

**Transformative Adaptation and Natural Resource
Management Interventions in North Eastern Ethiopia**

Dissertation

Submitted to
obtain the Degree of Doctor (Dr. rer. nat.)
at the
Faculty of Mathematics and Natural Sciences
of the
Rheinische Friedrich-Wilhelms-University of Bonn

Submitted by
Million Getnet Gebreyes

Bonn 2016

Angefertigt mit Genehmigung der Mathematisch-Naturwissenschaftlichen
Fakultät der Rheinischen Friedrich-Wilhelms-Universität Bonn

1. Gutachter: Prof. Dr. Detlef Müller-Mahn

2. Gutachter: Prof. Dr. Sabine Tröger

Tag der Promotion: 25.10.2016

Erscheinungsjahr: 2017

Summary

This study is motivated by the observation that adaptation to climate change is often presented as a technical problem that requires only engineering and technological solutions. What is missing from current adaptation research is a nuanced understanding of how the state, society and nature interact in adaptation decisions and implementations. Such an understanding is important to unpack the black box of transformative adaptation, which is understood here as adaptation that involves profound systemic changes, which is inclusive of local voices and is based on learning from experiences, experimentation and collaboration among actors. Accordingly, the main research question of this study is “In which way does adaptation with climate risks require action coordination among local communities and the state?” The state and local community actors were chosen because of absence of other active actors on resource management in the study areas. This study uses two case studies of state led interventions in watershed development and irrigation management as a proxy for adaptation practice. Hence, the findings are based on critical realist oriented empirical research work conducted on these interventions in four villages, in the Gubalafto and Kobo Districts of North Wollo Administrative Zone, in Amhara Region, Ethiopia. The data collection methods included individual interviews and focus group discussions with local communities, expert interviews, analysis of official documents from different levels of government offices and field observations. The results of the study showed that for smallholder farmers, livelihood risks have multiple sources, having both material and discursive components. This study identified five risk settings, understood here as category of risk that is underlined by a variety of different factors, which were important for state and local community actors: naturalized risk setting, subsistence risk setting, market volatility risk setting, demographic risk setting and policy failure risk setting. It is important for adaptation interventions to understand the nature of these risk settings and the way their interaction produces livelihood risks. The research assessed the two case studies based on the aforementioned understanding of risk settings and risk perceptions among state and local community actors. The results showed that one could see adaptation action coordination between actors with power imbalance, in our case between the state and local communities, as a struggle between containment strategies of the state and counter-containment strategies of local communities. The state containment strategies included controlling mechanisms of the state to direct collaborative resource management arrangements towards its interest and prescriptions, whereas counter containment strategies included various methods by which local communities resisted the state’s containment strategies and pressured the state to consider their interests and experiences. The state hegemonic ideology dictates what is desirable in terms of both the outcome and process of adaptation. For example, in both case studies state actors at different levels take the government rural transformation program as a non-negotiable development agenda. Hence, state experts at different levels have religiously pushed technical recommendations from national guidelines for soil and water conservation and commercial irrigation agriculture, at times without questioning the local applicability of some of these recommendations. The state’s governmentality strategies bring the hegemonic ideologies to actual projects and programs, which allow them to plan, control and direct the actions of local communities. In both case study interventions, this included using constitutional and party related local organizations, extensive public consultation conferences, strict monitoring, feedback mechanisms, and local by-laws to punish non-compliance. Hence, containment strategies often combine ideological imposition, grouping people in different local organization and coercion in a coordinated manner. However, other actors, in this case local communities, are also not passive subjects of state’s containment strategies. Depending on the level of their social capital and political efficacy, they exert pressure on the state to either influence its action or resist it. Absenteeism during collaborative activities, vandalism on communal resources and outright opposition were some of the forms of resistance. Overall, the study

showed that the strong-handed state control over the resource management interventions led to large coverages in program implementations. However, some contest the usefulness of the interventions for adaptation with climate risks as people questioned how conservation gains from resource management interventions could translate into livelihood benefits. In other cases the state intervention actually created more livelihood risks for some farmers. The study also revealed that existing state containment strategies dominate spaces of interactions for decision making towards instrumental use where by the state uses decision-making platforms and processes to direct decisions in its favour, as demonstrated by the way it uses its political influence on two of the dimensions of social learning, deliberation and learning processes. Hence, although the heavy state control on the collaborative process enhanced the coverage of the resource management interventions, it blocked the possibility of developing genuine social capital among local community members and hampered opportunities for learning from past and present experiences in resource management. Therefore, the study concludes that adaptation action coordination, and by extension transformative adaptation, in Ethiopian context would require reforms in power relations between the state and local communities to enable inclusion of citizens concerns in adaptation programs and projects and foster learning from experiences and experimentations.

Dedication

To my son Yohannes Million

Acknowledgement

I would like to start my acknowledgment by thanking Professor Detlef Mueller-Mahn, my PhD supervisor. I owe you special thanks for the all rounded support throughout the study period. Your critical eyes on my study were invaluable in constructing my new identify in social sciences. I would also like to recognize the valuable contribution of my second supervisor, Prof. Sabine Troeger. Additionally, I would like to thank Bayreuth International Graduate School of African Studies for funding my PhD preparatory period as well as the entire fieldwork expenses. However, my main scholarship for my PhD came from the DAAD and I therefore deeply thank the DAAD as well as the German Government for their role in grating me this opportunity.

I would be remiss if I failed to mention my colleagues at the university of Bayreuth and University of Bonn who supported me throughout my study period. In particular, I would like to mention Dr. Jin-Tae Hwang and Theobald Theodory, for all the close friendship and academic engagement we had throughout my study period. My family and friends were also with me all the way throughout my study period. My special thanks go to my son, my mom, my sisters and my girlfriend. From the research field, my heartfelt thanks go to the many experts in Amahara region, North Wollo administrative zone, Gubalafto district and Kobo-Girana Development Program that made my work possible. To my respondents in Woynie, Aradom, Laste Gerado, and Addis Kign Villages, thank you so much. Not only did you provide me with the necessary data to write my dissertation, but you also taught me valuable lessons on various issues that I keep dear to my heart.

Acronyms

AMAREW	Amhara Micro-enterprise development, Agricultural Research, Extension and Watershed Management
ANRS	Amhara National Regional State
ARBA	Amhara Region Bureau of Agriculture
ATA	Agricultural Transformation Agency
AWWCE	Amhara Water Works Construction Enterprise
BFED	Bureau of Finance and Economic Development
CARS	Council of Amhara Regional State
CIDA	Canadian International Development Agency
CRGE	Climate Resilience and Green Economy
CSA	Central Statistical Agency
EEPCO	Ethiopian Electric Power Corporation
EPRDF	Ethiopian People Revolutionary Democratic Front
FDRE	Federal Democratic Republic of Ethiopia
FGD	Focus Group Discussion
GDAO	Gubalafto District Agricultural Office
GDP	Gross Domestic Product
GIZ	Gesellschaft für Internationale Zusammenarbeit
GTP	Growth and Transformation Plan
IIR	Individual Interview Respondent
IPCC	International Panel on Climate Change
KfW	Kreditanstalt für Wiederaufbau
KGVDP	Kobo Girana Valley Development Plan
KII	Key Informant Interview
MoA	Ministry of Agriculture
MOARD	Ministry of Agriculture and Rural Development
MOFED	Ministry of Finance and Economic Development
MOI	Ministry of Information
MOWR	Ministry of Water Resources
NA	Not Available
Ob	Observation
PASDEP	Plan for Accelerated and Sustainable Development to End Poverty
PIF	Policy and Investment Framework
PSNP	Productive Safety Net Program
SLM	Sustainable Land Management
SWC	Soil and Water Conservation
TPLF	Tigray People Liberation Front
TVET	Technical and Vocational Education Training
USD	United States Dollar
V	Village

Table of Contents

Summary	iii
Dedication	v
Acknowledgement.....	vi
Acronyms	vii
List of Figures	x
List of Tables.....	xi
Chapter One:Introduction.....	1
Chapter Two: Theoretical background of the study	8
2.1 Introduction.....	8
2.2 The notion of political ecology and its relevance for understanding adaptation.....	8
2.3 Production of climate risks.....	12
2.4 Tackling the de-politicization of adaptation practices	16
2.5 Towards transformative adaptation with climate change.....	21
2.6 Conceptual framework of the study	25
Chapter Three:Research Methodology.....	28
3.1 Introduction.....	28
3.2 The research approach and overall process.....	29
3.3 Background to the selection of the cases for the study	31
3.4 Selection of case study areas.....	36
3.5 Description of the study area.....	37
3.6 Sampling procedure and sample size	41
3.7 Methods of data collection	43
3.8 Data analysis and write up	48
Chapter Four: Understanding the Vulnerability Context of the Study Area	51
4.1 Introduction.....	51
4.2 Livelihood risks facing local communities in the study areas.....	52
4.3 Multiplicity of risk settings in the study villages	55
4.4 Various forms of risk production in the study areas	70
4.5 Managing climate risks	76
4.6 Interim Conclusion.....	81
Chapter Five: Adaptation Action Coordination: The case of watershed development	83
5.1 Introduction	83
5.2 Historicizing the resource management-adaptation nexus in Ethiopia	84
5.3 The status of watershed development interventions in Ethiopia	89

