsible for paying the taxes. If a father died, the title deed was transferred to the elder son in the family, who was made responsible to pay the tax and not the mother (even though women had the right to do so). In the feudal times, fathers had the right to reclaim any land thus given over to their children. Children who were in good terms with their fathers pulled their labor together with their fathers after starting up their own families for some years. The sharing of the produce, which was never equal, was made on the basis of either *ïrïbo* or *liğïbäll*. Under *ïrïbo* the child got one-fourth of the produce whereas in the case of *liğïbäll* he took one-third of it; the rest being appropriated by the father. With the increase in population and growing land scarcity, parents’ ability to provide for economic amount of land to their children has diminished drastically for some and has become impossible for the majority. Even though the 1976 E.C. Land Redistribution made in the district and other places had meant that every child in a family has its share (though a meagre

amount), which it could pull out at marriage, in practice, many young people have opted for other survival mechanisms.

Lineage as an institution of continuous spatial ownership over agricultural land between male and female descendants or kin groups used to maintain such groups as solid social entities. The legal acceptance and hence economic superiority enjoyed by 'heads' of lineages as the sole legitimate taxpayers on behalf of the lineage or the village corporation gave authority to lineage heads over their members. The harmony thus created between government and its subjects at a macro level was more or less repeated between lineage heads and their members at a micro level, contributing to local order and political stability.

Formal education that has been started in the last decade of the 19th century in the capital and some other important provincial cities had over the years expanded into different parts of the country. Even though the imperial regimes of Menelik II and Hale Selassie I had achieved commendable efforts in this regard, there has not been times in the history of Ethiopia as the last four decades in which formal education has been expanded across the country. Today, there are functional government schools even in the remotest rural villages. Accordingly, in Gäddärro, as in many other rural places, formal education and school participation have become factors differentiating the long past from the present. With regard to formal education, the past was devoid of it whereas the present is dominantly one of it. Notwithstanding some adversary remarks, on the whole, education is regarded positively. That is why almost all parents send their children to school, though out of necessity, they might still be a cause for absenteeism and dropout. One of the older men (70) in Awraççа recalled, "There was no formal education in our homeland. When I now send my finger forward to print a signature, I would have burnt the tomb of my father had formal education been there the time I

was brought up. For all that I know I am sending all of my five children to school now".[242] In 2009, his eldest son left to attend college education.

Because of school attendance, including college and university education, and urban employment afterwards (for some), children are no more the source of labor to their families as in the past. It is true that the general aversion of the youth to agriculture and rural life has its own impact. Most of those going back to their villages are less interested and less knowledgeable in farming. Nonetheless, parents' determination to educate their children, though at times discouraged, has become an important cause of sociocultural change. The role reversal that is taking place currently between parents and children is so paramount. My field observation abounds with old men and women, including retired people, looking after animals as children go to school and had to take time with their educational activities during holidays at home. Education has become a new social goal that looked across farming and rural life for the young generation and for their parents who send them to schools. It is part of their reaction to climate change and land degradation.

It might come as a paradox that a country of more than 80 million with 85% of its people living in rural areas could still face a lack of agricultural labour. Lack of labour is mentioned by many villagers as one of the challenges for rehabilitating and conserving the agricultural resource base. While some of the reasons given by farmers are obviously ostensible, others are appreciable difficulties facing societies on the edge of transition. In a family of six or seven, it is not uncommon in Gäddärro to find just the husband and/or the wife being the sole work force of the family. This is partially caused by a large youngish population and partially by modern education and out migration which have disturbed the family labor structure. In households where the demographic structure is no more a problematic labor factor, modern education and the style of living and purpose in life associated with it

[242] Field notes

have taken away adolescents and young people of working ages away from agricultural labor. Apart from demography and education, exposure of the rural youth to urban amenities and a syndrome of idle mindedness are forming a youthful sub-culture dedicated to leisure. There is also indication that modern education has played an important role to the formation of a generation that has been distancing itself from local agricultural knowledge and skills, which on top of the said lack of vision to life as a farmer, could hamper the transference of TEK and belief into the future.

Thus, the labor constraint at household level is also a potential threat to labor intensive agricultural and environmental conservation practices. Many farmers complain that they are unable to build the standard government-introduced rainwater harvesting ponds on a one-man family labor though I did still observe a number of them accomplishing this task through their children's and their own labor. While this holds true for some households, lack of determination for work or straightforward "*sïnfïna"* (*"*laziness") as farmers themselves say it is additional social problem affecting agricultural productivity and the conservation of land-based resources.

12.11 Risking Internal Consolidation for External Support

Government contact with local residents has long been a source of differentiation in the social structural setup of rural households, particularly owing to differing property ownership in land. Together with this, new areas of intra-and inter-village social relations have emerged as governments approached local residents through their social, economic and political services. The social contacts thus created between local residents and the governments have further resulted in new forms of social relations among farmers themselves. The introduction of labor-intensive paid up public works to rehabilitate and conserve the environment in the context of relief resource distribution are among such new occurrences. From a social organizational perspective, the social contacts created through these features have had both

cohesive and divisive nature. Currently, there are three food-security related food and cash-based services. These are productive safety net program, the MERET project as part of the HABP and what is called Direct Support program. My survey showed that 86.25% of households in the three ethnographic villages had participated in productive safety net program for three consecutive years from 2007 through 2009. Just 7.63% of the total did not receive payment from this programme for the third year. According to the principles of this program, it means this much of households within these communities are short of supplying their food for entire year from their own produce and through purchase from the market. Generally speaking, out of these, 36.64% of households had received additional free food in Direct Support without having to provide their labor. Regarding the MERET project, 55.72% households had participated during the same period of time. Out of these, 49.61% of households had participated for the entire three years whereas the rest (the minority) had participated just for one or two years. On the whole, these and other related programs have had many positive impacts on farmers--relief, rehabilitative and developmental such as household asset creation. This has been well acknowledged by nearly all villagers/beneficiaries. All the same, so are their negative impacts.

The criteria through which beneficiaries are selected, the process by which payments are made, and in some cases, the way micro-watersheds or landscapes are used to delineate conservation and other project areas, as against the socioscape, could be seen in both positive and negative respects. Local residents are able to remain in their locale both during acute and chronic food insecurities, more to relief aid and paid up public works than to carry-over wealth or local coping mechanisms. This is a condition favorably contributing to social organization. However, because of survival need and wrong perception of relief aid, villagers would risk their social relationship competing for these resources. Many farmers regarded this as part of the

increasing privatization of life in order to cope up with the stringent survival requirements from increasing ecological and economic challenges.

From this, a tentative empirical generalization could be made: the more environmental problems become serious, the more private become their local responses and negative consequences. In this connection, the government and its international collaborators have been playing a role to fill the gap. Both success and failure stories abound. On a negative note, relief assistances have had negative effect on social determination for work as farmers themselves openly state it. Thus, local environmental perceptions are affected as a result of emergency and environmentalist projects accomplished by government, NGOs and the international donor community alike. Accordingly, time-honored institutions of self-reliance and kin-based interpersonal support during times of adversity have been decreasing in local social-institutional set-up over the last four decades. Not to be able to fill one's belly and that of one's family used to be regarded with shame and personal inferiority. The 1974-5 famine is believed to have set the change in motion when local residents for the first time came into contact with life-saving international relief aid provisions. As such, the social institution that protected communities from falling prey to conditions that let them down to self-insufficiency and unacceptable dependencies were stripped off leaving them in the open air. Successive micro-and macro-level droughts, food shortages and famines made the background more fertile for the thwarting of the old institutions. Relief resources paved the cultural condition in which more relief resources were to be needed; to the extent it was impossible to justify the need just by mere demographic and ecological reasons.

The new attitude to relief resources further enticed some community members to make mental investment on how to manipulate relief policies and regulations for personal gain. For many, excellence in this regard is seen as a social skill. Excess relief resources that many households were able to receive and even misappropriate during the 17-year *dergue* rule, created an ideal opportunity to exercise personal skills for relief resource abusers. Today, there are fewer

opportunities to manipulate relief resources. Nonetheless, social institutions have legitimated dependence on relief resource and the practice of appearing poor and helpless. Therefore, accesses to relief resources have continued being a standard sub-sector of the rural economy well supported by local institutions, governments' appeal for relief and the inflow of international relief resources, among others. Of course, the intentions of government policies and programs have always been to link relief with development. In actual terms, their unintended negative consequences have been significant (e.g. Hareide, 1990).

My research findings reveal that not only material things were being exported to Ethiopian farmers but also an understanding, attitude and expectation. On their part, not only did these farmers receive the lavish commodity but also the unfortunate, hapless risks hid in it. Therefore, when a farmer finds that the crop he has cultivated is going to be destroyed by lack of precipitation, he has already cast his mind on a forthcoming relief aid. The natural consequence of this is that he will have a less sense of predicament in the face of a rather uncanny environment going awry. Now the question is where do the boundary of this person's environment and his perception of it lie? If it does in his immediate environment, he has not already appropriately perceived it. By this I mean he has not felt as predicament as he should actually. If this boundary crosses to where the relief aid is coming from- it does not matter which aid-giving country-, it is hardly the case that he would ever figure out where these countries were. These countries are perhaps remembered when the food reaches his hand. One of the veritable impacts of these aid-giving countries is that local perceptions of environmental opportunities and constraints are affected by them. Therefore, theoretically, it might be difficult to define the environment simply within the immediate confines of this people. There is a feeling of 'we are the world', the motto employed by The Band Aid musical group which generated millions of dollars in the west to help victims of the 1984-85 famine.

12.12 Settlement Patterns as Ecological Response

Highlanders live in sparsely located homesteads whereas lowlanders live in huddled villages. My local exegetes in the highland said that their land needs manuring whereas that of the lowlanders does not due to the hot weather. Highlanders stressed that, unlike in the lowlands, in order to fertilize their land, it was mandatory that their homesteads are located closer to their fields.[243] This requirement has come increasing over the decades and might be felt even more if the problem of land degradation and shortage are not improved. This requirement was one of the reasons for them to stand against the villagization programme of the mid-1980s and pull back to their former places after the policy was lifted.

12.13 Conclusion

Overall, this chapter has demonstrated that socioeconomic and cultural responses to the human consequences of land degradation, land scarcity and drought have emerged from both internal and external factors. The more these problems increased in depth and breadth, the more farmers' responses have changed from social to private and from internal to external solutions. Traditional cultural and religious institutions have also come leaving the place to empirical reasoning even though still in many important respects spirituality matters in response to environmental problems, especially among the older generations.

The social organization of labor has changed over the years as part of local responses to these ecological problems. The significance of the different traditional sharecropping and livestock bonding arrangements, which used to take place not only among highlanders but also among highlanders and lowlanders, has been drastically decreased in the course of time. Less amount of *per capita* cultivable land and less *per capita* livestock adopted as part of

[243] It is also to reduce the risk of malaria infection that lowlanders establish their residence in raised areas.

local economic responses to cropland and pastureland shortage meant that the use of labor parities, sharecropping and livestock bonding are less viable, also becoming more private than social. Today, these forms of arrangements are sought as a way out just by some households. Otherwise, the majority has resorted to external credit to purchase say an ox rather than depend on these traditional arrangements. The belief systems that used to support these and other socioeconomic arrangements are changing from spiritual to secular rationalization rendering them less relevant. Increasing pressure on survival necessity, the growing privatization of rural life and the replacement and supplementation of local survival strategies by government and international relief efforts, in addition to ecological factors, are major causes behind these changes. In this regard, rural credit provided by government and international support organizations have rendered local moneylenders less desired and insignificant except during immediate shocks.

