1. INTRODUCTION

1.1 THE PROBLEMATICS OF THE HEGEMONIC ADAPTATION PERSPECTIVE

Adaptation to climate change has become a hegemonic concept at global level. This hegemonic discourse not only influences research agendas but also directs the way development is being practised. This global mainstream perspective on adaptation is founded on special sets of concepts and practices that form the general context in which the term adaptation directs particular activities at local levels. Within the international community, adaptation is articulated on the basis of specific understandings of the term that shape the entire process of formulating and disseminating knowledge surrounding the concept. In this regard, the international adaptation policy is the crux of the mainstream international adaptation perspective. Interpretations of it influence central avenues of comprehension in respect of vulnerability and adaptation and the way that it is put into practice in adaptation implementation.

There is a widely accepted consensus and growing concern that global climate change is triggering significant social and ecological transformations that will heavily jeopardize the livelihood of populations in developing countries. Many of the developing countries are considered as the most vulnerable to climate change. Accordingly, with regard to addressing the issue of climate related risks, developing and developed countries have been assigned collective but distinct responsibilities under the United Nations Framework Convention on Climate Change (UN, 1992: Article 1). In more specific terms, developed countries are expected to support the adaptation activities implemented by developing nations as part of ongoing development assistance and cooperation (UN, 1992: Article 4(4)). Even though there is an increase of funding to financially support adaptation measures undertaken in developing countries, there remains a gap in understanding how these adaptation measures are directed to support the needs of the locals in developing countries.

Although climate change, manifested through environmental hazards, is a 'real' environmental issue 'out there', the way it is portrayed and responded to is socially constructed, being dependent on 'social frames'. In other words, while the predominant drivers of climate change operate within the broad scales of the global politcal economy, the aggregate impacts of climate change are most felt at the household and community levels. Within development policy and academic circles it is widely accepted that climate change is an environmental problem arising from atmospheric emissions. The depiction of the problem of climate change as arising from the accumulation of greenhouse gases in the atmosphere, and the consequent biophysical hazards, has completely diverted attention from

problems embedded in social, political and economic structures. The problem of climate change could have been formulated in other ways by emphasizing the structural forces of the capitalist economy as the major driver of greenhouse gas emissions and thereby disruptions of livelihood and destitution (Demeritt, 2001). This line of argument brings to light the partiality of the scientific construction of climate change. The scientific depictions of climate change impacts, responses and causes are shaped by different discourses. The scientific understanding of climate change impacts neglects other crucial concerns, such as inequality and development, when seeking suitable responses at various levels (O'Brien and St. Clair, 2007; Liverman, 2009).

The dominant perspective on adaptation that gives primacy to climate stimuli underestimates processes of development that impact livelihoods in developing countries. Such an underestimation also influences our focus and understanding of risk management and livelihood responses that are mainly developed through the communities' interactions with their environment. A sole focus on climate stimuli cannot capture politically, socially, institutionally and legally complex responses.

Because the natural environment is seen as the root source of the climate change problem, the responses to this problem are also framed as a scientific endeavour that shields humanity from wild nature (Cass and Pettenger, 2007). This understanding of climate change, which gives primacy to biophysical elements while neglecting social and political factors, underscores nature as the main source of danger. This leads to the understanding of vulnerability as an outcome of biophysical factors (Gaillard, 2010). This is clearly a result of the dichotomy between science and politics. This dichotomy is also reflected in the representation of the Intergovernmental panel on climate change (IPCC) as an 'upstream' independent organ with the mandate of compiling scientific solutions, which feeds information to politicians and decision makers located in the 'downstream policy process' (Demeritt, 2001). The constructed distinction between science and politics and between fact and value is entrenched in the climate change sphere. Science and politics, however, are mutually linked (Forsyth, 2003; Cass and Pettenger, 2007; Demeritt, 2001; 2006). Furthermore, the dominant framing of climate change adaptation puts biophysical environmental factors at the centre of community problems. One cannot question the influence of the environment on the risk management and livelihood practices of local communities. However, the assumption that climate change is a natural problem has led to the de-politicization and de-contextualization of both the climate change problem and the solution to it. In relation to the emergence of a decontextualized dominant climate change discourse, Forsyth (2003: 14) argues that the framing of an "environmental explanation…may be based on…norms of one society" and this environmental knowledge has been reproduced in other contexts where values and norms differ.