5.4 Forcing people or fostering cooperation? The politics of people mobilization for watershed development campaigns	94
5.4.1 Hegemony as a containment strategy of the state.....	94
5.4.2 Governmentality as containment strategy of the state.....	104
5.4.3 Resistance as a counter containment strategy of people.....	115
5.4.4 When the state and the people agree: Environmentality of the people.....	125
5.5 Implications for adaptation with climate risks	127
5.6 Interim conclusions	137
Chapter Six: Adaptation Action Coordination: The Case of Irrigation Management	138
6.1 Introduction	138
6.2 Institutional Structure of Kobo Girana Valley Development Plan.....	140
6.3 The need for action coordination for irrigation management.....	142
6.4 State’s containment strategies as action coordination mechanism.....	146
6.4.1 Action coordination through hegemony	146
6.4.2 Action coordination through governmentality	154
6.4.3 Counter containment strategies of irrigation users	164
6.5 Implications for adaptation with climate risks	167
6.6 Interim conclusion.....	176
Chapter Seven: Social Learning for adaptation action coordination	177
7.1 Introduction	177
7.2 Social learning as a theoretical concept to understand action coordination.....	178
7.3 Deliberation in the case study interventions	181
7.3.1 Spaces of interaction in the watershed development intervention.....	181
7.3.2 Spaces for interaction in the irrigation management intervention.....	201
7.4 Forms of learning	209
7.4.1 Passive learning from experience	211
7.4.2 Active learning from recent and current experiences	215
7.5 Outcomes of the social learning process: Is there room for transformation?.....	218
7.6 Interim conclusion.....	223
Chapter Eight: Conclusions.....	224
References	236
Annexes.....	251

List of Figures

Figure 1: Conceptual framework of the study, elements of transformative adaptation.....	27
Figure 2: Location map of the study areas	39
Figure 3: Field work activities.....	48
Figure 4: Partial views of the two study villages with rugged and degraded terrain.....	56
Figure 5: Observed global climate change trends	58
Figure 6: Naturalized risk settings.....	62
Figure 7: Subsistence risk setting	64
Figure 8: Demographic risk setting	66
Figure 9: Market volatility setting.....	67
Figure 10: Government policy failure risk setting	69
Figure 11: Traditional stone buds at Woyniye Village	77
Figure 12: Model farmers from Laste Gerado village.....	78
Figure 13: Natural resources managed by customary institutions.....	79
Figure 14: Rehabilitated hillside, Woyniye Village	128
Figure 15: Rehabilitated hillsides, Laste Gerado Village.....	128
Figure 16: Physical structures on farmlands, Woyniye Village	130
Figure 17: Physical structures on farmlands, Laste Gerado Village	131
Figure 18: Rainfall and GDP relations in Ethiopia (1982-2006).....	138
Figure 19: Location map of Kobo-Girana Valley	141
Figure 20: Water distribution technologies at plot level	144
Figure 21: The political environment of KGVDP.....	152
Figure 22: The structure of the governmentality mechanism.....	162
Figure 23: Overt and covert counter containment strategies of irrigation users.....	165
Figure 24: Increase in the number of beneficiaries of KGVDP irrigation intervention	169
Figure 25: Increase in area under cultivation under KGVDP irrigation intervention	169
Figure 26: Trend in annual revenue generated from sell of cash crops under KGVDP irrigation schemes	170
Figure 27: Chain of benefits of the irrigation management intervention	173
Figure 28: The role of social learning in action coordination in resource management	181
Figure 29:Space for action coordination based on social learning	211

List of Tables

Table 1: Summary of climate related risk settings in the four study villages.....	61
Table 2: Planned and performance of integrated natural resource management in Amhara Region, 2010-2013.....	90
Table 3: Planned and performance of integrated natural resource management in North Wollo Administrative Zone, 2010-2014.....	92
Table 4: Five years performance of natural resource development, Gubalafto DIstrict	93
Table 5: Overall growth of the KGVDP for 9 years period	168

Chapter One

Introduction

The international negotiations on climate change have taken adaptation¹ with climate risks from its marginal place in the 1990's to a centre stage from the early 2000's onward (IPCC 2012:404-408). This is accompanied by increased attention to adaptation research, although practice oriented understanding of adaptation is still at a formative stage (IPCC 2014b:8). With intensified social science research in the area, what is becoming clear is that adaptation is a multi-faceted concept comprised of multiple drivers of change, differentiated capacity among actors and asymmetric power relations (Taylor 2014; Forsyth 2003; Adger et al. 2001). This is even more the case in the context of developing countries where adaptation is linked to natural resource management by smallholder farmers (Niang et al. 2014:1226-1227). In this regard, Adger (2003:388) argued that society's capacity to adapt is a function of its ability to act collectively. However, collective action related to adaptation requires the development of social capital that allows coordination of action among the diverse set of actors involved (ibid). Hence, this research aims at understanding the interplay of agency and structural issues in framing drivers of change and moderating the power relations involved in coordinating adaptation action among actors with multiple interests, differentiated capacities and asymmetric power dynamics.

Early pioneers of climate change research were natural scientists. However, thanks to decades of research the scientific community has a far more nuanced understanding of its causes as well as its potential solutions. Hence climate change ceased to be a purely scientific issue and became an economic, social and political issue as well (Beck 2010). This paved the way for an increased role of social science in the climate change discourse in order to uncover the social construction of climate change by citizens in their everyday life (Ibid). In contemporary climate change discourse, effective climate action is argued to require climate science results to be translated into situated experiences and given meaning in the context of everyday life for a given society (Jasanoff 2010; Hulme and Mahony 2010; Oppenheimer 2005). As a result, the lived experiences of ordinary citizens, the interest and powers dynamics of nation states, the multiple layers of space conception, historical

¹ IPCC defined adaptation as “the process of adjustment to actual or expected climate and its effects.” It further states that “in human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects” (IPCC 2014b: 5)

implications and future climate projections for nation states with differing levels of economic development have become important dimensions of climate actions (Jasanoff 2010: 246-248).

The inclusion of values, meanings and contexts in the natural science dominated field of climate change opens up a space for understanding climate hazards from the perspective of vulnerability (O'Brien and Wolf 2010). Hence, people's vulnerability to climate change is assumed to be a result of their social, economic, political and ecological circumstances (O'Brien, et al. 2007). Accordingly, the research framework which will be developed at the end of this chapter considers multiple stressors and their interaction in its analysis (Turner et al. 2003b:8077; Birkmann 2012:58). This study used this as a point of departure to unpack the elements of transformational adaptation. Adaptation is transformational when it addresses causal vulnerability structures that put people's livelihoods at risk to climate and non-climate stresses (Bassett and Fogelman 2013; Marino and Ribot 2012). This study did this in three steps.

First, this study considers climate hazards as product of the interaction of climate and non-climate stresses and stressors. Adaptation research using the contextual vulnerability approach acknowledges the central role that socio-economic contexts play in transforming climate change perturbation and stresses into disasters (IPCC 2012). Adaptation research under this paradigm focuses on vulnerability reduction through addressing direct climate impacts and other underlining conditions that created the vulnerability context of the place of interest. It also focuses on understanding the differential impacts of climate change on different geographies and/or socio-economic groups. Adaptation researches also focuses on identifying governable actions that can reduce vulnerability (Adger et al. 2001:701). However, one notes that despite the thick volume of social science research on issues of vulnerability over the past years, the concept is not yet a finished research agenda. There are still issues which are often overlooked or not yet considered at all (Garschagen 2014). For instance, a vulnerability-based approach for adaptation research has been criticized for insisting on placing climate change at the centre of its analysis. Taylor (2014: xii) argued that such a research approach compounds how changes in meteorological parameters of climate interact with the socio-ecological parameters of a place to manifest its impact on people's livelihoods. Similar meteorological events happening in places with different socio-ecological conditions could create different impact. Hence, it is important to move away from an exclusive focus on the physical changes in the global climate and redirect our attention to a conception of climate hazards as products

of the interaction of meteorological changes and socio-ecological contexts of individual locations (Taylor 2014; Birkmann et al. 2013).