With the decrease in most of the traditional disaster or resource degradation coping mechanisms, off-farm activities and labor migration have been greatly employed over the last thirty years. Government policies are also encouraging off-farm income opportunities to an extent that has not been attempted before. In-country labor movement and migration to the Middle East Arab countries serve as important sources of new livelihood strategies, especially to young women and men. These young people bring positive differences in the lives of their families back home and in their environmental relations. Households with such opportunities are more empowered to withstand the effects of drought and other disasters, while they are also most likely better positioned to improve the productivity of their land. This is also contributing to the emergence of an economically better off rural class.

Internal labor movement and overseas labor migration; nearly universal enrolment in school as well as the exposure of the young to urban ways of life have affected the traditional family structure and parent-child relationship. As

a result, the social control of the older on the younger generation is becoming loose. Children are no more the source of labor to their families as they were in the past. In practice, there is a role reversal taking place as parents work as shepherds to replace their school-going children. Moreover, the youth who are landless and still go to school or are mere unemployed grade graduates have not only become what McCann has described as a *disinherited generation*. They have also become a *disengaged generation*, with little theoretical and practical grasp of TEK, skills and belief systems, which are indispensable to live as a farmer. Unlike in the past, labour movement and migration to the external world are supported by shifting traditional institutions. Nowadays, the male child is no more pressured to stay behind in his father's homeland as the security of his family and their properties. Today, both young men and women are encouraged to leave their homeland in the search for a better livelihood.

To deal with both acute and chronic food insecurity since the 1974, Ethiopian governments and the international community have invested huge resources on Ethiopia. The pros and cons of these forms of assistance are many (e.g. Hareide, 1990). While these resources have saved lives and created assets, the internal consolidation of relief recipients is risked by competition for external support. Moreover, and perhaps more importantly, their social determination of work and work ethics are affected by cyclic relief assistances failing to address the root causes of problems.

CHAPTER THIRTEEN: CONCLUSION

The dissertation concludes that small farmers' perceptual and cultural understandings and responses to their environmental constraints and opportunities are affected not only by local cultural and ecological factors but also by such extra-local factors as government policy, international relief aid and overseas migration. In this regard, it has shown the dynamics among smallholders, environment and the state, including global contacts made through the state and outside of official lines. Thus, a number of generalizations of theoretical and policy relevance have been made with the view to contribute to ecological anthropological theories and the application of knowledge for a better environmental resource use, rehabilitation and development. The detailed ethnographic descriptions presented demonstrate that smallholders' cultural understandings of the environment are replete with economic, social, religious and political meanings. Their symbolic and ecological significances are also quite diverse.

The perception of the social environment, which has the village as its hub, has been the traditional view in which the natural environment is also perceived. An organic relationship is perceived between smallholders as humans and their immediate environment and its resources. Ecologically, a dynamic interaction is perceived among the different components of the environment. Environmental degradation and development are understood to take place even without human contact. Largely, local understanding is that the environment and its resources have been changing continuously. There is a difference in understanding the environment and its resources between smallholders on the one hand and governments, scholars, policymakers and experts, on the other. Smallholders regard farming and all the natural resources necessary to support it as a way of live. The later regard agriculture and its resource-base as an industry (just trade or occupation). In the face of this distinction, the dissertation has brought up a number of areas in which the

two converge and diverge. As a result of many years of government, donors and NGO interventions, TEK, practices and believes are also partly changing, also incorporating western science and technology. The return impact of ecology, as resources went on scarce over time, has its own influence in the cultural and technical transformation of agriculture.

Along this processes of comprehending the environment, one of the major themes of this research has been that smallholders experience environmental opportunities and constraints, not only as empirical (that is material) but also as constructed difficulties. To establish this generalization, which is also about the impact of the ecology on smallholders' environmental behaviors, my research has explored local understandings of agricultural land and its resources namely soil, rainwater, trees, crops and livestock. The environment that provided abundant land to be cultivated also provided abundant soils, trees, rains, pasture and forage to support livestock. The 1973-4 Ethiopian famine is a historical watershed as people had generally fallen from a state of more than self-sufficiency, to famine and then, to successive states of chronic and acute food insecurity. Since then, ecological problems namely, population pressure, land shortage, deforestation, soil erosion and droughts have been part and parcel of the discourse of environmental problematization at local and national levels. Their negative human impacts have been very serious, the famines of the 1973-4 and the 1984-5 being the worst. In response to these empirical (physical or material) problems, a number of strategies have been employed such as traditional collective prayers, developing soil and water rehabilitation schemes, long-term dependence on humanitarian aid and out-migration. Tesfaye Tezera (2007), extracting information from FAO and USDA data (in Barrett and Maxwell, 2005), has shown how Ethiopia's share of world food aid ('in gross volume terms) has grown over the decades (p. 18). In the 1960 and 1970, the country was not in the ten-top world food aid recipient countries, during which India received the most food aid. In 1980, it became the last in the list of the 10 leading food aid recipient countries. After

a decade in 1990, its rank was deteriorated to third, preceded only by Egypt and Bangladesh. In the 2000, it assumed an even deteriorating position of second rank, surpassed only by North Korea. Ever since, the country has been increasingly dependent on foreign food aid and commercial food (Brüne, 1990). The government's resolution to render this dependency a thing of the past is yet to be left to the test of time.

The focus on immediate, huge, crisis management such as the recent major famines in Ethiopia disregards minor ecological stresses that weaken the capacities of many rural households to absorb major shocks. While such interventions as rainwater collection imply a move away from the old style, much more work needs to be done in this and other aspects of rural economic development. Small ecological stresses could be specific even to households in a micro-agro-ecology, such that household-based interventions in the distribution of resources and provision of advice and training become very helpful to deal with both ecological and economic problems.

The diminishing actual size of land possessed by households or *per capita* has been documented as concrete evidence that there have grown more human and livestock populations relative to the amount of available land resources. Soils and trees have also been depleted and rendered insufficient before different conservation schemes were made part and parcel of agricultural activities. Another set of findings to buttress this generalization has to do with how individual farmers are involved in direct perceptual engagement with the environment. There are differences in the ways individuals perceived how productive and useful a given plot of land is. Geomorphology, soil formation, water permeability and retention capacity bear significant micro-ecological variations which are accordingly perceived by farmers. Their responses to small, continuous stresses and to some extent, major crises, have also been affected differently. The dissertation has thus demonstrated that the knowledge of land as scarce and abundant, and that of soil as fertile and

infertile, and that of rain as adequate and inadequate, depends on direct experiential perception of the immediate environment. The abundance and scarcity of trees have been viewed in a similar manner within variegated micro-ecologies and generally shared cultural norms and practices.

On the other hand, the study has also documented a number of findings substantiating that the same environmental conditions understood as empirical problems are reconstructed culturally. Regarding the management of cropland, this change is largely reflected in the construction of agricultural space out of agricultural land and agricultural time out of agricultural season. The practice of soil conditioning, believed to have started long after the Gäddärro ancestors moved to this place, has been improving to the extent that all farming households apply manure/compost to improve soil fertility. Traditional soil and water conservation and fertilization methods that were a few in numbers before the 1970s have increased to more than a dozen today, including modern strategies introduced by governments and NGOs. The technique of diverting flood water soils into one's land is being practiced by many farmers. There are a few farmers who also carry soils from other places and put them on their weakened soils as a way of improving fertility. Accompanied by a growing perception of soil erosion and fertility depletion, the concept that used to hold soils just as natural resources is no more today. Indeed, farmers' perception of soil loss appeared to be more practical than those of scientific estimates. Based on the availability and robustness of soil and water conservation structures, there are instances in which different farmers hold different views of rainwater as scarce or ample, along with the differential effects of micro-ecology. Amidst the national discourse that drought is the major economic problem; it is ironically treated as an input to agricultural production. Herding is being replaced by the new concept of livestock keeping with a shifting trend of concern from how many livestock are kept to how effective they are managed against the valuation of their large numbers as a

status index. This interpretation strengthens what has been said by Croll and Parkin,

> Much as Foucault (1972a; 1972b) conceived of architecture as constructed space, plans and projects might be thought of as spaces constructed through associated power and knowledge. Here, development establishes a very particular relationship between person and environment and between human agents for a specific purpose and with a distinctive practice. …By this means the strategy, plan or project is marked out as a bounded space imbued with new meaning, language and intervention, so that human perceptions, beliefs and expectations of the environment may be endowed with *acquired significance* [emphasis added]. (p. 31)

The earlier ancestors of my field partners in Gäddärro did not have the need to plant trees. Their direct engagement with agricultural spaces, trees, soils and rain did not necessitate that this be so. This empirical condition fostered the culture of feeling well with the absence of tree planting and other environmentally developmental activities. Thus, for more than a century, they were largely just consumers of trees to the extent that most of the vegetation was cleared. In turn, this had degraded the capacity of the environment to support growing human and livestock populations. Their environmental history compares with that of the Dogon, for whom, land was in plenty until the second half of the 20th century, and as van Beek and Manga documented (1992), "The hard fact of diminishing resources has as yet not been culturally accepted, and probably will not be accepted quickly, as an exploration of the Dogon view of their natural habitat will show" (p. 67). In Gäddärro, after a serious de-vegetation was incurred, a culture of tree planting was started, as also envisioned by Beek and Manga in Dogon's management of their tree environment. This has happened also as a result of highland reclamation programs and subsequent individual projects and programs. Currently, the planting of trees is changing their perception of land shortage as well as poor land not conducive for crop production which can be much useful by growing trees on it. Demography has also played an important role in local notion of land shortage and the depletion of land-based resources. The population of

Awraççа which was composed of eight households in the second half of the 19th century had grown into about 100 households in 2009. That of K'és Gända, which after some decades, was composed of four households, had made to about 32 households. The same trajectory applies to the rest of the villages. This showed that land has become scarce, through division and re-division within and between generations. At national level, the same theory has been applied to explain out land shortage, environmental degradation, poverty and famine or food insecurity.

My research also underlines that the population-environment-agriculture nexus theory is changing. Following the technical progresses, which optimized available land, soil and other resources, local understanding of land shortage is changing. Therefore, there is a growing knowledge that a rural household could produce better on the same land that used to be called inadequate by means of applying land optimizing technologies. A cognitive shift in response to the new practices of improved land and land-based resources management is that a given land could be scarce and enough at the same time. In this regard, the same perceptual change at the national level is repeated locally regarding resource scarcity and abundance. The national rural development policy of the country has identified land, unskilled labor and ample water as the three major resources to achieve food security and economic growth. In the face of this, the study has found out that in both cases perception is far from being straightforward as it oscillates between scarcity and abundance based on the objective of the discourse. Therefore, based on such findings, the study calls for a new mindset to revise the population 'pressure' theory/model in which not only the amount of land owned per head is considered but also other economic opportunities that rural societies could employ to support themselves, meaning level of technology, including green revolution inputs, the potential for non-agricultural income, migration, remittances and potential future relocation. The future of the unborn citizens

of the country exists not only *a priori* (as it largely used to be in feudal Ethiopia) but also *a posteriori* to their birth.

The ongoing shifts between scarce and abundant land; drought and abundant water as well as overpopulation and ample unskilled labor, present two contradicting images of the village and Ethiopia at large. Therefore, interventions based on premises that regard these environmental problems as just problems of the bio-physical environment, which has been preponderant, are likely to be inadequate. They disregard the forces of TEK, modern technology, improved resource management and other resource optimizing measures, including the chance of migrating out in search of livelihood. TEK, imported technologies, relief aid and the international labor market, including internal labor movement, are thus improving the conception of resources and their management. In this regard, farmers need to be made aware that the role of government is just to introduce new technologies and innovations. Their expansion and promotion has to rest on farmers themselves. Local expectation for government to reach every farming household in the introduction and demonstration of new knowledge and practices has not been viable. Their perception of relief aid has also created a sense of dependency on external resources. This in turn is said to have affected their social determination for work in addition to creating internal competition for relief resources.