Even though the vulnerability paradigm is gaining ground in the fields of adaptation research, the hegemonic international perspective on adaptation still maintains an event-centred framework of adaptation and vulnerability that deals with the actual or expected outcomes of climate change, including variability and

extremes (Schipper, 2007). In general, the hegemonic adaptation perspective frames adaptation activities as apolitical processes that are tied to actual or expected climate stimuli and hence these adaptation activities are isolated classifiable strategies independent of social processes of risk management and livelihood practices. Such a perspective has widely influenced development practices implemented by national governments by diverting interventions away from addressing the root causes of societal problems and solely focusing on dealing with climate stimuli. When this focus on distinct adaptation activities translates into development interventions, it completely misses the point that many of the environmental problems that rural communities experience emanate from the political economy and historical trajectories of development interventions.

1.2 APOLITICAL ADAPTATION AND PASTORALISTS' DEVELOPMENT

The way particular regions in the world are imagined is a result of cultural orientations towards these regions, which in turn also determine the construction of vulnerability in these regions (Bankoff, 2001; 2004). In the context of disasters, Bankoff contends that 'vulnerability' itself is a discourse, related to discourses of 'development' and 'tropicality' that sustain a Western, hegemonic perception of regions (like sub-Saharan Africa; East Africa; arid and semi-arid regions) as 'more dangerous' than the temperate West. Commitment to the mainstream knowledge system regarding climate change and adaptation generates generalizations about pastoral communities which, to some extent, predetermine the nature of vulnerability assessments and thus determine adaptation trajectories. The understanding of vulnerability within the climate change adaptation realm has a particular conceptual framework that is sustained by a dominant discourse of adaptation as something that is distinct from development or disaster risk reduction. A science and impacts focus generates generalizations to the effect that environmental factors are the primary contributor to vulnerability in arid and semi-arid areas. From a biophysical science and impacts perspective, it is easy to see why these areas may be perceived as vulnerable; they are highly susceptible to climate variability and extremes which are exacerbated by climate change.

Ethiopia, with its more than sixty per cent arid and semi-arid land mass, is categorized as being particularly vulnerable to climate change by the United Nations framework of conventions on climate change (UNFCCC) (see particularly Article 4(8c), UN, 1992) and the IPCC (Boko *et al.*, 2007). The issue of climate change compounds these notions of extraordinary vulnerability. In popular science and the media, pastoral groups residing in arid and semi-arid environments are depicted in an apocalyptic manner as 'climate canaries' and 'the people most likely to be wiped out by devastating global warming' (Observer, 12.11.2006 cited in Morton, 2010). Pastoralists who reside in arid and semi-arid environments like the Karrayu in the Upper Awash Valley are widely pictured as extremely vulnerable. These prevalent pictures emanate from broader economic and geographic imaginings of the region as ridden with conflict, drought, famine, hunger, suffer-

ing and death. These constructs are further legitimized by Western media reports that give only a snapshot view of pastoral areas, as in the following case: "They have long lived on the margins, a way of life that was manageable as long as the rains were regular. But with relentless drought the margins are coming close to being impossible" (Fergal Keane, BBC, 17.11.06 cited in Morton, 2010).