Second, this study elaborates people's agency and structural constraints/enablers in adaptation interventions vis-à-vis the issue of social vulnerability discussed in the previous paragraph. This is done by delving into the nature of the interactions between state and local community actors in the selected case studies. The argument here is that conventional approaches in adaptation research portrays adaptation as a technocratic solution (Bassett and Fogelman 2013; Tschakert and Dietrich 2010). Hence, technical solutions such as the construction of flood protection dikes, the development of drought resistant crop varieties, the use of sustainable land management techniques, irrigation and other technical solutions abound in adaptation literature (Smit and Skinner 2002). In the context of developing countries, the adaptation deficit is seen as financial and technical deficit which require a generous and sustained transfer of finance and technology to implement technical solutions which reduce vulnerability (Ayers and Dodman 2010; Adger et al. 2003). The source of such depoliticisation could be a result of either an overestimation of the role of science and technology to fix climate hazards, or a desire by decision makers to shy away from the political dimensions of the problem that exposes people to vulnerability (Arnall, Kothari, and Kelman 2014: 99).

Such a depoliticised perspective of vulnerability reduction and adaptation suffers from a lack of understanding and/or recognition of the political nature of interventions. Experiences in development interventions demonstrate that external interventions are inherently political and implementation challenges are as important as securing funding for intervention (Arnall, Kothari, and Kelman 2014: 99; Ferguson and Lohmann 1994:178). The situation is rendered more complex when one considers the fact that state bureaucracies will likely take the lead in adaptation interventions and action coordination needed between the state, local communities and other actors. Hence, a more nuanced understanding of the interplay of people's agency and structural constraints or enablers in adaptation implementation is essential (Taylor 2014; Adger 2003).

Third, this study focuses the discussion on transformative adaptation as social learning, a form of learning often associated with societal transformation (Pelling, O'Brien, and Matyas 2015; O'Brien 2012). Bassett and Fogelman (2013:50) stated that 'transformative adaptation emphasizes the importance of understanding the causal structure of vulnerability as the basis

of adaptation planning.’ One of the main arguments in this study is that the above understanding of production of climate hazard and state-society relations in adaptation intervention will allow for the identification of the elements of transformative adaptation. Another argument is that learning is a crucial element of transformative adaptation (Pelling 2011; Tschakert and Dietrich 2010). More specifically, social learning is considered to be an essential element of transformative adaptation as it consists of using of deliberation among state and community actors to build a mutual understating of problem situations and develop collective decision making mechanisms to address them (Collins and Ray Ison 2009a; Pahl-Wostl 2009). Hence, social learning based approaches for adaptation explore the spaces created to bring actors together, the facilitation of deliberative interaction among actors and the forms of learning that results from actors’ interaction (Pahl-Wostl et al. 2008; Pelling et al. 2008; Schusler, Decker, and Pfeffer 2003). However, in this research tradition, there is a tendency to depoliticize social learning process. This research would then contribute to a politicized view of social learning by contextualizing learning in the broader social vulnerability of people in a given place.

The basis of this study is an empirical research work conducted in Ethiopia. It used government led watershed development and irrigation management projects as proxy adaptation case studies. The selected cases have both theoretical and empirical relevance. Their theoretical relevance is derived from the fact that they display the intricate interaction of nature and society in climate change adaptation. Their management also involves a complex state-society relationship, with multifaceted social and political dimensions. Hence, they make a good case to develop theoretical understanding on adaptation coordination in practice. In terms of their empirical relevance, these interventions have been promoted in Ethiopia for close to half a century in order to deal with the slow onset of extreme weather events such as soil erosion, moisture stress and drought. The current Ethiopian government has also explicitly promoted these same interventions as adaptation projects. Hence, understanding the implementation processes of these conventional development interventions could give us an insight on the future of adaptation in the context of Ethiopia.

Accordingly, the overall research question of the study was “In which way does adaptation with² climate risks require action coordination among local communities and the state?” The

² The phrase “adaptation with” is used instead of “adaptation to” to emphasize the co-development of climate change and adaptation actions (Collins and Ray Ison 2009b).

state and local community actors³ were chosen for the analysis due to the absence of active involvement of the private sector, NGO or civil society actors in the selected study areas. However in order to refine the scope of the study, the main research question was subdivided into three specific targeted research questions which are as follows;

1. What social, economic, political and ecological sources of livelihood risks do state and community actors identify as important, and how do these sources interact to produce livelihood risks in the study areas?

Conventional climate vulnerability studies focus on actual or expected impacts of climate change parameters on different social categories. However, there is a tendency to put climate risks at the centre of the analysis, downplaying the presence of multiplicity of risks, which not only gives climate change an artificial centre stage but also obscures the way different hazards interact to produce risks on local livelihoods at individual, household and community level. Hence, by identifying a multiplicity of risk settings and risk perceptions by state and community actors, this research question aims at on understanding how livelihood risks are produced and situates climate risks within the broader context of social vulnerability of an area. This research question is addressed in chapter four.

2. In what ways are actions for adaptation coordinated among the state and local communities and how does this coordination influence the effectiveness of adaptation actions?

Interventions in natural resource management based adaptation require the collaboration of state and non-state actors for their successful implementation. This is contrary to the conventional understanding of adaptation in climate change literature whereby adaptation is portrayed as a technical solution in which success depends solely on the right mix of financial and technology transfer from the global north to the global south. This study aims to reposition climate change adaptation within the socio-ecological contexts that create people's vulnerabilities. This will be achieved by focusing on how the framing of climate hazards and

³ In this study, the "state" refers to a combination of the political leadership of the Ethiopian Revolutionary Democratic Front (EPRDF) with its multi-scale influence, which spans from the federal government up to village level governance and experts who are official office holders in different sector offices and function parallel to the political structure. A "local community" refers to rural residents under the lower administrative unit in Ethiopia, called Kebele. While local communities often share cultural and linguistic identities, they are also differentiated by gender, economic status, and religious and political affiliation.

the political interests of the state influence the way resource management is implemented as well as exploring the response of local communities to such interventions. Chapter five and six addressed this research question using two case studies.

3. How do power relations among actors influence the transformative potential of interactive platforms created for adaptation action coordination?

Most collaborative resource management literature reduces the problem of social learning for action coordination down to managerial challenges of creating spaces of interaction, facilitating the deliberation of learning and vague ideas of participation. By overlaying these managerial challenges onto the social and political dimensions of action coordination identified above, this research question aims to provide a politicized understanding of social learning. By doing so, this study also aims at enhancing the existing insight on transformational adaptation. Chapter seven addressed this research question.

The dissertation is organized into eight chapters. Chapter two gives a detailed account of the theoretical perspective used in the study. It outlines the current debates on climate change adaptation by mapping the conventional and critical approaches. It then briefly introduces perspectives in political ecology as well as the political dimensions of adaptation mainly in terms of collaborative natural resource based adaptation options. This is followed by introducing elements of social learning perspectives for adaptation and the rationale for this perspective.

The third chapter presents the methodology of the study. It is structured to provide the rationale for the choice of the case study interventions, the study sites, the sampling procedures for the selection of respondents, the data collection methods, the data analysis methods and the write up process.

The empirical chapters start with chapter four. The aim of this chapter is to set the scene for the subsequent chapters by conceptualizing how climate risks are produced through the interaction of biophysical and social processes. The central argument of this chapter is that climate risks are one of the multiple risks that local communities face and the source of vulnerability for local communities are both biophysical as well as social in nature. This

chapter also explores how different actors develop their own risk perceptions and the role that these perceptions play in how these actors frame adaptation practices.

Chapters five and six present the two case studies. Chapter 5 focuses on the integrated natural resource management program of the government of Ethiopia and chapter six focuses specifically on the Kobo Girana Valley Development Program, an irrigation development and management program active in the Amhara regional state, in north-eastern lowlands of Ethiopia. The central argument of both chapters is that the effectiveness of these adaptation practices is a function of the containment strategies of the state, the counter-containment strategies of local people and the level of convergence of these strategies.

Chapter seven take a critical look at the results of the previous chapters. The chapter uses empirical and theoretical approaches to investigate the transformative potential of the case study interventions. The central argument of chapter seven is that although deliberation and learning could transform livelihoods, the success of the interventions featured in the case studies was curtailed by the political and social contexts in the study areas.

Finally, chapter 8 ties together all the previous chapters for an overall conclusion and presents the implications of the study for the ongoing debates on climate change adaptation.