From the same points made so far in this concluding chapter, it is possible to generalize that today's environmental solutions could be tomorrow's problems. In the past, knowledge of resources as free gifts of nature had encouraged their degradation. Later, cultural notions of the same resources as scarce are improving their conservation and development. Converting forest and bush lands into croplands had been an effective response strategy to land shortage for a long period. However, after many decades of its expansion, it rather became a serious environmental problem requiring further corrective responses. In fact, it became quite non-viable. This and many other

experiences in this dissertation are vivid illustrations of one of the challenges of sustainable resource use. They starkly stand out to teach us that at least some aspects of the degradation that might arise from present failures in land management practices might not become evident in our time, or even in the time of generations of the near future. While slow processes should yield abundant time for adaptation, and undoubtedly have done so in many parts of the world, their very slowness carries with them some dangers if the damage is not perceived early or before the environment is destroyed irreparably (Blaikie and Brookfield, 1987, p. 67). In light of this, Ethiopia has been a victim of these dangers. Contrasting Ethiopia with northern Thailand, Hurni has said:

> Ethiopia is less sensitive to erosion than northern Thailand, but is also now less resilient, so that long and slow erosion works a more deadly effect….we need to note that while the causation of current erosion in northern Thailand can be sought in the practices of the current generation, the causation of the Ethiopian problem needs to be sought in the cumulative agricultural practices over a period of centuries. (Hurni, 1992, as cited in Blaikie and Brookfield, 1987: 67)

Owing to this time lag and its cumulative effects, land management in Ethiopia has been largely restorative rather than conservative. Therefore, the issue of sustainable use of resources in Ethiopia and similar countries should be differently viewed from those like northern Thailand. In the Ethiopian case, the current generation is not only responsible to repair what it has been degrading but also what the long generations of the past had. Accordingly, the future generations might not be simply receivers of a protected environment from which they could easily reap their modest wherewithal without the need to be worried about correcting carryover mistakes from past generations. This is one of the issues that make sustainable use of resources so complex both conceptually and practically.

Therefore, my dissertation concludes that it is difficult to be certain of environmentally sustainable practices. In this regard, it has argued that culture can be the cause and at the same time the solution to environmental problems.

It means that culture can be a medium to understand the environment better and to misread it as well. The ultimate effect, combined with other factors, is that, however knowledgeable or "detached" they could be from nature or become "above" it, as Babe wrote of the Darwinian model (Babe, 2006, p. 43), the findings of this dissertation show that humans are never omniscient of their operational environments. The constraints and affordances of culture in relation to the environment are well expressed in the following quotes:

> Culture is that which enables people to survive in a particular environment, to express themselves in relation to it- although there is no guarantee that they will operate in harmony *with* it. Indeed, the environment and our changing conceptions of it, at both macro and micro levels, forms the ideal ground for the interrogation of that notoriously vexed word 'culture' itself. (Flint and Morphy, 2000, p. 1)

This could also serve as a testimony that the theory based just on conscious, programmed actions to achieve sustainable use of resources and redress problems such as global warming is not adequate for an ecologically friendly management of natural resources. In other words, this means that neither TEK nor WSK, though essential, are sufficient to enable full diagnosis and grasp of environmental problems and their solutions. For that reason, sustainability shall continue to be a challenging link between the past, the present and a less certain future. To deal with this inherent problem, one feasible strategy is to doubt consciousness or cognition and certainty in our day-to-day and in all environmentalist interventions as adaptive management of the environment. To this effect, western (ecological) science and TEK could supplement each other. Even when environmental problems are known, different factors could detract human beings from taking the right paths towards environmental solutions. My study supports the idea that the "disjunction between theory and practice" that existed in "all philosophies and religions" causes "disillusionment, skepticism, and cynicism" (Tucker and Grim, 2001, p. xx).

The question, why the studied communities and Ethiopian farmers at large have degraded their land resources, has to do with politics as well. The dissertation has demonstrated a general trend for an increased state control of

land and its management practices in the history of this country. As in the feudal period, in the regimes that followed, land has been put under government ownership. Except individual plots and other private allotments, other lands out of direct agricultural production have officially been inaccessible to farming communities. The change evinced in this regard is expected to have worked much in deteriorating what rudimentary care and concern the public could have of those vegetated lands. The destruction of forests for private benefit by the general public during times of power vacuum, or when an impending change is expected, has been another facet in which systems of governance are related to land resource destruction. Land degradation and its responses in Ethiopia are better understood against such structural relations of every government to land resources and the people which worked these resources.

State control of land has been a discouraging factor in land conservation in this country. Historical findings in this dissertation reveal a general trend for an increased state control of land and its management practices. All the same, the most important tenure related constraint regarding land and land-based resources is found to be more structural than it has been assumed by earlier writers. On the whole, local environmental friendly responses have been affected by the same factors that have encouraged resource degradation over the century. Socially, the organization of agricultural labour has been rendered more private than social. Landless young men and women migrate out in search of job opportunities, thus affecting the traditional family structure, parent-child relationship and the male child's attachment to the paternal home village. Technically, plowing, cropping and livestock practices have undergone changes, many soil and water conservation structures have been put to use, also as part of governments' and the international community's response to land degradation, drought and food insecurity. A number of production enhancing technologies such as improved seeds have also been made available to farmers although their supply has been far from being

sufficient and timely. In the same context, international relief aid has been supplied since the 1973-4 famine as free hand out and payment made in return for such works done as terracing and tree planting.

State ownership of land, spontaneous eviction and some other measures, have long been mentioned as reasons why farmers degrade or fail to conserve their land and its resources (Alemneh, 1990; Dessalegn, 1994; Koehn, 1977). Notwithstanding the need for improved tenure security, this dissertation has shown that the issue is more complex than it appears. For instance, farmers have been increasingly planting trees to the present, once tree planting culture was introduced. Therefore, there is a degree to which tenure insecurity could be a bottleneck in this regard. Land shortage, low survival rate of seedlings and availability of natural woodlands have been considered as additional factors reducing tree planting behavior among farmers in Wello (Alemneh, 1990). Further to this, in practice, my study has revealed that trees and crops do not go together spatially. Trees harbor pests and beasts that attack field crops in addition to affecting normal growth by their canopies and roots. This cognitive schema is based on direct experience of farmers and might continue in defiance to government-initiated agro-forestry as a new strategy of promoting multiple uses from a given unit of agricultural land. Research experiments involving farmers might produce a better way of perceiving tree-crop relation and their integration (Schrempp, 1992; Cook, 1992).

The most important tenure related constraint regarding land and land-based resources in Ethiopia today, as far as I could infer from this ethnographic study, is more structural than it has been assumed by earlier writers. As a result, it has become a problem most likely not solvable by issuing just new policies or changing existing ones to institute private ownership in place of state ownership of land. Most likely, it is deeper and structural than that having to do with traditional use of resources and popular lack of trust in governance because of the long tradition of undemocratic and chaotic power

transfer at least over the last century. Therefore, lurking in the hearts and minds of farmers, it appeared there is a strong suspicion that any incumbent government could be toppled and replaced by another, which would all the more, begin everything from scratch rather than build on the past. Notwithstanding policy changes, it requires creating and establishing in citizens' minds a culture of democratic and stable power transition in the country.

Even in a fully privatized scenario, land management practices also depend on existing environmental knowledge, life objectives, valuation of resources, and other normative aspects of the human-environmental relationship. Soil conservation and fertilization were new innovations in this research area. Planting trees was never practiced as far as nature did this on behalf of these farmers. Water is still largely held as a free gift in agricultural production even though the management of small moisture stresses is well integrated into the farming system. The management of livestock has always been poor even though the country has been the first in continental Africa, and the 10^{th} in the world, in livestock population. This was so not because farmers did not own their animals privately and were not allowed to dispose them as desired. It was so because the cultural understanding of livestock, their meaning in the social relationship of rural life and social exchanges were not contributory to an efficient and environmentally friendly livestock management practices. Accordingly, the culture has aggravated the negative ecological impact of livestock. Of course, without much change in the tenure system, the land management practices of the research communities over the last three decades have improved despite some problems continuing. This has to do more with change in the mind than in land policy and its administration. Maintaining the status quo of the current policy would become environmentally friendly only as far as state ownership of land is not used as a political instrument by government. Undoubtedly, state and the international community of donors have an important impact in this regard. This dissertation, does not deny that

land tenure policies in Ethiopia have been discouraging economically viable and ecologically sustainable management practices on the part of smallholders. Indeed, it has rather documented that different ideologies and policies have negatively affected the economic, social and political gains the broad masses of Ethiopian farmers could have achieved in the face of the increasingly globalized world context. My argument is that it has been simplified and over-emphasised to the disregard of other important factors.

The dissertation has demonstrated that many old farming knowledge and techniques that were put into use are no more among the living generations of Gäddärro. New ones have also been introduced by farmers themselves and many more by government and the international development community since the 1970s. In this regard, the study has found out that technologies and innovations that come through states and NGOs are better adopted by smallholders in a fairly short period of time if they have some nearness to already existing local knowledge and practices. This is specifically demonstrated by the application of the recently introduced composting technology to improve soil fertility. As also documented by Yilkal (2008, p. 88) in East Gojjam, this shows how some traditional ecological knowledge and practices (e.g. traditional manuring demanding more labor and time) needs to be improved or complemented by modern resource management knowledge and techniques. On the other hand, the application of inorganic fertilizers and planting in rows, have not been accepted to any meaningful measure despite their introduction years ago. The collection of rainwater in chambers dug in the ground had been frowned upon in the beginning and not much progress has been achieved so far though there has been gradual improvement. According to this dissertation, the cultural nearness of a new practice and the ideology behind it are important factors for the successful adoption of new knowledge and technology. In this regard, it is very essential to underline that culture is just one of the factors along with others such as land size owned, household economic standing and ecology.

While it cannot be denied that the local appropriateness of TEK could be both its strength and weakness since "locally developed knowledge is often difficult to translate beyond the immediate context (Menzies and Buttler, 2006, p. 2), it should not be forgotten that many TEK and thoughts carry across regions and have globally scientific validity. Accusations filed against contemporary forestry practices that attention is given to timber production as against "non-timber forest resources, watersheds, and aquatic species" (Menzies and Buttler, 2006), could equally be leveled against local and state practices in the over-emphasis on eucalyptus planting in Wärräbabbo and the rest of Ethiopia. The dissertation in this regard concludes that the rule should be not TEK or WSK; rather it should be TEK and WSK.

This, however, should not mean that new knowledge and practices alien to tradition need not be transferred to farmers. It only stresses that much effort needs to be made in order to streamline them with preexisting cultural understanding and practices of smallholders. This rigorous effort has partly to depend on the understanding that the majority of smallholders need prolonged time to test and analyze new technologies and thoughts before they are adapted to a large extent and rendered part and parcel of local repertoire of knowledge and practices. On the other hand, developers who work in a tight time frame of acting now and seeing results shortly are less appreciative and tolerant of this need which should include small-scale start of new technologies and their social experimentation. Accordingly, inasmuch as the land is made to speed up and cut the length of its production time through the application of early maturing varieties and other technologies, so are farmers hastened into shrinking the time they would require to experiment and internalize the benefit of new thoughts and practices. The negative consequences of this rush have been the low uptake or rejection of a number of modern technologies and innovations, including those which could have been helpful. This, nonetheless, should not give the impression that farmers work without the need to rush as governments do. Time as a resource has been

as scarce for farmers as it has been for governments. As a result of this and other factors, farmers' attentions are pinned just on the here and now, their survival in other words. The difference is that the same concern has caused the two actors to pursue different courses of action. The precedence given to achieve survival has also rendered many farming households less ready to accept risks but the overall condition seems to be a state which is broadcasting some seeds of sustainability within survival use of resources.