The dominant framing of adaptation as a means of managing climate risks that solely focuses on climate change impact reduction seriously hampers vulnerability reduction. There is recognition of the concept of vulnerability in international climate change adaptation research. However, event-centred approaches to vulnerability and adaptation based on present and expected impacts of climate change still dominate the international climate change adaptation discourses (Schipper, 2007). The dominant framing of adaptation and vulnerability in climate change research sees adaptation as an apolitical intervention based on scientific solutions to environmental problems. The mainstream adaptation discourse, as a result of its discrete policy and funding agenda and disciplinary roots, remains primarily science and impacts focused. This has particular consequences for vulnerability reduction in the dryland areas of East Africa in general, and Ethiopia in particular, as it may serve to facilitate the further implementation of ill-planned policies for pastoral areas. Bankoff (2001) cautions that "commitment to a particular knowledge system … predetermines the kinds of generalisations made about the subject under investigation …" (Bankoff, 2001:29). The overemphasis on actual and expected climate impacts within the dominant discourse has also led to the assumption of adaptation as identifiable strategies irrespective of the broader social context and additional to development and disaster risk reduction. In situations where the influence of climate-related stresses surpasses the ability of local practices and knowledge to respond and deal with them, adaptation measures become necessary to tackle particular climate change impacts, such as drought. Conversely, in line with Schipper (2007), I contend that in the context of Ethiopian pastoralists in the semi-arid parts of the Upper Awash Valley, reducing vulnerability, which is framed by the locals as a politico-ecological problem emanating from the political economy of development, has little to do with minimizing the potential for negative climate change impacts. Hence, the reduction of vulnerability by transforming the social conditions that govern resource acess, allocation and management is a much more difficult and complex task than minimizing expected or actual climate change impacts in this context. However, due to the overemphasis given to climate change impacts, official funding and implementation of adaptation activities usually ignores social contexts, and is reduced to actions to tackle specific impacts of climate stresses. Thus, the 'adaptation to impacts' approach in climate change research is a reactive response to known climate impacts, rather than a proactive response to vulnerability that tries to address the broader political and ecological context.

In this regard, development interventions in pastoral areas are still fixed on technological and scientific solutions, at the expense of a social science oriented approach to generating knowledge about climate-related problems. A particularly prominent outcome of this in pastoral areas is a perceived need for scientific

certainty based on equilibrium assumptions, in order to proceed with adaptation for a very unpredictable and non-equilibrium environment. I do not deny the need for climate science research – this knowledge is always required to better understand the nature of future climate change challenges. However, lack of scientific knowledge and certainty is not what is hindering effective adaptation for the pastoralists in the dryland parts of Awash Valley. This prevailing perception detracts from the type of research – mainly social science research – that is urgently required if locally oriented adaptation trajectories are to produce effective outcomes for the pastoralists themselves. Improved scientific knowledge is not necessarily a priority for adaptation in the arid and semi-arid regions of the country; what is already known by 'experts' and local people are largely sufficient to proceed with effective adaptive actions. In order to better deal with environmental uncertainty, adaptation should be anchored in a sound local knowledge of disaster reduction, natural resource management and development. Though biophysical factors have an influence on local vulnerability, the overemphasis on geographical location leads to simplistic constructions concerning dryland areas and pastoralists which are overly pessimistic. This partial construction underemphasizes consideration of the people living in this dryland environment and their resilience, capacity, knowledge and agency; pastoralists possess a considerable capacity to cope with change and uncertainty. However, the neglecting of these capacities has led to displacement of the traditional mechanisms for handling vulnerability.

The tensions between national and local conceptualizations of vulnerability are historical and strong in pastoral areas of Ethiopia. For instance, the national discourses as they are reflected in various government documents consider the pastoralists' way of handling vulnerability as 'archaic', so that they need to be replaced with discrete interventions such as 'modern' settled agriculture. In many arid and semi-arid parts of the country, environmental challenges linked to climate change are indeed highlighting high levels of vulnerability. Climate change poses serious biophysical environmental challenges. However, pastoralists have been facing environmental uncertainty for generations and have a strong cultural tradition for dealing with it. I argue that the dominant scientific discourse of climate change vulnerability in dryland pastoral areas places an overemphasis on biophysical stresses at the expense of recognizing the importance of the socio-cultural, socio-economic and political factors creating vulnerability. The broad assumptions made about the nature of the challenges faced and solutions to them in pastoral areas, discourages consideration of socio-cultural capacity, resilience and agency. This shows the inability of biophysical causation to explain the impact of climate change. However, in this book, in line with recent studies such as that by Catley, Lind and Scoones (2013), I argue that pastoral areas are interlinked across space by the communities that live there, thus requiring a different approach to the meaning of development (and therefore adaptation). As insights from my study of the Karrayu pastoralists show, the trans-spatial nature of resources in dryland areas is a potentially valuable intrinsic component of resilience in the context of climate change and environmental uncertainty.