Chapter Two

Theoretical background of the study

2.1 Introduction

This chapter presents an overview of the theoretical perspectives of the study, which uses a variety of insights from political ecology, natural hazard research and natural resource management literature. The choice of these different perspectives will be justified by indicating their relevance for adaptation research and a meta-theoretical relationship will be established among the different theories and concepts used in relation to the research questions of the study. Accordingly, section 2.2 deals with the overall theoretical orientation of the study, which is political ecology. The section starts by giving an overview of what political ecology is and then proceeds to outline the relevance of political ecology to climate change adaptation research. Using the concept of riskscape, section 2.3 addresses the first research question by looking at the production of livelihood risks through interaction of a multiplicity of risks. Section 2.4 deals with the second research question by combining theoretical insights from state theories, political ecology, vulnerability and collaborative resource management. Section 2.5 deals with the third research question by looking at theoretical works on transformative adaptation, mainly from a social learning perspective. The final section provides the conceptual framework of the study.

2.2 The notion of political ecology and its relevance for understanding adaptation

Political ecology⁴ has different variants. In its classical form the researcher would start with an environmental problem at a certain place, then move down in scale to identify the drivers and root causes of the problem. The objective of such form of analysis was to argue against the dominant environmental orthodoxy of the time that portrayed peasant societies as the drivers, and victims of environmental degradation. Such a study would also expose the ill motives as well as the inability of state and market forces to deal with complex environmental problems (Robbins and Bishop 2008:748; Leach and Mearns 1996). The focus then moved on to investigations of the role of power in influencing human environmental interactions. The focus has traditionally been on how powerful actors claim the legitimacy to make

⁴ Political ecology is a research perspective with “the concern for ecology and a broadly defined political economy” (Blaikie and Brookfield 1987, cited in Peet, Robbins, and Watts 2011:24). Robbins (2012:84) argued that political ecology is neither a coherent theory nor a methodology, but it is an argument, representation or literature.

decisions over a certain environmental territory and how those affected use their individual and collective agency to resist external influences. In the process both the influence of politics on ecology and the role of ecology in politics are investigated (Bryant 1998).

Later studies of political ecology resisted the neo-Marxist approach to political ecology as it was seen as 'deterministic' in the way that the structural approach to political ecology was portraying local communities (Bryant 1998:82). Hence, the focus expanded into understanding the local politics of resource management. One way this is done is by narrowing down the analysis to a place based study whereby the differentiation of access to resources across different groups is examined. The analysis unearths not only the ecological causes of the differentiation but also the political processes that cause the marginalization of some to the benefit of others (Turner 2014:4).

Despite these developments, both the structural and the local focus of political ecology were criticized later for taking the environmental problem narratives that they were researching for granted. These criticisms prompted a post-structural turn for political ecology (Robbins and Bishop 2008: 748, 750). However, the turn to post-structuralism has been greeted with ambivalence by some political ecologists who feel that political ecology alienated itself from critical policy processes and confined itself within academia (Walker 2006:383). Some argue that it failed to provide a coherent alternative narrative to the policy making processes that it has been criticizing, and by extension it was argued that it failed to provide a better understanding of social and environmental problems (Robbins and Bishop 2008; Walker 2006:392).

Political ecology has been used as a useful way to unravel the social and political dimensions of climate change in a field dominated by science and technology. One notes that climate change is high on the international agenda. Recent associations of climate change with tropical cyclones (Knutson et al. 2010), the conflict in Syria (Gleick 2014), food security (Wheeler and Braun 2013) or mass migration (Black et al. 2011) are examples of how it is becoming ubiquitous. With its increasing publicity however, the politics associated with it seem to be relegated to the background (Swyngedouw 2010:214). In reality, climate change is political in two important ways. First of all, the scientific process of its knowledge production is not free from political influences, as political advocates can use the scientific evidence or uncertainties to further their interest and scientists can use their work to engage in

politics (Sarewitz 2004: 399). Second, as climate actions are driven by existing global power asymmetries, poor countries and communities could be forced to shoulder the burden of failed actions (Marino and Ribot 2012).

Climate science endeavours to create framing for a conception of a globalized atmosphere, establish the stabilization of climate as a central policy goal and institutionalize mitigation and adaptation actions (Hulme 2008). It portrays climate as a purely natural process which can be quantified and indexed. This approach involves a huge reduction of complexity, gap filling and uncertainty. The consequences of this science based understanding of climate change is demonstrated by the 'technocratic' solutions that it proposes (Adger et al. 2001:709). In the realm of adaptation, these solutions mainly include bio-physical measures which are assumed to directly tackle the specific climate risk that is identified (O'Brien, Eriksen, Siri, Nygaard, Lynn, and Schjolden 2007).

A recent IPCC report laments that most of the adaptation interventions in the past have been dominated by technology and engineering approaches (Noble et al. 2014:836). It asserts that even though advances in science are opening new opportunities, adaptation decisions require more context specific decision making processes (Jones et al. 2014). It also calls for a move away from the understanding of vulnerability as a purely biophysical phenomenon in favour of exploring more of the social ramifications of it. More importantly, it is now recognized that hazards are manifested where bio-physical environments and human systems meet (Noble et al. 2014). Such an understanding of vulnerability has led to a shift of focus from defining the adaptation gap in terms of climate impact and desired conditions towards defining it in terms of the underlying causes of vulnerability. This has led to the recognition of social and institutional adaptation actions that work parallel to engineering and technological solutions, albeit with the latter continuing to dominate (Noble et al. 2014: 863).

This study uses political ecology as an overarching theoretical orientation while relying on more specific theories for each of the three research questions. Representation, power and knowledge production are three areas of inquiry in political ecology identified by Peet, Robbins, and Watts (2011) that are used to tackle the three research objectives. The first line of inquiry looks at the representation of environmental problems to reveal the complex way that systems of discourses frame problem situations. This line of inquiry also looks at the role of hegemonic control that certain actors exercise over knowledge on environmental crises and

its implications in environmental management (Peet, Robbins, and Watts 2011:31). Robbins (2012: 95) argued that this involves exposing the approaches or perspectives that are taken for granted by unpacking the ways these perspectives ended up producing unintended outcomes. Such studies are helpful to locate the places of the root causes of undesirable, unsustainable and unjust socioecological conditions (ibid). This study uses this insight to frame the problem in the study areas. In the first case study, the historical narrative of land degradation in the area together with the discourse on the causes and consequences of it informed current and past soil and water conservation interventions in the area (cf. 3.3, 4.3, and 5.2). In the second case study, the combined narratives of aridity in the area, the hydrological resource potential and the national economic imagination on the role of irrigation for agricultural growth led to the current form of irrigation management in the study area (cf.3.3, 4.3 and 6.4.1).

The second line of inquiry is on power and governance. This inquiry looks at how power is exercised over nature and society in complex forms of social control, hegemony, ideology and governmentality (Peet, Robbins, and Watts 2011). Robbins (2012:87) called this ‘understanding persistent structure of winning and losing’. According to him, this involves tracking the winners and losers in environmental problems with special focus on the role of power in determining who the winners and who the losers are. This is done by developing chains of explanation from a place of an event to the national and international scales and then analysing the process of marginalization (ibid). This theoretical insight is used in in both case studies to analyse the way the state frames the problems of the areas and uses its influence to direct the interventions in these areas towards its own interest. However, it will also be shown that local people also influence state actions through various forms of resistance (cf. 5.4, 6.4). By so doing, this study shows the interplay of agency and structure in determining adaptation decisions at different scales (cf. 5.5, 6.5).

The third line of inquiry looks at the role of science in environmental decision making with a special focus on the political nature of knowledge production itself. It will also look at the conflict between knowledge held by government experts and knowledge held by local people (Peet, Robbins, and Watts 2011). On the one hand, political ecologists study environmental changes, the conditions that created these changes as well as the impacts of these changes. And on the other hand they also study the way power is used in creating and cementing a discursive notion of environmental change, its causes and its impacts (Robbins 2012: 97). This was observed in both case studies as the knowledge of experts’ displaced local

knowledge in key decisions. This reliance on government experts had consequences as the so-called ‘improved practices’ put forward by the state’s experts failed to deliver on their promises to local communities (cf. 5.5, 6.5).

Robbins (2012:94) added a fourth line of inquiry, namely human-non-human dialectics. This involves appreciating the role of the material characteristics of non-humans in influencing human struggles. Non-human nature can act as either a collaborator of the social, as it forms a dynamic actor network with the social to transform and be transformed by it, or an insurgent in view of the way non-human elements can limit the power and influence of human actors. The two case studies shows how the geographical landscape of the intervention areas and technologies used in the interventions enables or constrains certain control, resistance and cooperation dynamics that exist between the state and local communities (cf. 5.4.3, 5.4.4, 6.4.2, 6.4.3).