To deal with this challenge, as much as possible, priority has to be given for new interventions with some notional and pragmatic affinities with traditional knowledge and practices. Secondly, it should not be forgotten that WSK, expertise advice, the market and the like are suspect for the majority of smallholders. Therefore, their risk aversion behavior inhibits them from investing much on a strategy whose result has not been tested before. As a result of this, interventions involving small efforts and capital outlays are more likely to be adopted than those with heavy expenditures. Thirdly, all new technologies and thoughts need to be piloted and then scaled-up accordingly before full or total implementation such as the experience of rainwater harvesting which was started during the first years of the 2000s. Finally, experts also need to know that inasmuch as their science belittles local knowledge, so does TEK in relation to the former. The integration of TEK and WSK among the research communities is not just the confrontation, interaction and integration of epistemologies of two worlds. It is also the exercise of authority and power between government and smallholders. Policy wise and programmatically, these complexities and subtleties need to be well understood. In their power relationship with government and experts, smallholders might adopt a strategy of pretense and appear to be implementing their recommendations while they might not be actually.

Policy wise, there is more to be drawn from this study. The district of Wärräbabbo is largely moisture-stressed so that the uses of chemical fertilizers

need to be specially targeted at households with access to moisture conserving lands. During times rain is enough more number of households are chanced to use fertilizers of any kind. In this regard, the preparation and application of modern composts need to be strengthened in line with the scientific recommendation. The traditional method of commercial fertilizers application also needs to be micro-agro-ecology, if not plot specific, to achieve the best benefits out of their use in places they could be applied. Modern seeds are in short supply despite farmers' enthusiastic acceptance of these resources. Pesticides are also in high demand since most of the traditional methods against pests are less effective. While introducing integrated pest management systems could be more economical and ecological, the delivery of modern pesticides needs to be increased to meet this demand. While resources might always be a constraining factor, intensification of crop and livestock production in these areas require that these needs are met to a meaningful degree.

Horticultural crops such as *khat* and orange are land-saving crops in the face of growing land shortage. Vegetables could supply the household food basket in addition to fetching money if transportation and packaging are to be improved. Government intervention in livestock production development through credit has enabled several rural households to intensify livestock keeping such that finding a draught ox is not an issue as important as in the past for rural households. Since livestock production is hampered to some extent by inadequacy of improved breeds, the scheme needs to be intensified in order to render this sub-sector a strong support to the rural economy in addition to cereal production. Off-farm income generation activities with the help of government credit services have enabled some young people to establish micro-businesses such as shop-keeping. While this is a potential opportunity to engage, especially the unemployed and under-employed mass of young people in rural areas, follow up and supervision needs to be strengthened to train and discipline young people into a reliable tradition of

entrepreneurship and work ethos. Some young people, who do so, on their own, also need further institutional support from government and NGO.

Based on the findings of this research, the perception-behavior nexus in environmental resource management seems to be subjective and more complex. There are two possible scenarios in which behaviors could be analyzed in relation to institutions that actually or purportedly support them. Firstly, expecting an immediate link between perception and behavior implicitly treats perception as something static rather than processual and changing. Actually, due to the invisible, intangible and subtle nature of perception, it might not be quick and direct to observe that a given perception is undergoing a change. On the other hand, it is generally visible, concrete and vivid to see that a given behavior is taking place or changing. As a result of this, observers might be enticed to conceive that behaviors are changing irrespective of corresponding alterations in their institutions. The second probable scenario is one in which perception is considered just as one of the important factors that would inform behavior. In this case, their correlation is not necessarily immediate, direct and causative, depending on the combined effects of different factors (social, economic, political and ecological) that render perception to count or not to as a factor predisposing corresponding behaviors. In this case, for the perception-behavior correlation to be applied as a grand theory, its application needs to be seen against the weight of these factors. Otherwise, the application of the theory will be simplistic and confrontational to the very existence of the theory itself. Therefore, in this dissertation, perception (knowledge) has been considered as a flexible blue print for human behavior. The research communities regard their institutions as the overall, flexile guide to their behaviors in their social, economic, political and religious organizations. Writing of the environmental philosophy of the Chisasibi Cree people of James Bay, Berkes said:

> Stated simply, the ability to use resources in a sustainable manner cannot be accomplished merely by the possession of appropriate ecological knowledge and

> social institutions. There also has to be an environmental ethic to keep exploitative abilities in check and to provide "ground rules" by which relations between humans and nature may be regulated. (1988, p. 8)

In this dissertation, in spite of their evidenced and potential scientific applications, the utilities of traditional ecological knowledge, including religion, in environmental management are rethought and rechecked along this line. It has documented empirical evidences that local knowledge and objectives in satisfying smallholders' needs based on their natural environmental resources need to be regulated by a higher level political organization. Therefore, despite some negative commentaries, the regulating hand of the state is regarded (be smallholders) mandatory for peaceful, if not always ecological, use of natural resources. Their position go well in line with that of Scruton: "We need free enterprise, but we also need the rule of the law that limits it" (1993, p. 8).

Concerning agriculture and human-environment interaction, there seems to be two likely future scenarios for the communities I studied. In the first case, after redeveloping the land to a certain point, they might fall back to degrading it such that the threshold is reached once more. The second likelihood is that improved (and unexpected) social, economic, institutional and ecological circumstances might encourage them to continue developing the land to the long term. Leaving these possibilities for time to answer, at least for the moment, we could certainly say that the Gäddärro communities and many others in the highlands of Ethiopia have already reached the 'ecological' threshold where they could no more continue degrading their land. To be successful in agriculture, the parts to be played by smallhoders and the state have increased over the years whereas that to be played by nature has decreased. This has been documented as a new environmental knowledge or philosophy well grasped as a desideratum of living on the land. For the policymakers and the developers, the period is an accidental historical opportunity to aggressively tackle the problems of land and environmental

degradation in the severely affected highlands of Wello and other parts of the country.

The implicit assumption that, if by some miracle there were going to be all the ambient climatic conditions of the long past, the country would be food secure does not carry full weight. From local evidence in this research, areas that are already highly populated do not seem to live up to this expectation, especially regarding households with very minimal land holding. For many rural households living on meager amount of land no ideal production optimization resources might free them from poverty, food insecurity and hunger despite possible increase in production per a unit of land and reliving the pressure on the land. For that to happen, education, family planning, population control and off-farm income opportunities need to be further promoted. Therefore, along with the intensification of these interventions, the relocation of such households into better resourced areas with ample and fertile land seems to be an incontestable alternative. Cultural and social dislocation associated with displacement and the phobias from the ill-planned negative effects of the massive resentments of the 1980s still linger. In this regard, it has to be known that the translocation of human beings is also the translocation of minds, including environmentally unfriendly land husbandry and farming techniques. Currently, the politics of ethnic federalism has removed the possibility of trans-regional relocation in Ethiopia. While this needs to be an issue for reconsideration, there still is a room for effective and efficient land settlement programs within specific regions.

I have employed a number of theories to understand and explain the different research questions pursued in this study. This composite theoretical orientation is also based on the changes and complexities that humanity has undergone and the academic demands of a globalizing world (Bennett, 2005; Bauman, 1998). Complexity, connectivity/interaction, time or history, process and causation, multi-scalar orientation, multi-directionality, power relation,

global political economy, meaning/communication, natural resource management, degradation, conservation, TEK, WSK as well as micro-environmental variations have been considered as important conceptual tools of this emerging theoretical orientation. The different theoretical approaches of ecological anthropology that straddle from the late 19th across the 21st centuries have differences and remarkable similarities. The shift to a non-deterministic, processual and interactive ecological framework is best understood as an integration of the past and the present. Its major premises could be framed as: (1) culture is necessary but not sufficient explanation to cultural forms and sociocultural changes; (2) nature or the natural environment is necessary but not sufficient explanation to cultural forms and sociocultural changes (3) both culture and nature are essential to explain cultural forms and sociocultural change; (4) consciousness is essential but not sufficient to treat the environment; (5) the human-to-human relationship (power and authority) affects the human-environment relationship, and (6) understanding the present is critical but not complete without re-scrutinizing the past and envisaging the future. These premises are the base of the processual and interactive theory that has been also considered as the third stage of ecological anthropology. Therefore, a comprehensive understanding of an ecological problem in this research was achieved based on these premises.

The theory that treats environmental perceptions as empirical, pragmatic and institutional can be brought to better understand how practice fail to tally with TEK and beliefs in the study of human-environment relation. The institutional perception is the behaviour-ruling attitude implemented most likely under situation of heavy government control of resource use and in conditions where the respect of the rule does not culturally contradict with the subsistence or survival need of the individual. Among societies where there is greater or unlimited freedom to execute pragmatic perception, the level of environmental degradation generally might tend to be higher. This type of environmental

perception is expected to be predominant in politically liberal societies. Among societies where there is greater re-enforcement for the implementation of the institutional perception of the environment, the level of environmental degradation is generally expected to be lower. This generally corresponds with conservative societies.[244] Among societies in which the empirical perception is scientifically sound, there is lesser demand on regular or environmental interventions to render institutional perception the behaviour-ruling attitude in natural resource management. The challenge of creating environmentalist and nature-friendly human-environment relations is one of transforming empirical perception to institutional perception. Empirical perception is both ecologically and economically neutral, in essence. Pragmatic perception is anthropocentric and attaches more value to survival or economy rather than ecology. On the other hand, institutional perception is ecocentric unless marred by unregulated free market economy and individual freedom.[245] It is the norm theoretically accepted by all stakeholders alike in environmentally conscious societies: communities, activist groups, states, NGOs and scientists.

What is more, all the theoretical perspectives reviewed have to do with conscious and unconscious action/thought in ecological relationship and changes thereof. The different ecological theoretical perspectives reviewed in

[244] Roger Scruton (1993) argues that political conservatism goes in line with environmentalism. Its 'maintenance of the social ecology', its opinion of political action as 'trusteeship rather than enterprise', 'conservation rather than command' and its consideration for social capital, customs and institutions and its non-support for free market economy makes conservatism 'a natural bedfellow' of environmentalism. (1993, pp. 7-9) For conservatives the focus on individual freedom should not allow the destruction or improper use of the environment. However, Scruton does not believe that abolition of free market economies could guarantee an environmental solution, as state enterprises would replace them to affect the environment unanswerably. Socialism could be a case here. To this effect, he said, "We need free enterprise, but we also need the rule of the law that limits it". (Scruton, 1993, p. 8) For him conservatism has elements of concern for successors and sustainability.

[245] On the contrary, liberalism is associated with a negative view of nature for its "assumption of human superiority over everything else" (Wissenburg, 1993, p. 20). Feminists have linked humans' exploitation of nature to that of the subordination of women by men (Plumwood, 1993). In general, the world has arrived at a stage where environmentalism has to be evaluated against democracy, human rights and freedom. The satisfaction of uncontrolled human need versus these principles is a question that has not been solved yet.

this dissertation are those which support or negate the importance of the conscious in addition to the unconscious. The findings of this dissertation strongly support the contention that conscious and programmed applications of natural environmental resources have been short of guaranteeing sustainable use of resources among the communities I studied. Rather, in defiance to their many ecologically friendly religious beliefs, the environment has been drastically degraded at least over the last century though some improvements have also been made. In response to Marvin Harris's cultural materialism, which rendered culture as adaptation to the environment, Milton, wrote, "The main objection to this approach was that it tended to assume the possibility that some might be maladaptive" (1996, pp. 46-7). As to be also supported by the findings of this dissertation, Milton has strengthened her point as saying, "It has been argued many times that this assumption is untenable, that cultures do not necessarily hold their populations in balance with their environments and many even endanger their own survival" (1996, pp. 46-7). Tucker and Grim's *healthy skepticism*, *cautious optimism*, and *modest ambitions* (2001) could be taken as valuable principles of making use of unconscious thoughts and behaviors in natural resource management. There are many instances in the findings of this research justifying the benefit of such a composite theoretical approach. For instance, traditionally soil was regarded as an agricultural resource existing profusely and given freely.