1.3 APPROACHING THE 'LOCAL CONTEXTS' FROM A POLITICAL ECOLOGY PERSPECTIVE

An understanding of local level and context-specific risk management and livelihood security has been approached from various disciplinary perspectives in the fields of sociology, geography, anthropology and development studies, using various perspectives such as sustainable livelihoods, natural resource management and disaster risk reduction. Each of these fields brings its own theoretical and conceptual framework and accordingly, there are many conceptual and methodological entry points to understand the way local people experience risks and how they manage these risks to their livelihoods. The perspective of disaster risk reduction, for instance, would approach adaptation as an amendment and build-up of local level activities so as to minimize the influence of vulnerability connected with hazards. On the other hand, the sustainable livelihoods perspective emphasizes strengthening local level resilience under conditions of climate-related shocks. Thus, clarifying the disciplinary orientation of this study is crucial before going further. In my research I have used the political ecology approach in order to understand risk management and livelihood security of communities at the intersection of society-environment-state interactions at the local level. This perspective helps us to locate the everyday livelihood and risk management practices pursued by rural people within the broader perspective of state interventions in the peripheral areas and the associated environmental transformations. Interactions between pastoralists and the state since the mid-20th century are the major historical factors that have laid the foundation for how today's pastoralists relate to and interact with their major resources – land and water. On the other hand, pastoralists-environment interaction in a non-equilibrium context is, and has always been, an ever-present phenomenon that plays a significant role in influencing the way livelihoods and risk management practices are pursued. In this regard, the variable and unpredictable arid and semi-arid environments in which pastoralists dwell requires a risk management and livelihood strategy that takes these variations into consideration. However, the pastoralists-environment interactions have been put out of balance through the historical trajectories of state development interventions that have resulted in different relational modes (property arrangements) to natural resources. State interventions in pastoral areas have not only disrupted pastoralists' relational modes to the natural resource base but have also brought in new resources that require societal reorganization and institutional rearrangements in order to adjust to the transformed environment. These disruptions in pastoralists-environment interactions has also resulted in increased susceptibility to the impact of drought, an increase in environmental degradation and food insecurity, and hence heavy dependence on outside support to sustain their livelihood and manage risks. Furthermore, the increase in frequency of extreme climatic variability will also likely compound many existing social problems.

Essentially, political ecology is a clear alternative to conventional 'apolitical' ecology (Robbins 2012). Political ecology, embedded in political economy, and to

some extent in critical theory, developed in reaction to what were perceived as narrow and deterministic views on socio-environmental relations and change, mostly with respect to issues of power (Paulson and Gezon, 2005; Blaikie, 2008). Despite encompassing a variety of theoretical and methodological orientations, scholars in political ecology share a set of assumptions and viewpoints, which have also oriented this work. A central assumption is that "politics is inevitably ecological and that ecology is inherently political" (Robbins, 2012:3). This understanding of societal and ecological processes as being fundamentally interwoven calls for an integrated analysis of social and material aspects of environmental change. For that, political ecologists emphasise the value of place-based research and methodological pluralism (Paulson and Gezon, 2005). Additionally, by focusing on how political-economy systems and relations influence, and are influenced by, the environment and resources, researchers in political ecology elucidate the importance of multi-scale analysis (Bailey and Bryant, 1997; Robbins, 2012). Accordingly, drivers of environmental problems are often approached and contextualized in the larger political and economic context rather than "blamed on proximate and local forces" (Robbins, 2012:13) such as population growth or inappropriate resource management practices. Likewise, by focusing on access to and control over resources and social relations of production, political ecology illuminates the many and crucial tensions and conflicts in strategic interests, experiences, knowledges and practices among and between individuals and groups socially differentiated by overlapping relations of power rooted in gender, wealth and ethnicity (Rocheleau, *et al.,* 1996; Paulson and Gezon, 2005).