Using political ecology as an umbrella theoretical framing, this study aims at developing a notion of adaptation that involves power struggle among actors as they try to coordinate their action in order to manage livelihood risks imposed by climate and non-climate stressors. In order to show this, three sub-arguments have been developed using existing literature. First, this study argues that climate hazards are produced by the interaction of multiple and overlapping climate and non-climate risk settings and risk perceptions. Second, it is argued that risk management under these conditions requires action coordination among actors with asymmetrical power relation who would endeavour to take advantage of the coordination process to further their own interests. Third, it is argued that the transformational potential of existing action coordination mechanisms is a function of the ability of learning processes to build the social capital of actors and enhance their political efficacy. Each of these arguments and their theoretical base are presented below.

2.3 Production of climate risks

The aim of this study is to unpack the elements of transformative adaptation in a context where adaptation requires action coordination among multiple actors. Unpacking the elements of transformative adaptation requires a proper understanding of climate and non-climate risk settings and risk framings of actors involved in an adaptation action (Marino and Ribot 2012; Ribot 2011). To this end, rather than understanding climate change impacts as isolated incidents, this study argues that impacts are produced through the interaction of

climate and non-climate stressors at multiple scales. This is in line with various theoretical works in the field of political ecology on the co-production of nature and society. The co-production of nature and society has been embraced by political ecology through the Marxist conception of society-nature relations as an ensemble of historically and geographically specific ecologies (Ekers, Loftus, and Mann 2009:288). This is related to the Marxist concept of ‘historical materiality’ that asserts that human existence is linked with the productive transformation of nature whereby social relations determine the means of production, and are mediated by culture, ideology and politics. As a result, the natural environment is considered to be the product of the means of production in specific geographic areas (Peet and Michael Watts 1996:28). In this way society and nature co-produce each other (Ekers, Loftus, and Mann 2009; Mann 2009). Political ecologists use the concept of the co-production of nature and society to characterize the relationship between ‘natural hazards’ and society.

Hence, one of the contributions of political ecology to the study of adaptation is acting as a boundary concept between natural hazard and adaptation research (Smit and Wandel 2006: 284; Adger et al. 2003:186). In their seminal article, *Taking the naturalness out of the natural disasters*, published in *Nature*, O’Keefe, Westgate, and Wisner (1976) points out that natural disasters are not actually as natural as they appear to be. They first argue that the very definition of disaster requires the involvement of the human systems that are affected by it. Second, they argue that the extent of disasters is not evenly distributed geographically or economically. Rather, there are always certain geographical regions at a lower level of economic development that are hit harder by disasters. Hence, they argued, disasters are as much a result of social marginalization and vulnerability as they are a result of natural phenomena (ibid). Of course, a lot has changed since they wrote their seminal article. For example, climate change is more readily accepted as real danger compared to the “case not proven” (ibid: 566) status that they gave it. That being said, vulnerability is still a central explanatory variable in producing what we could call the social nature of climate change impacts. This has been well recognized by geographers, climate scientists and the IPCC (Füssel and Klein 2006; O’Brien et al. 2007; Cannon and Müller-Mahn 2010; Adger 2012; IPCC 2014a, 2012).

Accordingly, the political ecology oriented understanding of risk production takes vulnerability as its point of departure from more technocratic perspectives. Vulnerability here means a wide variety of exploitation, marginalization, exclusion and social stratification

which makes certain groups more prone to climate impacts than others (Ribot 2011). It emphasises the interaction of multiple risks to create a particular hazard (Turner et al. 2003a; Müller-Mahn and Everts 2013; Birkmann et al. 2013). Numerous case studies from around the world confirm this argument. For example, Aggarwal et al. (2010) indicated the importance of considering a multiplicity of risks, including climate, land based and socio-economic risks, facing sub-Saharan Africa and south Asia in order to ensure their security. Campbell, Barker, and McGregor (2011) also reported the plight of Jamaican smallholder farmers who had to deal with a combination of hazards including of hurricanes, droughts and bush fires. The implication of this multiplicity and overlap of risk settings is that it becomes challenging if not impossible to comprehend, calculate and control all the risks involved in a given situation (Müller-Mahn and Everts 2013; Eakin and Luers 2006).

Furthermore, while it is important to understand the multiplicity and overlap of risks, it is also essential to explore what causes them. The second important contribution of a vulnerability approach to climate change research is its potential in expanding our understanding of how social vulnerability is created out of the interactions of multiple hazards, both biophysical and social in nature. As mentioned in the previous section, the conventional approach to climate change and even to vulnerability is biased towards biophysical sources. However, the social turn in hazard studies (see for example, O'Keefe, Westgate, and Wisner (1976), Cutter (1996) and Wisner et al. (2004)), the entitlement literature on famine and food security (See for example Sen (1984) and (Watts and Bohle (1993)) and the political ecological works on land degradation (see for example Blaikie (1985)) made it clear that the term “natural disaster” is a misnomer, and that most disasters are heavily related to social factors, such as marginalization and surplus extraction. These works do not deny the bio-physical aspects of disasters; rather they are interested in how the bio-physical sources can interact with political and market mechanisms and create risky situations for certain segment of a population (Birkmann 2012). Such an approach will help us to better understand the possible impacts of climate change under certain political and market conditions at a place, and create a chain of explanation to trace the sources of vulnerability beyond that place, at the regional, state or even international levels.

Note that, hazards and their interaction are only one component of vulnerability. Some authors call hazards the external aspects of vulnerability, representing exposure of a system to hazards. On the other hand, internal components of vulnerability include the coping or

response capacity of a system (Bohle 2001). The internal component reflects the internal characteristics of the system along with its susceptibility or sensitivity to the various hazards it may face. This includes but is not limited to climate related hazards (Birkmann 2012; Turner et al. 2003a). Hence, a comprehensive assessment should identify both internal and external aspects of vulnerability.

However, vulnerability approaches cannot be taken for granted. Criticisms can stem from the notion of victimhood portrayed by the concept of vulnerability as well as the tendency to focus on indicators and measurements while overlooking the role of power in producing and defining vulnerability (Ribot 2011). This first criticism targets the fact that oftentimes, the concept of vulnerability portrays those affected as passive victims of environmental hazards. Vulnerability approaches are also criticized for being problem oriented rather than solution oriented (Ribot 2011; Adger 2006).

The criticism of vulnerability assessment frameworks for its lack of focus on the role of power in the production and definition of vulnerability is a serious one. Ribot (2011) noted that vulnerability assessment frameworks tend to be over occupied with developing indicators of vulnerability, with little attention paid to the underlying causes of vulnerability. There is also a tendency to downplay the importance of values when determining vulnerability (O'Brien and Wolf 2010). Different perceptions and values among actors can lead to different vulnerability framings and different sets of adaptation practices. This lacuna of existing vulnerability assessment frameworks could be filled by introducing the concept of riskscapes.

Borrowing from the concept of “scapes” as “pre-eminent instances of imagined worlds” from Arjun Appadurai, Müller-Mahn and Everts (2013:25), argue that “risk⁵ is always multiple. There is no one risk, but multiple risks entwined with other risks.” As a result, there is a possibility that different notions of risks that can apply to one place and therefore supply different conclusions. Hence, what is more important is an understanding of the landscapes of risks, riskscapes in plural with identification of the riskscapes that that have become meaningful to a larger group (ibid: 27). By looking at the dominant riskscapes and their overlap, we can trace and therefore better understand the practices that they induce (ibid). Hence, we can identify the role of power by identifying the riskscapes of different actors in a

⁵ Risk is defined by November (2008: 8) as “*a potential phenomenon, which has not yet occurred, but which we predict may develop into a harmful event (a crisis) affecting individuals or communities in one or more areas*” (Italics by the author)

social relation. The example of Müller-Mahn and Everts (2013) identified riskscapes of experts and local communities. In their risk management practices, these two groups define riskscapes differently, with risk settings that coincide as well contradict with each other.

This study uses this notion of riskscapes to study livelihood risks in the study areas (cf.4.2). Through qualitative data analysis, the different risk settings and their interaction are identified and the riskscapes of state experts at different levels and those of local communities are identified and discussed (cf. 4.3, 4.4, 5.5 and 6.6). This allows for a more accurate understanding of the implementation processes of the case study interventions as a two-way relationship between the adaptation practices and the two sets of riskscapes. While the riskscapes of both state and local community actors play a significant role during the implementation processes of the case study interventions, these interventions also created their own risk settings and influenced the development of the riskscapes of both experts and local communities (cf. 4.4, 4.5).

2.4 Tackling the de-politicization of adaptation practices

In the process of unpacking the elements of transformative adaptation, this study went further into analysing social and political processes of adaptation interventions. The argument is that the existing literature on adaptation to climate change takes an unproblematic view of adaptation. Two interrelated criticisms are worth mentioning here.