The valuation of resources has been theorized as something contingent on a number of factors. A thing regarded once as useless or even problematic can have high utility at another point in time and space because of cultural, technological and ecological reasons. This supports the theory which argues in favor of relying on unconscious resource use aspects in addition to conscious, programmed activities. Resource degradation is also treated as a cultural and bio-physical problem and the specific relation of individuals or communities to an environment at large or to specific environmental components. In this regard, both natural forces and human intervention are considered as causes of

land degradation though some scholars maintain the view that humans do not necessarily degrade the environment. The dissertation concludes that the environmental resource understandings and responses of smallholders among the research communities and most likely that of highland Ethiopian communities, have been transforming from ecocentric to anthropocentric; from social to privatized thoughts and decisions within the generally shared and understood agro-ecologies they live in. What is more, their responses to environmental stresses and risks have come along the same line of shift both in relation to small continuous stress and large disasters occurring at different times. The dissertation also underscores that regarding both of these shifts, the stake of external factors (both national and international) have come increasing, especially over the last four decades. The same trend is likely to continue into the future.

As already mentioned, the research has documented that no knowledge is indubitably certain. The environmental quest as symbolized and spearheaded by some of the commonest phrases of our age such as "sustainability", "sustainable resource use" or "sustainable development" could be challenged. Human behaviors and their organizations are both part of the cause and solution to the environmental problematic. Hence, also based on such writers as Milton as well as Tucker and Grim, the study recommends the culture of systematic doubt, which is continuous, systematic inspection of the conscious, and the planned. It also underlines the need to imagine the unexpected not only as a response to the need to be more sustainable but also as a fundamental, inherent philosophy of human-environment relation since nobody is perfectly sure what the future holds. The only option seems to be adopting sustainability with all its challenges as an international ecological religion spanning the local through the global. The entire course of this dissertation could be regarded as part of the human experience that led to the current social and ecological problems and the struggle to get out of them or to leave with them positively and imaginatively. Today, western cultural

features in agriculture, natural resource management and other activities of economic necessity, constantly push the adult communities of Gäddärro away from their past. Secondly, most of the younger generation from within, influenced by modern education and the attractions of town life, is disregarding old customs and practices, including those the older generation still struggles to save. Accordingly, having its relations both from within and from without, the older generation is constantly challenged by socio-environmental problems whose mitigation, if not solution, still requires it to do away with at least some of its traditions and grasp at least some of the opportunities coming from the external world. On the ground, the living older generation has been trying to achieve its best, so to speak to survive, by synthesizing the past and the present or the traditional and the modern into the future. Nonetheless, their concern of the future is more about their children and their future generations who should adopt a different life style to that lived by their parents and themselves. Therefore, a new vista of urban style of life, both in country and out of the country, is envisaged. This environmental outlook and their desperate struggle to revamp their environment and survive, as they still swing between the two edges of the *abïll asïll* or *hid tagär-nur tagär* (live in the homeland and leave the homeland) continuum, renders them sustainable at least at heart as against their ancestors, who over tasking the land, are sometimes recalled as saying "let the future children grow their food on the manure of their waste". The Gäddärro experiences show that the need to focus on the past is more than academic requirement of a scientific exercise or some need for academic sophistication. It is and must be regarded as a necessity of practice because as tomorrow is not a complete mystery neither is yesterday a mere history. The past and the future converge in the present such that today cannot be best understood and lived without looking back at yesterday and previewing tomorrow. Both the constraining and affording environmental history and contemporary knowledge and practices of the

smallholders of Gäddärro have as much lessons to offer to the rest of the world as they have to learn from others.

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APPENDICES

Appendix 1: A social organizational chart of the ethnographic and the neighbouring villages *

	Organizational Factors (Issues shared among villages)	Villages												
		AW	AB	WR	BT	WB	BN	BQ	HQ	SB	K'G	SG	KM	K'D
1	Sharing a mosque													
2	Exchange of *k'iré* grain crops, *ïngära*, fire wood, water fetching services, coffee making and related service provision to mourners at death, including money contribution at death													
3	Collective *wädağa*, sharing *du'a* and *sädäk'a* services													
4	Attending wedding													
5	*Ğigi* and *wänfäl* labor													
6	Economic exchange (land, livestock, forage, etc.)													
7	Sharing farm boundaries													
8	Inter-marriage													
9	Blood kinship													
10	Water point													
11	Village routes													
12	Paid public works													
13	Day labor													
14	*Gosa*													
15	Public meetings													
16	Training and workshops													
17	Conflict arbitration													
18	Generally share all good and bad fortunes (*ïrzïk* and *bäl'a*)													

	Organizational Factors (Issues shared among villages)	Villages												
		AW	AB	WR	BT	WB	BN	BQ	HQ	SB	K'G	SG	KM	K'D
19	Flour mills													
20	Schools													
21	Health post													
22	Fixing woods and stones for burial (*alhad* pit)													
23	Splitting logs on funeral/mourning services													
24	Processing grains and making *ïngära* on mourning													
25	Digging burial pits													
26	FA membership													

AW= Awraççа; AB= Absaro; WR=Wärrä Ruga; BT=Bultum; WB= Wärabäiti; BN= Binné; BQ= Bäk'alo; HQ= Hulluk'o; SB= Säybäro; K'G= K'és Gända; SG= Šolla Gända; KM= Kibi Méda; K'D= K'ädida

*The significance of shading in this table is that the organizational factors are shared among villages.

Appendix 2: The household survey questionnaire (Quantitative)

HH Identification No…….

1. Date of Interview……

3. Starting Time ……..

4. Completion Time …….

Part One: Household Bio and Demographic Characteristics

1. Name of village?.....

S. no.	2. Names of household members starting with the HH head?	3. Sex? Male……1 Female….2	4. Age (year complete d)?	5. Relation with HH head? HH head…….1 Wife/Husband…….2 Own child……3 Grandchild……..4 Nephew/niece……..5 Mother/father……..6 Sister/brother…… 7 Other relatives…….8 Other non-relatives……..9	6. Marital status of HH head? Married……..1 Coexisting……..2 Divorced……3 Separated……4 Widow/widower….5 Never married…....6
1				1	
2					
….					
…..					

no.	7. Educational status / grade completed? Non-literate / numerate……1 Literate & numerate…….2 1st grade……1 2nd grade……2 3rd grade……3 4th grade……4 5th-8th grade……..5 9th or 10th grade……6 Preparatory……7 Vocational…….8 Univ./college dip…….....9 Univ./college degree……10 Underage……..11 Never gone school……12 Don't know…..……13	8. Is (name) currently attending school? Yes …..1 No…….2
1		
2		
….		
….		

Part Two: Sources of Livelihood

9. What is the primary income source of the household? 1. Crop production 2. Animal husbandry 3. 1 & 2 4. Sale of semi-skilled labor 5. Sale of unskilled labor (day labor) 6. Other, specify……..

10. Is there a member of the household who migrated to other places in search of day labor during the last three years? 1. Yes 2. No

11. If yes, how many persons from the household did migrate in search of day labor?

S.n.	Sex	R/ship to HH head	No.
1	Male		
2	Female		

12. Is there any member of this household who had migrated out of country in search of livelihood?

1. Yes 2. No

13. If yes, how many persons?

S.n.	Sex	R/ship to HH head	No.	Year of migration (for first migrant)
1	Male			
2	Female			

14. Which of the following achievements did the migrant accomplish back home?

Achievement	Yes	No
Sent remittances		
Built house for parents/relatives		
Built house for self		
Opened some business for self/parents/relatives		
Holds account at local bank		

Other, specify……..

Part Three: Landholding: Current and Historical

15. Does this household own land currently under its name? 1. Yes 2. .No (Skip to q. no 23)

16. If yes, provide the following particulars?

Land holding / use type	Quantity in ropes	Village location	Fertility rank*
Crop land			
Grazing land			
Perennial crop land			
Tree / forest/ bush land			
Fallow land			
Homestead land			

* 1. First class 2. Second class 3. Third class

17. Did you get land as an *abbat / enat adder* during the 1984 land redistribution?

1. Yes 2. No (Skip to q. no…)

18. If yes, how many units (ropes) of land were you given in the 1984land redistribution?
…….

19. Did you get land in the June hill land /*daget meret/* redistribution carried out after the main redistribution in the year? 1. Yes 2. No

20. If yes, how many units (ropes) of land were you given in the 1984 June hill land redistribution?
……

21. Have this household ever received additional land since then? 1. Yes 2. No

22. If yes, how many units (ropes) of land were you given in addition?.....

23. Have you sharecropped in or rented out any land in the past three production years? 1. Yes 2. No (Skip to q. no 30)

24. Have you sharecropped out or rented any land in the past three production years? 1. Yes 2. No (Skip to q. no 30)

25. Have you ever cultivated mofer zemmat (distance cultivation)? 1. Yes 2. No

26. If yes,
Why?.....

(For those who started farming as household heads after the E.H.S regime)

Part Four: Crop production

27. Did you farm during the 2008 production year? 1. Yes 2. No (Skip to q. no 46)

28. If yes, what was the use pattern of the land under your holding in the production year 2008?

Crop name	*Bilagi* cropping			Part of produce marketed		Kiremit cropping			Part of produce marketed	
	Land covered (in ropes)	Variety planted	Total harvest	1. Yes	2. No	Land covered (in ropes)	Variety planted	Total harvest	1. Yes	2. No
Zengada										
Maize										
Sorghum										
Wheat										
Teff										
Barely										
Oaths										
Millets										
Horse beans										
Pease										
Lintels										
Haricot beans										
Linseed										
Niger seed										
Sesame										

29. Do you grow perennial crops? 1. Yes 2. No

30. If yes, answer the following questions?

Tree Name	No. of trees	Productive 1. Yes 2. No	Sale from 2008 (If none put "0")
Coffee			
Khat			
Hope			
Orange			
Sugar cane			
Guava			
Banana			
Tangerine			
Mango			
Apple			
Lemon			
Casmir			

31. Are there any problem/s you are currently facing in order to improve crop production? 1. Yes 2. No

32. If yes, which of the following constraints you are currently facing to improve crop production and productivity?

	P & D	SFD	SL	D/SR	LO	SIS	LS/ K	Water logging / excess rain	Shortage of chemical fertilizer	Lack of labor	Lack of capital	Shortage of drags	Short age of credit
Yes													
No													

P&D=Pests & diseases; SFD=Soil fertility decline; SL=Shortage of land; D/SR=Drought/shortage of rain; LO= Lack of oxen; SIS=Shortage of improved seeds; LS/L=Lack of skill / knolwedge

Others, specify…….……

33. List the three most important problems from among those identified above?

1…… 2……..…….
3…….

34. What measures should be taken to mitigate or tackle these problems?.....……...

Part Five: Livestock Production

35. Do you keep animals currently? 1. Yes 2. No (Skip to q. no 51)

36. If yes, answer the following questions?

Type of animal	Species 1. Local 2. Hybrid 3. Both	Number owned now	Sale from 2001 (Birr)
Ox			
Cow			
Bull			
Heifer			
Calf			
Sheep			
Goat			
Donkey			
Mule			
Horse			
Camel			

37. During the past three years have you reared somebody else's animals in any form of livestock bandage? 1. Yes 2. No (Skip to q. no 53)

38. During the past three years have you given any animal to others for rearing in any form of livestock bandage? 1. Yes 2. No (Skip to q. no 53)

39. Do you currently face problems to improve your livestock production and productivity?

1. Yes 2. No

40. List three most important problems from among those mentioned above?

1……..2……3……

41. Did you buy livestock forage in 2001? 1. Yes 2. No

42. If yes how much birr did you expend on livestock forage?.....

43. Did you sale livestock forage in 2001? 1. Yes 2. No

44. If, yes state the income from sale of livestock forage in Birr? …….

Part Six: Tree Planting

48. What is your (estimated) overall tree holding currently?

Name of trees	No. of trees (estimate)	Amount of land covered (in ropes)	Planted by		
			Own labor	Public labor	Other
Eucalyptus					
Olive tree					
Wanza					
Acacia					
Yeferenj tid					

Yabesha tid					
Khat					
Coffee					
Oranges					
Tangerine					
Mango					
Hope					
Forage trees					

Others, specify……..