The political ecology approach that pays attention to state-pastoral-environment interactions refines our understanding of risk management and livelihood practices. Accordingly, this study focuses on the intersections of the contextual sources of environmental change, conflict over resources and the political consequences of environmental change. In particular, anchoring risk management and livelihood security at the intersection of environmental resources and the associated relational modes (access, institutions and strategies) contributes to a better understanding of contextualized responses to changes in environment-pastoralists relations. However, as has been argued in section 1.1 above, in the field of climate research the problem of detaching nature (the natural environment) from societal process has seriously misguided the formulation of international adaptation policies and implementations at the local level. There is a consensus that both at the international policy level and at the local implementation level, there is a need to incorporate climate change adaptation as well as disaster risk reduction into broader development practices so as to reduce vulnerability. There have been continuous debates on how to join up these apparently separate issues (Schipper and Pelling, 2006; Schipper, 2007; Schipper, 2009; Gaillard, 2010). By approaching risk management and livelihood security through a political ecology lens, this dissertation contributes theoretically to the debates of nature-society research, and practically to the fields of development policy. In light of the foregoing, I formulate and frame the research problem in its

broader context in order to understand the risk management and livelihood security of the Karrayu in the face of socio-environmental changes in the Upper Awash Valley.

1.4 POINT OF DEPARTURE: RISK, RESOURCES AND RELATIONAL MODES

Pastoralism as a way of life and a source of livelihood in the arid and semi-arid lowlands of Awash Valley is rapidly changing as land resources are becoming increasingly scarce and as herders increasingly have to confront new Socio-cultural, economic, and ecological challenges. They use various coping and adaptation strategies built on principles of flexibility and mobility. These strategies involves spreading and managing risks through communal utilization of land and water resources, diversification of herd composition, increased engagement in trade, wage-labour and cultivation (Little *etal.*, 2001). Attempts by the herders to surmount these challenges play a direct role in influencing the pastoral transformation process, as well as eventual changes in the risk management and livelihood of pastoral households.

In the Ethiopian peripheral arid and semi-arid areas, pastoralists operate in a context of social, institutional and environmental changes. These changes are mainly rooted in historical state-pastoralists relations that have disrupted the relations of local pastoralists with their environment and thereby their livelihoods and risk management strategies. State-led development interventions in the fertile Metehara plains of Awash Valley have been implemented at the cost of the environment and livelihood of the pastoralist community, which are dependent on the Awash River and its abundant pastures. Accordingly, the modernization programme of the previous regimes that depicted the Awash valley as nothing but agricultural land up for grab disrupted the environment where pastoralists had practised risk management and livelihood practices organized around water, pasture and livestock for centuries. Consequently, they now face drastic ecological changes in environments suffering from severe overgrazing, erosion, dwindling herds and subsequent famine and death.

With the coming to power of the Ethiopian people revolutionary democratic front (EPRDF), however, the political atmosphere and rhetoric changed, and various policies and strategies that permit the devolution of power to regions and local levels were formulated. Accordingly, unlike the previous pastophobic regimes, in post-1991 Ethiopia pastoralists have been given spaces in the political arena where they may have a say in the processes of decision-making that influence their livelihood. Various policies and programmes that directly or indirectly impact pastoralists have been formulated and put into practice. However, as the international hegemonic adaptation to impact of climate change discourse has taken centre stage in the national development policy of Ethiopia, pastoralists are also expected to progressively transform their livelihood with the help of projects and programmes that help them ‘adapt to their environment’.