First, the concept of adaptation as adjustment to changes in environmental conditions connotes a deterministic view. Not to adapt is not an option and the victims are solely responsible for their own adaptation (O'Brien 2012). It also means that those who do not adapt would naturally be selected out. If not taken with care, this notion of adaptation ignores the fact that many people are forced to adapt to environmental changes which are not their own making (Ribot 2011).

Second, the concept of adaptation as adjustment to environmental changes also renders it as technological and engineering problem. After analysing over 500 pieces of scientific literature on adaptation, Bassett and Fogelman (2013) concluded that most of the adaptation literature treats adaptation as an adjustment whereby climate takes a centre stage and adaptation is considered as adjustment mainly using technology and engineering solutions. There is limited amount of research that investigates the transformative capacity of adaptation

actions. Hence, Bassett and Fogelman (2013:51) concluded that currently the concept of climate change adaptation is more of a *déjà vu* of the debates of the 1970's and 1980's on natural hazard rather than something new. By failing to address issues of inequality and power, the current use of adaptation fails to account for the political conditions that creates peoples vulnerability to climate risks (ibid).

Contrary to the dominant apolitical view, this study argues that climate change adaptation is a political concept. Taylor (2014) argued that the political dimensions of adaptation come from its role in setting priorities and determining the distribution of public and private resources. Accordingly, adaptation can assume several forms: resistance-based, incremental or transformative forms. While resistance-based adaptation is adaptation that is meant to withstand shocks, incremental adaptation is adaptation that is meant to accommodate changes within an existing structure. Transformative adaptation⁶ on the other hand is adaptation that is aimed at instigating system level change by restricting underlying structures and generative mechanisms (Pelling, O'Brien, and Matyas 2015:117; Marino and Ribot 2012). Transformative adaptation emphasizes the identification of the causal structure of vulnerability production on multiple scales as a condition for adaptation assessment and planning. It also emphasizes change in power relations is often necessary to respond to the adaptation needs of a socially and geographically differentiated society (Bassett and Fogelman 2013). This shifts the focus of analysing adaptation research from what counts as adaptation to who decides what adaptation should be and how they decide (O'Brien 2012). These questions are partly answered in the section above on risk framing, but they go beyond risk framing into understanding the role of power and power relations in the process of identifying possible solutions and implementing adaptation actions (Marino and Ribot 2012).

The importance of understanding the role of power in risk framing, identifying adaptation options and coordinating various actors to the same cause is nowhere more important than in resource-based adaptation. The importance of resource management for adaptation to climate change is well recognized in the recent IPCC report (Niang et al. 2014). This is especially true of developing countries where livelihoods are intricately linked with natural resources and their sustainable management (Tompkins and Adger 2004). The capacity of actors to recognize their interdependence and develop a working partnership to coordinate their

⁶ IPCC defined transformation as “a change in the fundamental attributes of a system including altered goals or values” (Burkett et al. 2014:181)

resource management actions is at the core of successful resource management. This is often discussed under the umbrella concept of co-managing natural resources (Tompkins and Adger 2004; Berkes, Armitage, and Doubleday 2007; Olsson, Folke, and Berkes 2004).

However, note that co-management does not often occur between actors of equal power. It often involves actors with asymmetric power dynamics, such as the state and local communities, requiring a complex interplay of different forms social capital (Adger 2003). This study uses literature in collaborative resource management that treats collaboration as a political struggle, as opposed to conventional approaches, which treats collaboration as a management challenge. This literature shows that when actors with asymmetric power dynamics engage in collaborative management, there is a tendency for the actors to compete for dominance over the process. Walker and Hurley (2004) analysed resource management efforts that were presented under the banner of collaborative natural resource management and involved the state and local communities. They argued that conventional research on collaborative resource management focuses on ‘institutional’ and ‘procedural’ aspects of the collaborative arrangement such as facilitation of collaboration, creation of discussion forums, controlling mechanisms and so on, without due attention to the political nature of these issues (Walker and Hurley 2004: 746). Unlike its promises, they argued, collaborative resource management would not result in a win-win solution especially when there are competing interests among the actors. Rather, the most powerful actors in the collaborative process would attempt to contain the actions of the less powerful actors in order to take advantage of the collaboration (Walker and Hurley 2004; Few 2001).

Containment is a process whereby powerful actors in collaborative arrangements use their power and discursive instruments to make sure that a certain pre-planned process is not hampered by competing actors (Few 2001:112). They legitimize their interest and delegitimize resistance by taking advantage of the collaborative management arrangement (Walker and Hurley 2004). State-society literature on resource management provides insights on how this process works. Bridge (2014) identified three patterns of engagement that are inspired by the works of James Scott, Michel Foucault and Antonio Gramsci. The works of James Scott look at how autocratic states use simplification and legitimization as mechanisms of managing natural resources in their attempt to alleviate environmental and social problems (Scott 1998). Either soft power such as enticement using conditional funding or hard power

such as coercion are used by state and other related actors to gain acceptance of their schemes (Li 2005).

The works inspired by Mitchel Foucault on the other hand move the focus from the nature of the state towards power and knowledge in creating governable spaces by the state (Bridge 2014). Knowledge production and rules are used to govern individuals and collectives whereby power is used to create discursive rationalities which are used to settle disputes. Technologies such as statistics and maps are used to make subjects knowable and governable (Rose-Redwood 2006).

Those who follow a Gramscian approach to state-nature relations focus on how the state uses its hegemony manifested principally through 'ideology' and 'common sense' and selective use of coercion and consent to a state-dominated resource management plans (Bridge 2014:4; Mann 2009). Hegemony provides an explanation of how sub-ordinate groups can be an accomplice to a system which works against their interest and beliefs (Mann 2009). Ideologies of the powerful, which are a result of cemented experiences and experimentations of a narrow group of actors, are portrayed as applying to a wider range of actors. This involves partly accommodating the needs and desires of other groups. In this way the dominant groups obtain consent and legitimacy for their programs even when they work against the interests of sub-ordinate groups (Lears 1985:571). However, such a project is never finished. The dominant groups often do not achieve full consent; they face resistance and revolt along the way. When this happen, the dominant group often resorts to coercion (Lears 1985:569, 570; Bates 1975). Such a hegemonic process involves a wide array of actors including, business people, teachers, religious leaders, and others who would work to their own subjugation, albeit un-consciously (Lears 1985:572; Bates 1975).

There is a tension between the governmentality and the hegemonic perspectives because of the general tension between the perspective of Michel Foucault and Marxist perspectives. Hence, some authors argue for a choice of one over the other and warn of the danger of combining the two perspectives (Mann 2009; Barnett 2005). Others, however, argue for combining the two. This study also subscribes to the latter view. The argument is that a mix of the neo-Marxist view of hegemony and the post-structuralist view of governmentality can improve our understanding of the nexus of political, economic and everyday practices when

looking at the relationship between the state, nature and society (Khan 2013; Ekers and Loftus 2008; Peet, Robbins, and Watts 2011).

However, those with less power are not simply passive victims. Even in coercive state-society relationships, less powerful groups have some ability to counter the containment imposed on them. James Scott addressed this in his book *Weapon of the Weak: Everyday form of Peasant Resistance* (Scott 1985). The concepts of hegemony and governmentality take into account the ability of those who are dominated and governed to shape the effect of the power imposed on them by the state. In the concept of hegemony, for example, using ideology to influence others relies on conceding to a certain extent to the demands and aspirations of those who are subjugated (Mann 2009). This is known as a “counter-containment action” by those actors subjected to containment strategies by the state. Counter-containment strategies could involve subtle resistance, disruptive action and/or open opposition to containment strategies (Few 2001:119).

Despite their immense contribution in the understanding of how powerful actors, mainly the state, works to influence its subjects, the concepts of hegemony and governmentality, or at least their use in empirical research, seems to focus only on the mechanisms of domination by the state and the mechanisms of resistance by local communities. They have little to say on how the state can use its influence to create a positive atmosphere for resource management or environmental protection for subjects. This is the point that Agrawal (2005) highlights in his work on community forest management in India. His point of departure was the concept of governmentality by Foucault. He extended Foucault’s conception of governmentality by examining how technologies of power and technologies of self are involved in the creation of a self-regulated environmental concern by subjects, which he called “environmentality”. While technologies of power includes the practices which powerful elites engage in to control the conduct of individuals, technologies of self includes the practices that individuals themselves engage in through thoughts or actions to transform themselves (Agrawal 2005:165).