49. During the last three years did you sale trees (logs, splits, timber)? 1. Yes 2. No

50. If yes, mention the proceeds collected?

Year	Sale (Birr)
2001	
2000	
1999	

51. What measures do you think should be taken to improve tree planting and tree development in your locality?

……

Part Seven Agricultural Extension Services and Input Delivery

52. Did you receive agricultural extension service during the past three years? 1. Yes 2. No

53. If yes, which one of the following services did you get?

	Service type	1. Yes	2. No
1	Counseling and information		
2	Agricultural inputs supply		
3	Credit service		
4	Training service		

54. Did you apply commercial fertilizers in the past three years? 1. Yes 2. No (Skip to q. 69)

55. If yes, what type of fertilizers did you apply? 1. DAP 2. Urea 3. Both

56. Mention quantity of fertilizers used?

Fertilizer type	Quantity (K.G)
DAP	
Urea	

57. Sources of chemical fertilizers applied?

1. Wereda agr. Office 2. FSC 3. ASCA 4. Purchase from traders

5. Others, specify…….

58. Why did you not use chemical fertilizers?
……..……..

59. Did you apply pest control chemicals in the past three years? 1. Yes

2. No (Skip to q. no 72)

60. Sources of modern treatment (drugs) applied?

1. Wereda agr. Office 2. FSC 3. ASCA 4. Purchase from traders

5. Others, specify…….

61. Did you apply improved seeds in the last three production years? 1…..Yes 2…..No (Skip to q. no 75)

62. If yes, types of improved seeds applied?

1. Cereals 1 2. Cereals 2 3. Pulses 4. Oil seeds 5. Perennial crops 6. Vegetables

7. Others, specify…….

63. Sources of improved seeds?

1. Wereda agr. Office 2. FSC 3. ASCA 4. Purchase from traders

5. Others, specify…….

64. Why did you not use improved seeds during the last three years?
……..……

65. Did you receive credit in the past three years? 1. Yes 2. No

66. If yes, answer the following?

Credit type	Source of credit				
	FSC	ACSA.	WB	Food Security	Individuals
Ox					
Cow					
Sheep and goat					
Seeds					
Farm implements					
Micro-finance					

Others, specify……

68**.** Did you receive any training during the last three years by the FA/Woreda offices of agriculture?

1. Yes 2. No (Skip to next part)

69. If yes, how many training courses did you receive? A. 1-3 B. 4-6 C. 7-10 D. More than 10

70. What were the types of trainings you received?

1. Crop development and protection 2. Livestock rearing and forage production

3. Forage development 4. Soil and water conservation

4. Others, specify……..…….

71. How did you get the trainings you received in your agricultural business?

1. Very useful 2. Moderately useful 3. Least useful 4. Of no use

Part Eight: Soil and Water Conservation Activities

72. Do you experience soil erosion and /or fertility depletion on your plots? 1. Yes

2. No (Skip to q. no 79)

73. Mention up to five reasons for soil erosion and / or fertility depletion in your village in general?

1		4	
2		5	
3		-	

74. Have you built soil and water conservation structures on your plots? 1. Yes 2. No

75. Which of the following structures are found on your plots?

Name of structure	Availability on plot 1. Yes 2. No
Stone bund	
Soil bund	
Terrace	
Kïttïr	
Drainage ditch	
Top drainage ditch	
Trench	
Pond (uncovered)	
Pond (covered)	

76. What do you think should be done in your area to improve soil and water conservation?
……
……

Part Nine: Relief Aid and Paid Public Works

77. Did you or other member of your household participate in the safety net program during the last three years? 1. Yes 2. No

78. If yes, in which of the following years did you participate? 1. 2001 2. 2000 3. 1999

79. Did you or other member of your household participate in the "feses" program during the last three years? 1. Yes 2. No

80. If yes, in which of the following years did you participate? 1. 2001 2. 2000 3. 1999

81. Did you or other member of your household participate in the *anquarari* program during the last three years? 1. Yes 2. No

82. If yes, in which of the following years did you participate? 1. 2001 2. 2000 3. 1999

83. For how long does your household sustain itself from own food production during average production year? …… (months)

84. For how long does the household sustain itself from own food production during above average (good) production year? …… (months)

85. For how long does your household sustain itself from own production during low production year?.....(months)

86. Did your household face shortage of food during the 2000 belagi drought? 1. Yes 2. No

87. If yes, what strategies did you employ your household employ to mitigate or prevent the impact of the food shortage?

……
……
……
……

88. What do you think should be done to mitigate or reduce the impact of drought in your community?

……
……
……
……

Appendix 3: Criteria employed for research district selection

a. Highland or mid-highland agro-ecology
b. Relatively high density of population (based on experts' opinion)
c. Repeated history or occurrence of droughts, famines and chronic (persistent) food insecurity
d. High level of moisture stress or low annual precipitation
e. Relative high vulnerability to food insecurity
f. A degraded environment, especially degraded environmental land resources (e.g. deforestation, de-vegetation, soil and water loss)
g. Availability of current or past environmental rehabilitation, conservation and development programs or projects
h. Availability of diversified farming systems
i. Low forest coverage and high vegetation loss
j. History of drought-induced migration
k. High level of shortage of land
l. Reasonable distance from Dessie and accessibility (the selected ethnographic site is more than 60 kms, from the zonal seat, Dessie town)
m. Non-availability or limited ethnographic or related research in the past especially that relates to the current research subject
n. Availability of current or past food aid and related programs, and
o. Overall representativeness of the environment and socioeconomy of the zone

Appendix 4: Criteria employed for research FA and villages selection

a. High human and animal population density? (Based on experts' opinion)
b. History and experience of drought and famine, especially the 1974 and 1985 droughts and famines
c. High level of land degradation (soil erosion, deforestation etc) or exposure to such problems
d. Experience of government induced villagization and displacement of people into other areas through resettlement programs because of problems of environmental degradation
e. Availability of long-standing residence not affected by villagization or resettlement directly
f. Past or present environmental resource conservation programs such as construction of bunds and trenches
g. Past or current experience of relief food aid and related programs
h. High shortage of cultivable and grazing land
i. High or mid-highland climate
j. Low level of rainfall or annual precipitation
k. Existence of diverse farming practices
l. A settlement pattern offering neighborhood communities
m. Networked by road to district seat and other country sides
n. Generally food insecure or vulnerable area
o. A community or communities offering at least 500 people (primary groups)
p. Relatively speaking lesser cultivation of the stimulant tree crop known as *khat*

Appendix 5: Main characteristic features of the *gäbbar* land tenure

Factors of land management	Reign of Menelik II	Reign of Emperor Haile Sellassie	Rue of Dergue	Rule of EPRDF
Land-use decision making	Individual tax-payer's	Individual tax-payer's	Individual tax-payer's + government	Individual tax-payer's + government
Tenure security	Tax-payer is owner; no eviction from land as far as obligations are fulfilled; the landlords had the right to evict a tax-payer rendering him *nik'ul* & the land "state domain land"); unpaid taxes were not postponed	Tax-payer is owner; no eviction from land as far as obligations are fulfilled; towards the middle of the period landlords were made unable to evict a tax- payer; unpaid tax were to be postponed as arrears or *bak'i gïbïr*	Tax-payer is possessor; all land owned by the state; no ultimate immunity from eviction yet with right for compensation	Tax-payer is possessor; all land owned by the state; no ultimate immunity from eviction yet with right for compensation
Obligation	Taxes and tributes paid in cash and kind (honey) as well as forced labor service	Same as before except that tax in honey was lifted; a 15 birr tax in cash imposed irrespective of size and quality of land and forced labor was lifted at a certain period	Tax paid in cash equally irrespective of size and quality of land; mandatory free public labor for community or government services; hidden costs in the name of socialist associations, "call of the mother land" and some others	Tax paid in cash equally irrespective of size and quality of land; mandatory free public labor for community or government services; hidden costs in the name of some associations other reasons

Factors of land management	Reign of Menelik II	Reign of Emperor Haile Sellassie	Rue of Dergue	Rule of EPRDF
Holding limit	Maximum of land with the capacities of 10 k'unna to 12 dawula grain tax (good relation and level of devoted service to the Fitwäddäd) and bribing the šäni, the local land redistributors and tax setters were the main criteria		Determined by government appointed land redistribution committees based on the head count of members of a household but not to exceed 10 ha. per household; friendship, kinship and bribery were additional illicit criteria	No major redistribution of land carried out to affect past landholding; number of newly born and marrying children re-dividing the household landholding
Holding quality	The best land in all terms taken by the regional overlord, administrators and the nobility	The best land in all terms taken by the emperor, the royal family, the regional overlord, administrators and the nobility	Determined by land ploughed as a tenant; location of residential house; relative land fertility of the entire PA & other geo-physical factors; and bribing the land redistribution committees	No major redistribution of land carried out; number of newly born and marrying children re-dividing the household landholding and indirectly affecting the quality of land
Land transfer	Tax-payer could transfer his holding to his heirs (relatives & non-relatives), exchange or sell it	Tax-payer could transfer his holding to his heirs (relatives & non-relatives), exchange or sell it	Tax-payer could transfer his holding to his heirs (relatives & non-relatives) but cannot exchange, mortgage or sell it	Tax-payer could transfer his holding to his heirs (relatives & non-relatives) but cannot exchange, mortgage or sell it; of recent transfer of land through lease for up to 25 years allowed by policy

Appendix 6: Major local terms employed to refer to categories of topsoil based on fertility (agricultural productivity)

Highly Productive Soil	Least Productive Soil
Dïbušït	Çinça
Bosäbos	Gäga
Kosi	Länt'a[246]*
Läm	K'oda*
Lïbbama	Bäräbäda
Anbbässa	Gäha
Dike	Bärgäg
Wäfram	Mähan
Wändé (male soil)	Kïrït
	Bulçit
	Allïççа
	Gät'aba
	Dänk'oro
	Dingaga
	Kontu
	Sété (female soil)

[246] * Most leached soils said to be not convenient even for growing grasses. It is customarily said that such a land has finished its *yafär muz,* the main essence of a soil.

Appendix 7: Estimated percentage distribution of soils in the main research and their neighboring villages

Color name		Estimated percentage distribution[247]						
Amharic	English	Mïsïräta	Awraççça	Absaro	Binne	Kibi Meda	Shola Gända	K'es Gända
T'ïkur	Black	-	50	71	-	100	100	64
K'eyy	Red	60	21	-	-	-	-	36
Bunnam	Brown	15	-	-	-	-	-	-
Näççç	White	-	-	-	-	-	-	-
Dalačča	Grey	25	29	29	100	-	-	-
Käsäl	Deep	-	-	-	-	-	-	-
Color name		Estimated percentage distribution						
Amharic	English	Lenço	K'ädida	W.R. Ruga	Bultum	Säybäro	Hulluk'o	B.*
T'ïkur	Black	71	71	43	43	100	20	100
K'eyy	Red soil	-	-	-	-	-	-	-
Bunnam	Brown	-	-	-	-	-	-	-
Näççç	While	-	-	-	-	-	-	-
Dalačča	Grey soil	29	57	57	100		80	-
Käsäl	Deep	-	-	-	-	-	-	-

*Bäk'alo

[247] White and deep black soils are quite insignificant such that they are not accounted in the percentage distribution. The former is very easily workable during plowing; the latter is even lesser than this in distribution.