Accordingly, in the current discourses and practices of development in arid and semi-arid areas of Ethiopia, pastoralists' adaptation to climate change is pictured as necessary transformative processes that can be achieved through the means of technocratic government-driven projects to ameliorate the vulnerability of pastoralists to climate risk and help them achieve livelihood security. Though the government rhetorically recognizes the contribution of pastoralism to livestock production and has identified it as a driving force for further economic growth, the end goal is to radically transform this same livelihood into a settled way of life. This vision of the Ethiopian state is based on an all-encompassing discourse around the arid environment and the people inhabiting it. One line of the government discourse is that with the increased frequency of drought pastoral livelihoods are uniquely vulnerable. In this context, there have been efforts to improve environmental conservation and build community resilience as a means to manage risk and secure livelihoods. This premise which is founded on the environmental degradation discourse is used as a justification by the state to put in place projects meant to make the degraded arid environment 'hospitable' and modernize and transform the pastoral way of life. These government interventions have altered the society-environment nexus at the local level, which in turn differentially influences the livelihood security and risk management practices pursued on the ground. By situating the political ecology of risk management and livelihood security at the centre of Karrayu-environment-state interactions, this study examines the influence of government interventions on the Karrayu pastoralists' livelihoods and the environment, on the one hand, and the Karrayu pastoralists' resistance and accommodation to government interventions and how these shape the environment, on the other. The main research question is: how have state interventions and the associated environmental transformations been experienced and acted upon by the local pastoral communities in the arid and semi-arid Metehara plains of Upper Awash Valley, Ethiopia? More specifically, the study answers the following questions:

A. What are the historical trajectories of insecurity that have influenced Karrayu pastoralists' risk management and livelihood practices?

An understanding of local level pastoralists' risk management and livelihood security has to be located within broader historical trajectories that have influenced the interactions of pastoralists with their environment over the years and thus within their current risk management and livelihood strategies. The understanding of present-day risk management and livelihood security practices of the pastoralists firmly rests on an understanding of historical trajectories of resource politics that have shaped and influenced the interactions of the pastoralists with their environment. In answering this research question, this study explores the broader structural contexts in which livelihood insecurity arises for the pastoralists. Accordingly, it locates Karrayu pastoralists in the specific politi-cal ecology context that has evolved over recent decades.

B. How do Karrayu pastoralists continually practise livestock-based livelihood and risk management activities in the face of socio-environmental transformation?

This second question addresses the persistence of livestock-based pastoral risk management and livelihood practices under transformed socio-environmental conditions. Of particular interest here is the way the Karrayu pastoralists use their ability/agency to continually reorganize their livelihood and risk management practices in response to the changes in natural, social and political conditions, by activating or reactivating routine practices and traditional mechanisms for handling vulnerability. By emphasizing in particular the camel-based livestock production activities of the pastoralists, it will be shown how the Karrayuu pastoralists actively seek to maintain their livestock-based livelihoods in difficult Socio-environmental contexts.

C. How do Karrayu pastoralists take up and develop agro-pastoral livelihoods and risk management practices in the face of socio-environmental transformation?

The third research question focuses on the shift towards agro-pastoral livelihoods and risk management practices that the Karrayu have taken up in the face of changes in land tenure arrangements. The study presents the new resource arrangements surrounding the practice of farming and agro-pastoralism as a response to opportunities and constraints that the Karrayu are experiencing. By focusing on new mechanisms for managing scarce resources, I explore the new risk management and livelihood practices centred on agro-pastoral and farming activities. This helps us to understand that pastoral people do not just routinely respond to changing circumstances but actively use their agency and take part in processes that transform their livelihood practices.

D. How does research on context-specific risk management and livelihood security practices enable us to better reframe the mainstream perspective on adaptation?

The last specific research question relates to the theoretical and conceptual relevance of a political ecology approach, and puts local level risk management and livelihood practices in a broader context by comparing the empirical findings of the study with the hegemonic international perspective of adaptation in climate change research. In this regard, this study emphasises the importance of locating pastoralists' risk management and livelihood security practices in the context of the resource base on which they depend, and showing how they are related to these resources and how they interact with the state.