He termed the process of creation of environmentality as “producing of subjects” (Agrawal 2005:163). It is termed as a “production” because it is the result of the state attempting to “govern at a distance” (Miller and Rose 2006:9), which Agrawal (2005:181) modified and called “intimate government”. For Agrawal, this is a form of government at a distance, not

through formal bureaucracies but rather through a mix of persuasion, intrigue, calculation and rhetoric that creates a joint interest with its subjects (Miller and Rose 2006). Agrawal uses the example of replacing the state forestry bureaucracy with community councils that operate under a specific regulatory framework but with the ability to engage in and influence the day today activities of forest control. In the process, the same village communities that had negative attitudes towards state forest control and did not see the importance of environmental protection are turned into responsible custodians of their environment. What was also important in his analysis was that not all subjects were able to develop a sense of environmentalism, and not all places were able to translate their environmental-friendly attitude into concrete action (Agrawal 2005; Robbins 2012: 216). The concept of environmentalism was criticized for not addressing to whose benefit the subjects assist the state in its exercise of government (Robbins 2012: 218).

In summary, this section proposes politicized view of adaptation to reveal its transformative potential. This is done by shifting the focus of attention from what adaptation is to who decides what adaptation is and how such decisions are made. Hence, asking whether watershed development and irrigation management could help local communities to adapt to climate change might not be a novel question as these technical solutions known to have the potential. However, asking questions such as who decides which of these technical interventions should be considered as an adaptation intervention, who decides the normative outcomes of these interventions, who decides criteria of success and failure of these interventions (cf. section 5.2 and 6.4) and how are these decisions communicated and implemented (cf. section 5.4 and 6.4), could yield to a new understanding of the future of adaptation practice in Ethiopia. Such insights could also help us to expand the theoretical debate on elements of transformative adaptation in general.

2.5 Towards transformative adaptation with climate change

The above discussions highlighted the social and political dimensions of adaptation. Section 2.3 argued not only that adaptation should be preceded by vulnerability assessment, but also that vulnerability assessment itself needs to be mindful of the material as well as discursive nature of risk framing, hence riskscape and their interaction were discussed. Section 2.4 highlighted the social and political dimensions of adaptation action coordination. The main argument of the section was that adaptation action coordination, especially resource based

adaptation must account for containment strategies of the state and counter containment strategies of local people. What is common in both sections is the role of structures, institutions, power and power relations in determining vulnerability and adaptation actions. Both sections stressed the need to look at climate change adaptation beyond its bio-physical and technological dimensions and consider the role of power and power relations in vulnerability framing and adaptation decision making processes in order to better understand its transformative potential.

This section argues that practical insights on how to make adaptation actions transformative can be drawn by focusing our attention to the learning dimensions of transformation. Adaptation as transformation involves the transformation of the values and identity of individuals, material and organizational technology, the production and labour components of livelihoods, popular and policy discourse, practices and routines in everyday behaviour of individuals, biotic and abiotic environment as well as regulatory and cultural institutions (Pelling, O'Brien, and Matyas 2015:119). Learning is central to such transformation. Learning from the past through reflection, learning through trial and error, as well as learning from individuals and groups could not only help society adjust to changing circumstances, but also transform its values and assumptions on the way it views the world and shapes its behavior (Nelson 2009:498, 499). Transformative learning includes the awareness of one's own assumptions as well as reflection, open mindedness and a capacity to accommodate multiple perspectives (O'Brien 2012:673).

Hence, this research looks at selected dimensions of transformative adaptation, namely the dimensions that focus on learning and local voices. Hanson (2012:1184) argued that transformation involves a means of moving actors towards a modified condition which in part is constructed by themselves. Marino and Ribot (2012:327) also argued that transformative adaptation partly involves supporting the authority of vulnerable populations and increasing their political representation. Revi et al. (2014) made similar arguments and stated that transformative adaptation requires a willingness from powerful intervening actors such as the state, to listen to the grievances of citizens and their organizations during adaptation and development decision making processes.

Accordingly, there is a growing body of literature on the role of learning in facilitating transformative adaptation (O'Brien 2012:.672, 673). Collins and Ison (2009) argued that

uncertainty with regard to the future, complexity and the presence of multiple stakeholders challenge conventional technology and market based approaches for adaptation, opening the space for social learning approaches. Social learning⁷ is said to challenge all the actors involved in a joint decision making process to reflect on their experiences and re-consider their perspectives, which adds a transformative element to the learning (McCrum et al. 2009:425).

The social learning approach for adaptation with climate risk frames climate change as a wicked problem. Wicked problems are defined by several characteristics including: the absence of a definitive problem formulation, the absence of an immediate and ultimate test of a solution, and the uniqueness of every wicked problem (Ison 2008; Rittel and Webber 1973). Wicked problems cannot be tackled by conventional planning process which assumes that problems are clearly definable and solutions that are readily findable (Rittel and Webber 1973). Rather, the two interrelated processes of deliberation and experimentation are often suggested that for solving such problems.

Deliberation is considered to arise in situations where there are no clear cut solutions for a problem at hand. The definition of problems is considered to be the result of constructed discourses and deliberations processes that are designed to help actors build mutual trust and understanding (Dryzek 2005; Burkhalter, Gastil, and Kelshaw 2002). Hence, social learning processes start when stakeholders recognize their interdependence and engage in collaborative efforts such as joint trust building, problem definition, fact finding, development of alternatives solutions, decision making and decision implementation. This process could be initiated either by actors themselves or facilitated by external intervention (Mostert et al. 2007) .

Social learning is also frequently associated with experimentation. Using experiential and reflective learning, actors engaged in co-management can collaboratively test and explore management strategies (Armitage et al. 2008). Such learning is important in adaptation interventions as the uncertainty and complexity associated with climate change calls for approaches that rely on continuous improvements based on learning from the strengths and

⁷ For the purposes of this study, social learning is defined as a process as well as an outcome whereby actors with multiple interests come together for interactive engagement in order to coordinate their actions to achieve a sustainable management of natural resources (Ray Ison, Röling, and Watson 2007; Mostert et al. 2007).

failures of past strategies. Such experimental approaches can also be used to test and compare alternative ways of dealing with climate change as well as build flexible and robust systems (Pahl-Wostl 2006; Armitage et al. 2008).

The outcomes of a social learning process include: the building of social capital (Adger 2003) and socio-political efficacy (Armitage et al. 2008) to coordinate adaptation actions. Social capital and socio-political efficacy can be used for either instrumental or transformative purposes depending on the existing mode of intervention. When social learning is used for an instrumental purpose, it is called single loop learning (Armitage et al. 2008; Argyris and Schön 1974). This is when social learning processes are task oriented and are used for ensuring the cooperation of local communities in interventions that are aimed at solving a particular problem and designed externally without significant input from the community. When social learning is used for transformative purposes, it is called double loop learning (Armitage et al. 2008; Argyris and Schön 1974). This is a situation whereby the interests, aspirations and capacities of a local community are able to significantly influence the direction of an intervention, and actors get the opportunity to reflect and revise their values as well as the goals that they want to achieve (Burkhalter, Gastil, and Kelshaw 2002; Armitage et al. 2008).

It is important to note the role of power in linking the concepts of social learning and transformation. On the one hand, power, politics and interests can impose a formidable challenge for transformation as they can limit the possibility of social learning (O'Brien 2012). This is often overlooked in social learning and other collaborative resource management approaches, which tend to reduce social learning and collaboration to managerial approaches of creating a space of interaction, facilitation and participation (Collins and Ray Ison 2009a; Few 2001). On the other hand, as discussed above, social learning could lead to transformational changes in power relations by opening up a space for deliberation (Hanson 2012; Daniels and Walker 1996).

In summary, social learning is linked to transformative adaptation because of its ability to allow both state and local communities to coordinate their action properly. Spaces created for deliberation can help them to develop a shared understanding of sources of vulnerability and possible solutions. Joint experiments, experience sharing and reflection can improve their ability to coordinate their adaptation actions with more efficiency. This study uses the

concept of social learning to understand the transformative potential of the case study interventions as well as their structural limitations. This was done by identifying spaces for deliberation and interaction (cf. section 7.3), different forms of learning in these spaces (cf. section 7.4) and outcomes in terms of their limits and potential for transformation (cf. section 7.5).

2.6 Conceptual framework of the study

This study aims to unpack the elements of transformative adaptation. The main research question is concerned with understanding the conditions in which adaptation requires action coordination among state and local community actors. The argument is that effective action coordination will lead to transformative adaptation. To this end, this study uses a three-stage process in order to unpack the elements of transformation adaptation. The first stage of the study looks at the way that the social vulnerabilities of the study areas are framed by local communities and state actors. The second stage of the study looks at the implementation processes of the two case study interventions in order to understand how the vulnerability framings were translated into an adaptation action. The focus here is on the role of power in adaptation decisions and the implementation of adaptation actions. In the third stage, the study looks at opportunities and challenges for transformative decision-making in the selected case study interventions. Each of these steps is explained in brief below.