Appendix 8: Characteristic features of the major soil types and their agricultural qualities

Black Soil	Red Soil	Brown Soil
-During dry time difficult to work b/se of forming clods (workability) -during dry time it develops fractures -during rain it becomes muddy, sticky and difficult to work (workability) -When dry it wears plowshare faster The depth of the fertile top soil is very shallow -Its moisture retention capacity is less -It needs lots of manure and chemical fertilizers -It is vulnerable to mabïräk more than other types of soils.[248] -Women use this soil for pottery production -It is also known by the additional names märäre and walka -Since the lower part of the soil is compact, plants growing on it spread their roots on the upper part of it. The compact part is hard and dry for lack of permeability or lack of moisture content	-It is softer when plowed, unless during dry times in which it develops colds -It is not difficult to work during wet time (nish) as well as during excess rain-It has the quality to absorb water quickly -It absorbs sun heat quickly and thus has lower moisture retention capacity because of evaporation -It economizes plow and plowshares, does not have clods, it is fertile down to the depth; -It needs a longer plow for plowing -It is not convenient to application of chemical fertilizers because of the high slope gradient in which this soil is mostly found -It is also applied for pottery production and wall decoration -It is also known by the name *šäkïla afar*	-It is not difficult to work both during dry and wet times -It has good quality of retaining moisture more that all other soils -It is course textured; the inside is porous It does not need fertilizers that much because of its good fertility (bosabosinat) -Because of its high fertility (läm) it develops more weeds than other soils -

[248] Farmers believe that the soil has got metallic quality (melting substance) underneath which attracts the *mabïräk.* Traditionally farmers believed that *mabïräk* is caused by the hanger of Qoti and the Sheiks. A junior secondary school principal in the area suspected that since the fractures could retain water underneath that might attract electric current causing mabïräk.

Appendix 9: Traditional and modern physical soil and water conservation structures in Gäddärro and their periods of introduction

S.n.	Name of structure	Type		Introducing regime			Durability		Use of labor	
		Tradi-tional	Modern	A	B	C	Temporary	Permanent	Private	Public paid
1	Terrace	X					X		X	
2	Leafy matters	X						X	X	
3	Stone bund	X			X				X	X
4	Soil bund		X		X			X	X	X
	Soil & stone bund		X		X					
5	Trench		X			X	X		X	
6	Furrow drain	X						X	X	
7	Cut-off drain		X			X		X		X
8	Check-dam		X			X				
9	Eyebrow basin		X			X				
10	Micro-basin		X			X				
11	Contour plowing	X					X		X	
12	Tree planting on terraces / bunds		X		X			X	X	X
13.	Rainwater harvestin		X			X		X	X	X

A = Haile Sellassie I regime (0)

B= Dergue regime (4)

C= EPRDF regime (6)

Appendix 10: Biological soil conservation measures in use in Gäddärro

S.n.	Name of structure	Type	
		Traditional	Modern
1	Fallowing	X	
2	Inter-seasonal	X	
3	Forced fallowing	X (recent)	
4	Crop rotation	X	

Appendix 11: Gender and age-based agricultural division of labor

Activity type	Source of labor				Time of Activity											
	Men	Women	M. child	F. child	S	O	N	D	J	F	M	A	M	J	J	A
Field sanitation	X				■							■				
Digging field margins	X									■	■					
Applying trash, manure on fields	X	X	X	X				■								
Plowing	X		X				■			■	■		■	■		
Planting	X								■			■			■	■
Weeding	X	X	X	X	■										■	■
Šilšalo	X												■	■		
Çaro	X		X										■	■		
Beast watching*	X		X		■	■										
Harvesting (Cutting, piling)	X	X	X	X		■	■	■								
Transporting to threshing ground	X	X	X	X		■	■	■								
Threshing	X		X			■	■	■					■	■		
Transporting yield to home	X	X	X	X		■	■	■					■	■		
Asana**	X				■										■	■
SWC***	X									■	■		■	■		
RWH****	X		X													

*This involves especially birds and porcupines.

**This is done for red sorghum and maize alone in which some of the leaves are removed to facilitate further growth of the crop and use the bioms as livestock feed.

*** Soil and water conservation activities involve the building of new structures as well as the maintenance and demolishing of old.

**** Rainwater harvesting especially for garden development. It does not have specific timing and could be done at any time of the year when farmers are in general slack period or find time for various reasons.

Appendix 12: Local perceptions of categories and attributes of rain

Rain type	*Concept Involved*	*Agricultural Impact*	*Ecological Impact*	*Social impact*
Falling in the day	Temporal, economic, social, ecosystemic	+ Medium	+ High	-Very high
Showering lightly	Quantitative, ecosystemic	+ High	+ High	Indirect
Not eroding soils	Economic, ecosystemic	+ High	+ High	Indirect
Not destroying crops / plants	Economic, ecosystemic	+ High	+ High	Indirect
Not beating animals	Economic, ecosystemic, religious	+ High	+ High	Indirect
Falling on season	Temporal, economic ecosystemic, cultural	+ Very high	+ Very high	Indirect
Interspersed with sunlight to allow more heat than water	Quantitative, temporal, economic	+ High	+ Medium	+ High

Appendix 13: Local perceptions of the timing of rain and its agricultural merits and demerits

Rainfall time	***Agricultural effect***
If there is rain in May (Gïnïbot)	The crops in the field will not suffer from lack of moisture or heat *(gama)* till kïrämït (main rains) arrive
	The grasses will sprout sparing the livestock from feed shortage or hunger
	They used to say if it rained in Gïnïbot "get your grain pit well prepared". That was to mean there would be bumper harvest
	This rain is valued not only for the crops and the livestock but also for the people and the land itself as the weather will be cooler in this otherwise hottest month of the year
	But nowadays what is desired during this month is just *abbïll assïll* rain; just a day or two-day's rain is enough
If there is rain in June (Säne)	There is no need of rain during the whole of this month; the fields prefer to stay without rain.
	Farmers call this rain *nak'ärïsa*, cancer, in order to emphasize its negative agricultural effects
	Crops sowed in Miazia will develop pests if it rains in this month
	Therefore, the past elders used to say rather than living on a land receiving rain in this month it is better to move to other places where it has not rained in order to beg
	The land will become cooler and inconvenient for pulses to be sown in *kïrämït*. These crops do not fill their grain well in this condition. However, *yämïrïk* (awn) crops and teff will do quite well. These latter crops and horse beans also do quite well if the whole of the month is dry. "If the sun eats the land" is the local expression used to show the positive effect of sun during this month. Therefore, farmers say if it does not rain in this month the land accepts all the 12 kinds of crops in the next season.
	This rain is not desirable even to the animals as the fields do not sprout even the hated weed called *akk'anchira.* It is said this happens because the land becomes cooler. This rain is not liked even if the month before it was dry.
If there is rain in July (Hamlé)	The rain of this month is desirable to the crops unless it is heavy, that is without having a water logging effect.
	It is desirable for the animals as well as it lets the grasses and the *akk'anchira* to sprout quite well
	The people of the past used to say if the rain missed even for a day that will reduce something from the stock of food the family needed for a year. They used to say missing rain in a *kïrämït* day was scary. However, today the land prefers to have rain between every two days (that is a day's rain and two days' sun heat). Farmers said this is so because of worn out land and the transformation of time that is a change in the *wäk'ït*. They said in the past their land was "thick" to mean a deep top soil. They were not used to softening the land as the children of today do. They were not used to removing the sorghum stalks and cleaning the stumps in the fields when they saw their *bïllagi* crops. Hence, they used to cut the *k'ït''tïyyo* or *gäbo* and feed their animals.
If there is rain in August (Nähase)	Same as above
If there is rain in September (Mäskäräm)	This rain is highly desired for the crops. The crops are on early grain filling stage, crops prefer if there was rain the whole month.
	For the animals it will enable the *magät'ï* and the grasses in the hills to stay green.
	However, if the rain is *kïffikkïf*, it will cause the formation of crop worms
If there is rain in k'uagumé (the 13th month	It is said the value of *k'uagumé* is like the value of one full month
	It is belived that this rain will render the force of sorcery ineffectual
	For the land it is not good since it creates the pests. The heads of red sorghum shall develop

Rainfall time	***Agricultural effect***
of Eth. Calendar)	warms from it. The crop teff shall also develop worms. This rain causes worms on horse beans, field peas, lentils and the rest of the crops as well
	While no rain during this period is good for the crops, farmers said this becomes an opportune moment for the sorcerers known as *dingay t'ay* and *dïgïmïttäña*. Therefore, they want this rain in order to protect the homestead or *k'äyé* from the attack of sorcerers.
If it rained in October (T'ïk'ïmït)	The rain of T'ïk'ïmït is said to be medicine to the land. This means that it lets the land wet and eases the *gïmïša* plowing for *bïllagi* crops. However, it damages the crops as most of them are ripe by this time and needs to be cut. Maize, lentils, and field peas need to be collected at this time hence if the rain is a bit repeated they will be damaged in the fields. The buds of horse beans shall also burst and become useless. The red sorghum will also develop small hairs on its grains. But a day's rain shall not damage any ripe crop unless the rain is somehow repeated.
	It is good for the livestock as the grasses will sprout and the dry bioms will become wetter.
	Whatever the case, farmers desire a day's rain in T'ïk'ïmït to soften the soil or let it less difficult for the forthcoming bïllagi's gïmïša
If it rained in November (Hïdar)	Rain is not needed at all in this month. It destroys all crops in the fields and those collected on the threshing grounds. This is the month for collecting harvests. Even a day's rain is averse as it attracts fog or hurri in its wake which could last for several days. The rain attracts hurri. This is called *saba*, which means it will attract rains after some time.
If it rained in December (Tahïsas)	Tahïsas is the month for doing gïmïša on zängada k'urän, hence if it rained once or twice the land needs it in order to soften it for gïmïša and ayama as well.
	Since the month is one of the coldest it becomes even coldest and this is bad for the livestock. It is said this rain could cause a well-fattened ox to shrink and lose much weight.
If it rained in January (T'ärr)	This is the planting time for belagi. Thus it is not bad if it were to rain the whole month
	It is good to the livestock as well
	Elders of the past used to call an iron stick sorghum planted during the advent of this month. This was to mean there will be a very high yield. If it does not rain in Tärr that means a complete loss to bïllagi crops. The rain is also good for the land; it does not have damage since the next month is also sunny and dry.
If it rained in February (Yäkkatit)	The past elders used to say if there was rain in this month the right thing was to plant oats, since it did exceptionally very well.
	Since it softens the land for gïmïša it is also preferred in this way.
	It lets the grasses to sprout thus being beneficial to the livestock as well.
	But it is not good if the rain continued after the 15th of the month till the whole of the next month which is Mäggabit. This later period is wanted to be sunny in order to dry the wïran in the fields
	The month is also one of wedding and sädäk'a feats
	Bïllagi crops generally need limited precipitation than other seasons crops
	Hence useful rain that does not affect the merry making, that does not affect agriculture and that does not trouble both humans and animals is wished during this month
If it rained March (Mäggabit)	It is almost like Yäkkatit.
If it rained in April (Miazia)	The rain of this month is the most important rain agriculturally. They call it balabbat, meaning the "lord of rains".
	If it is possible to have moisture or nïšš enough to allow sowing the rains of a day or two is said to be enough. If it rained heavily the fields will become muddy, plowing will become difficult and the crops sown will not thrive well after germination. However, once the fields are covered with seeds it is not problematic if the rains repeat without getting much.