To answer these research questions, I decided to follow analytically and methodologically the political ecology approach which gives emphasis to pastoralists' modes of relations with natural resources and the active agency of pastoralists in these relationships that shapes their risk management and livelihood practices.

1.5 ORGANIZATION OF THE BOOK

This book consists of an introduction and seven chapters. This introductory chapter sets out the research rationale and background, states the point of departure of the study in the form of research questions, and places the dissertation within its conceptual and disciplinary field. Chapter Two provides the theoretical and conceptual basis by situating risk management and livelihood practices at the intersection of pastoralists-environment-state interactions. This is done using a political ecology approach that emphasizes pastoralists' agency in the face of constraining and enabling conditions. By bringing structuration theory into a political ecology approach that emphasizes the role of actors in shaping resource access and institutions, this chapter situates the work in the field of social geography. Building on this, Chapter Three introduces the research methodology and reflections on the procedure and practice of participatory and qualitative research. This chapter explains the methods I developed to enable me address my research objectives. It outlines the progression of my research, data collection instruments and analysis, followed by some ethical considerations.

Chapter Four presents the historical trajectories of livelihood insecurity as experienced by the Karrayu pastoralists over the past five to six decades. By locating the trajectories of livelihood insecurity at the intersection of pastoralists-environment-state interactions in the semi-arid Metehara plains, it sheds light on how the state's idea of national development was the driving force in the transformation of the landscape which resulted in changes in pastoralists-environment relations. These externally engineered changes were the root cause behind the disruptions in pastoralists' social and institutional setups that were initially founded on the logic of dealing with and managing seasonally variable natural resources. These changes in relations between pastoralists and natural resources have also been influenced by outside forces such as immigration of other pastoral or agro-pastoral groups into the Metehara plain, population pressure on the limited resources, and degradation of pasture land, to mention the major ones. This chapter traces the complex sources of risk and livelihood insecurity that have surfaced in Upper Awash valley over the past six to seven decades.

Following this, Chapter Five focuses on the discontinuity and reorganization of risk management and livelihood practices of the Karrayuu community in the face of changes in the natural resource base and local pastoralists' traditional mechanisms of handling vulnerability. Furthermore, this chapter delves into the forms of livestock-based livelihood and risk management practices adopted by the Karrayuu in the face of societal and environmental transformations. The Karrayuu pastoralists have used their agency to reorganize themselves around camel-based livestock herding and access distant resources that have been relatively less affected by the transformation of the landscape in the Metehara plain. Accordingly, this chapter explores the routine forms and the reorganized forms of livestock-based risk management and livelihood practices pursued by the Karrayu pastoralists.

In Chapter Six, emphasis is given to the risk management and livelihood practices of farmers and agro-pastoralists. This chapter gives particular emphasis to the way Karrayuu households organize themselves around the practices of agro-pastoralism and how they access the necessary resources to continue these activities. It locates the practice of agro-pastoralism at the intersection of the government's strategy of transforming the Karrayu way of life, internal differentiations within Karrayu social organization, and the immigration of the Ittu and associated changes in land use. The main intention of this chapter is to show how the interactions between outside forces of transformation and the pastoralists' own active agency lead to agro-pastoralism as a new form of risk management and livelihood practice.

In Chapter Seven, I consider the hegemonic adaptation discourse, that gives primacy to environmental stimuli, in connection with the previous empirical chapters that focus on processes of social, political and environmental interactions in shaping risk management and livelihood practices in arid and semi-arid areas of Ethiopia. In this chapter I argue that understanding the broader contexts in which risk management and livelihood practices take place helps to show that adaptation to climate risk is embedded in specific pastoralists-environment-state relations that have shaped the modes of relations around resource utilization. In doing so, this chapter tackles the last specific research question.

Chapter Eight concludes this book. In this chapter I summarize the major findings and contributions of my research by revisiting the questions that I formulated at the beginning. I also point out some directions for future research in the area of human-environment interactions.