Appendix 14: Monthly rainfall distribution in mm for Wärräbabbo district (1988-2005)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1988	13.4	123.9	4.5	143.1	38.1	41.3	558.1	381.4	276.8	52.9	0.0	0.0	1633.5
1989	16.9	93.6	178.8	118.5	24.6	21.0	173.4	233.9	97.6	-	-	-	958.3
1990	24.6	-	103.4	167.9	2.0	15.7	304.1	-	-	-	0.0	-	617.7
1991	11.2	45.4	95.7	48.0	99.9	17.8	333.4	307.2	193.7	38.9	0.0	47.4	1238.6
1992	85.6	54.7	87.2	57.2	107.2	10.2	136.9	396.5	206.2	88.4	24.5	26.1	1280.7
1993	63.0	80.8	14.0	181.0	165.2	4.8	275.0	154.8	186.2	133.8	0.0	13.3	1271.9
1994	0.0	0.0	78.8	76.2	42.8	21.0	410.5	268.0	169.2	2.0	52.1	26.1	1146.7
1995	0.3	52.6	55.8	246.1	86.9	27.5	271.7	231.5	130.5	54.2	0.0	113.5	1270.6
1996	28.3	5.0	102.4	138.3	-	-	-	-	-	-	-	-	274
1997	28.4	0.0	140.9	50.2	8.8	103.6	286.2	233.4	181.1	213.5	62.9	65.4	1374.4
1998	11.7	37.4	76.5	104.9	38.6	0.0	540.8	243.6	170.8	63.4	0.0	0.0	1287.7
1999	27.0	3.2	49.9	10.6	4.4	7.7	282.3	442.3	86.6	96.8	0.6	0.0	1011.4
2000	0.0	0.0	20.0	-	66.5	28.9	408.8	357.3	114.8	60.6	33.7	38.5	1129.1
2001	6.6	16.0	239.8	43.4	84.5	55.2	425.9	312.2	-	6.8	0.0	3.5	1193.9
2002	41.3	11.7	88.2	155.9	171.8	5.0	348.2	325.8	166.8	25.0	0.0	84.5	1424.2
2003	23.8	28.1	55.1	131.8	0.0	66.9	210.2	329.5	135.6	32.7	24.0	49.5	1087.2
2004	23.1	15.0	124.9	184.8	1.3	54.2	255.9	266.9	105.0	38.9	82.3	10.0	1162.3
2005	19.1	1.3	33.1	218.8	132.4	59.7	319.3	288.8	74.8	41.1	18.7	0.0	1207.1
Total	424.3	568.7	1549	2076.7	1075	540.5	5540.7	4773.1	2295.7	949	298.8	477.8	20569.3

Sources: National Meteorological Services Agency, 2009 and Water Action, 2009

Appendix 15: Local judgment on major food crops grown

Food service	Cereal crops grown (rank)					
	Wheat	**Barely**	**Teff**	**Oat**	***Zängada***	**Maize**
Taste	4	1	3	2	6	5
Calorie / nutrition	6	1	4	2	3	5
Hunger prevention	5	1	4	2	3	6
Aesthetics	1	4	2	3	6	5

Appendix 16: Ecological impacts of major crops grown (farmers' perception)

Ecosystem service	Cereal crops						Legumes
	Wheat	**Barely**	**Teff**	**Oat**	***Zängada***	**Maize**	**Beans**
Prevention of soil erosion	4	4	5	4	1	2	3
Enhancement of soil nutrients	2	1	3	2	4	1	1
Soil formation	3	5	1	3	2	4	5
Moisture retention							
Drought resistance	3	5	1	4	2	5	6
Most affected by pest	6	2	4	6	3	2	1
Resistance to water logging	4	4	1		2	3	5
Soil fertility demand	1	1	1	1	1	1	1
Land preparation	3	3	3	2	3	3	1*
Weeding requirement	3	3	3	3	3	2**	1

** A few farmers started last year to do gïmïša for beans due to the influence of extension education given by government agricultural experts.*

*** In the case of maize, once šïlïšalo is done, the second weeding, çaro can be forgone if the level of weed infestation is found to be lesser.*

Appendix 17: Productivity of crops (traditional varieties?) of all varieties grown in Gäddärro FA during 1999 production year

Crop name	Productivity (qls./ha.)	Crop name	Productivity (qls./ha.)
Teff	11	Potato	100
Barely	14	Onion	52
Wheat	14	Garlic	49
Millet	9	Red pepper	11
Oat	9	Netch azmud	4
Sorghum	18	Tikur azmud	4
Maze	18	Coffee	4.5
Horse pea	11	Hope	12
Field pea	9	Khat	5
Chickpea	7	Orange	130
Lentil	6	Tangerine	165
Guaya	9	Banana	60
Nug	5	Papaya	150
Linseed	4	Guava	90
Fenugreek	6	Peach	75
Sesame	5	Other fruits	95

Source: Gäddärro FA Agricultural Development Office

Appendix 18: Productivity of most of the crops grown in Wärräbabbo

Crop name	Modern variety used	Yield per ha.	Traditional varieties used	Yield per ha.
Wheat	HR 1685	20	Various	17
	HR 604 (to some extent)	20		
Teff	The farmers in the district still use traditional varieties only. Even though farmers have been requesting for improved seeds their requests have not been met as yet. In the 2001/2002 production year a quintal of the improved variety known as cross-37 has been approved to be purchased from the Sirinka agricultural research station. But due to shortage of budget it is unlikely that the seeds shall be made available this year.			12
Barley	Farmers in the district grow traditional varieties. There have been no improved varieties distributed to the farmers as yet.			16
Oat	All traditional varieties; no modern ones			11
Millet	All traditional varieties; no modern ones; it is produced just in 01 and 06 FAs.			10.5
Sorghum	The local ones are Hawa Gizaw (mainly grown in 02 PA); godalet (white colored). Abshiro and gobiye are modern varieties developed at Sirinka research center mostly they are grown in the low land parts of the district. However, generally farmers in the district use traditional varieties			27
Maize	Awassa 511			30
	Catomani			
	PHB 3253	This was distributed recently. 13 quintals were bought from Pioneer Hi-bred Seeds Ethiopia PLC at a cost of 1920 Birr per quintal. It were distributed to farmers in 02,04,06, 07,08 and 09 FAs freely.		
		There are traditional varieties grown as well		

Appendix 19: Soil requirement of crops

Crop type	Ambient ecological condition
Maize	Needs fertile soil for best performance. It does not thrive well on black cotton soil which is susceptible to water logging. The plants become yellowish
Horse beans	Same as above, requiring land with high infiltration capacity
Wheat	Same as above
Barely	Needs most fertile soil first of all
Teff	Can thrive well on intermediate to fertile soils but becomes yellowish from problem of water logging
Field pea	It prefers infertile çinça land. On fertile or dïbušït land it suffers from overgrowth
Lentil	Same as field pea
Linseed	Can thrive both on fertile and infertile soils
sorghum	Can thrive on all soils but could be stinted on infertile or çinça land
Oat	Prefers fertile soil but do not do well on black cotton soil
Red pepper	Performs well on fertile soil; it does not do well on water logged soil
Potato	Same as red pepper
Garlic	Prefers intermediate fertile soil. It does not grow well on çinça and water-logged land
Khat	Can thrive well on all soils but can give better harvest on walka land during dry times
Eucalyptus	It thrives in all soil conditions. It grows so fast on dïbbušïit land while it takes time on infertile land.

Appendix 20: Households who planted horticultural crops in 2008/9 production year

Crop type	No. of HH planting
Çat (Khat)	55
Coffee	13
Orange	35
Tangerine	6
Mango	16
Hope	11
Casmir	10

Appendix 21: Major tree and bushy woods used as animal forage during the 2008 drought

Trees	Parts used	Bushy woods	Remark
Eret	Whole part	Ambuačo	
White	Twigs, leaves, bark		
Partly red	Twigs and leaves		
Wanza	Twigs, leaves		
Olive tree	Twigs, leaves		These feed were served after they wilted to prevent their hot quality
Endod			
Šola			
Ak'äläwa			
Bune			
Embïs	Twigs and leaves		
Red			Eaten just for a moment out of
All leaves			For goats

Appendix 22: Major trees and their ecological attributes

Tree Name			Major ecological attributes in relation to farming	
Amharic	**Common name**	**Botanical name**	**IEK**	**WSK**
Woira	African olive	*Olea africana*	The leaves contribute the least to soil formation but are considered quite nutritive as fodder along with gïrar and wanza; the roots are acidic and consume much water drying up the surrounding area. Unless the branches are lopped, it has a negative shading effect on crops growing around. Spatially, it is adversely related with field crops. Germination is difficult if transplanted.	Seeds have 60% germination capacity for establishment. It is slow-growing and prefers well drained soils. It has a 12-month nursery production time.
Tidh	-	*Juniperus procera*	The roots have the same negative effects as olive trees. It has the same negative effect on crops. Grasses do not thrive well in the surrounding of this tree. Spatially it has negative effects both on crops and grasses. As a result most of the remnants of this tree are found on cliffy and marginal hill lands	It has a 20-30% germination in two months and a nursery production time of 12-15 months
Wanza	-	*Cordia africana*	Its leaves are positively noted for contribution to soil formation. Its roots attract moisture so that it is planted in mix with such crops as coffee (also for its positive shading effect). It has a limited negative shading effect. Planted among coffee trees as also recommended by science.	Recommended to grow on crop land. It is easy to raise and fast growing.
Bïsanna	-		The leaves contribute to soil formation. The roots attract moisture though not as good as wanza and do not stiffen the land around as do olive tree and tid. It does not have a negative shading effect that much. Germination is difficult in the case of transplantation. It has a partial negative shading effect on field crops.	

Tree Name			Major ecological attributes in relation to farming	
Amharic	**Common name**	**Botanical name**	**IEK**	**WSK**
Gïrar	-	*Acacia albida*	Its leaves have negative shading effect. Its roots are good for the soils since which they fertilize. Its leaves are not good for composting manure. The leaves of white gïrar are good source of livestock feed especially during droughts.	It is a nitrogen fixing and fodder tree
Qäy bahïrzaf	-	*Eucalyptus camaldulensis*	Generally leaves not eaten by livestock. It absorbs too much water drying up the surrounding ecology. The roots and also the leaves are believed to be acidic also affecting easy permeability for stiffening the land and the leaves blocking the surface. Agriculturally, it is negatively correlated with crops and livestock.	Drought-resistant with a root system covering large areas
Näç bahïrzaf		*Eucalyptus globulus*		

Appendix 23: Household tree planting in 2008/9 (R= 105= 88 MHHs; 17 FHHs)

Planted tree		HH Type	No. of HHs	Quantity Planted	Source of Seedling (Nurseries)					
English / Scientific name	Amharic name				Own	GO	Gift	*P	Wild	Own & GO
Eucalyptus*	Bahr zaf	MHH	87	33,521	27	43	2	3	0	9
		FHH	17	2,597	2	9	2	3	0	0
African olive	Wäira	MHH	24	269	7	1	0	0	16	0
		FHH	4	67	1	0	0	1	2	0
Cordia africana Lam.	Wanza	MHH	40	221	5	20	1	0	14	0
		FHH	7	61	1	2	0	0	4	0
Acacia abyssinica	Gïrar	MHH	23	639	3	3		16	0	0
		FHH	1	7	0	0	0	1	0	0
Cupressus lucitanica	Yäfärän ğ Tïdh	MHH	43	1,577	4	34	0	2	0	2
		FHH	8	323	2	6	0	0	0	0
Juniperus procera	(Yabäša) tïdh	MHH	43	745	2	25	3	0	12	0
		FHH	5	60	0	4	0	0	1	0
Forage trees	Yämänn o zaf	MHH	76	10,841	28	42	1	1	0	3
		FHH	12	577	4	6	1	0	1	0
Total				51,505	86	19	10	27	50	14

*=Purchae

Appendix 24: Information on estimated tree ownership per household

Crop name		Households with productive trees	HHs with non-productive trees	HHs with both
Coffee	M*	49	14	1
	F**	5	5	2
Khat	M	60	33	2
	F	7	8	0
Orange	M	34	29	11
	F	7	9	0
Hope	M	58	0	0
	F	8	0	0
Guava	M	24	11	0
	F	4	2	0
Apple	M	12	35	1
	F	0	3	0
Lemon	M	9	2	1
	F	1	0	0
Casmir	M	5	19	2
	F	0	2	0
Avocado	M	3	30	0
	F	0	5	0

M= Male headed households

F= Female headed households