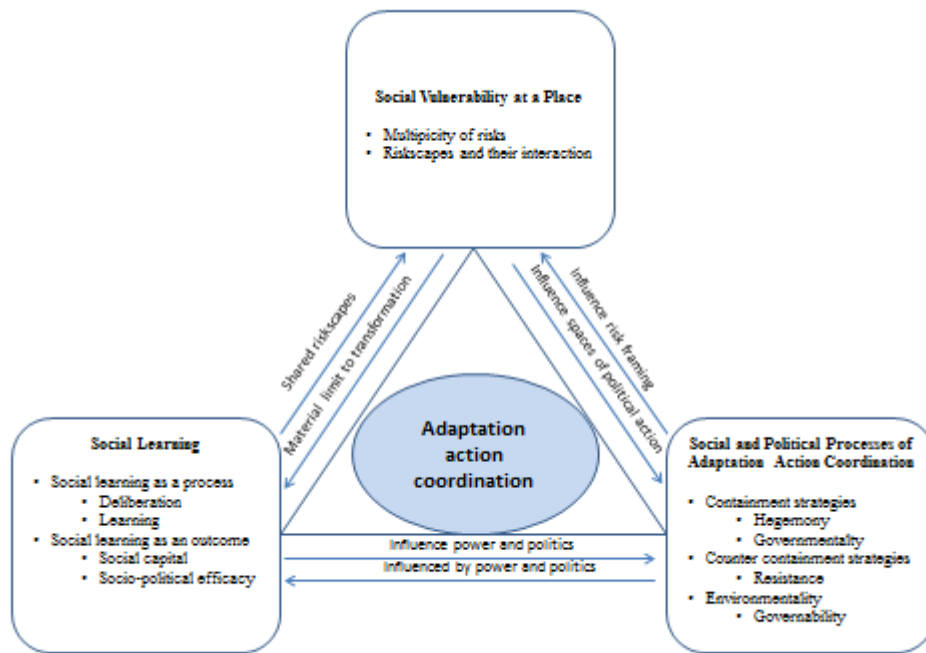
The first stage looks at the process of framing social vulnerability conditions in the study places (see Figure 1). A place here refers to where everyday life is happening with some rough boundary and in connection with other places. This study is concerned with people, their livelihood, and their natural resource base and factors that affect people's livelihoods in and outside of the particular place under study, including both material and discursive aspects. Understanding social vulnerability in a place involves identifying the core risks that people's livelihoods face in that particular place. There are often multiple livelihood risks. Hence, it is neither possible nor necessary to identify objective risks and their sources. Rather, what is important is to look at the discursive and material aspects of risks as seen by different actors at different scales. The outcome of such exercise is the identification of the risk settings and their interactions in a particular place. The risk settings, in principle, should be what adaptation interventions would target. In practice, however, interventions can also create their own risk. Hence, this study analyses the risk settings in the study areas and perceptions of

state experts and local communities in order to assess the effectiveness of the case study interventions.

The second stage looks into the process of adaptation action coordination in practice. The study uses interventions in watershed management and irrigation management that address climate risks in general, but are not labelled as adaptation interventions as such. The case studies reveal a collaborative process between the state and local communities for resource management geared towards livelihood improvement and climate risk management. It is argued in this study that the selected interventions would feature a power struggle between the state and community actors as both groups attempt to control the collaborative process, albeit with different capacities to influence major decisions. Hence, by closely observing the implementation process of the interventions together with the history and the broader socio-political context that shape the interventions, this study aims at revealing the complexity of adaptation action coordination.

The third stage looks into elements of transformative adaptation in the learning dimension of the case study interventions. The assumption is that supporting local views, interests and aspiration within the state led intervention could lead to more transformative changes. This involves creating spaces for deliberation, open and non-threatening deliberations, decision making based on deliberation, as well as learning from mutual experiments, mutual past experiences and collaborative activities (Pelling, O'Brien, and Matyas 2015; K. O'Brien 2012; Hanson 2012). These processes could build social capital of those involved in collaboration and increase their socio-political efficacy.

Note that the above three aspects are interrelated. For example, while existing power relations can influence risk framings, the material aspects of risk can also influence the possible political spaces of action. The material dimension of social vulnerabilities can also limit the possibility of transformation while transformative adaptation processes such as social learning can help to develop a shared understanding of social vulnerability conditions among actors. The same is true with social learning and existing power relations. While existing power relations can limit the extent of social learning, social learning can also open an opportunity to influence power and power relations.



(Source: Own sketch)

Figure 1: Conceptual framework of the study, elements of transformative adaptation

Chapter Three

Research Methodology

3.1 Introduction

This chapter presents the methodology of the study. The basic point of departure for the study is that a society's ability to adapt with climate risks depends in part on its ability to act collectively (Neil Adger 2003; Pendergraft 1998). Accordingly, the main research question of the study is: "In which way does adaptation with climate risks require action coordination among local communities and the state?" Addressing this question requires methodological innovations in many ways. First of all, defining climate risks and associated adaptation actions in developing countries like Ethiopia requires a historical perspective in order to analyse both the climate risks that have been threatening livelihoods and the responses to these climate risks by the state and local communities. As a result, it was necessary to find a way of identifying relevant cases that could answer the research questions. Second, the nature of the research question has social and political dimensions. This requires a methodological approach to studying local communities, the state as well as the the interaction between the two. Third, in connection with the above two, although the study concerned itself with local level processes, these processes are necessarily connected to higher levels of governance. What this means is that, the methodology chosen should enable the study to capture multi-scalar issues in the research questions.

Accordingly, this chapter is organized into seven sections. Section 3.2 deals with the research approach and overall process. Section 3.3 describes the background that led to the selection of the cases for the study. Section 3.4 describes the process undertaken to select the case study areas. Section 3.5 provides brief descriptions of the study areas. Section 3.6 explains the sampling procedure used to select sample respondents. Section 3.7 provides the data collection methods and finally, section 3.8 deals with the data analysis and the write up stages of the research process.

3.2 The research approach and overall process

This study uses a critical realist oriented research approach. It is argued that critical realism oriented social science research can be useful in grounding the natural science dominated field of global environmental change in an understanding sensitive of social realities and capable of transforming society for the better (Bhaskar 2010; Forsyth 2001). Critical realism strikes a middle ground between scientific objectivism and relativism. The core argument of critical realism is that the real world exists independent of a particular observer (Sayer 1992). The relevance of critical realism for climate change research lies in its ability to look beyond particular climate events, be they extreme or slow onset events. This is in line with long-standing traditions in social science to the study of environmental changes (Forsyth 2008). Whereas in empiricism there is a strict adherence to the objectivity of the notion of truth, critical realism adheres to the notion of the practical adequacy of knowledge, meaning that truth is understood as “the extent to which it generates expectations about the world and about results of our actions which are realized” (Sayer 2000:43).

In regards to a critical realist research process, Sayer (1992) suggested a two way iterative process between the abstract and the concrete. The research starts with a preliminary conceptualization of objects, called abstraction. After exhausting diverse sets of abstractions, they should be combined to develop the concrete object. Abstraction is the basic form of structural analysis. It involves an examination of the nature of relations and structures. Structures are sets of internally related objects or practices. Relations among objects can be contingent, meaning that either object can exist without the other or necessary, meaning object's existence is dependent on its relations to the other object (ibid). Such structural analysis should be accompanied by an analysis of the actions of actors within the structural arrangement. Analysis of causality requires a further analysis of generative mechanisms, which is the power and liabilities of objects or relations under investigation. Hence, events are a result of “retroduction” or mechanisms capable of producing them under a contingent condition (Sayer 1992:72).

When operationalizing the critical realist oriented approach for this study, the research went through a number of abstract-concrete phases. It started with a rough conceptualization of society-climate risks interaction and collective action as a core response to climate risks. The initial abstraction was that climate risks are among the core risks facing the livelihoods of

local communities. The researcher went with the abstraction of the conditions under which collective actions are necessary and possible. Using studies in natural resource management as analogy (Yeung 1997), the study postulated that collective action for adaptation can be achieved by creating social learning platforms for local communities to deliberate on common problems and devise collective actions. The core argument in the social learning approach is the possibility of creating social platforms in which local communities and other actors such as government experts would have the opportunity to defend their interest and deliberate on necessary compromises for their common advantage (Keen, Brown, and Dyball 2005; Leeuwis, Pyburn, and Boon 2002).

The initial abstraction, however, was challenged during the first three months of empirical field research in Ethiopia, conducted from June-August, 2013. While Moving across Amhara Region of Ethiopia speaking with local experts and visiting resource management interventions in different villages, the researcher realized that climate risks are only one aspect of livelihood risks facing farmers. It also became clear that ensuring collective action among actors was more complex than the initial abstraction. Despite the seemingly obvious threat of climate risks and land degradation, collective actions in dealing with these problems were weak, paradoxically even when people seemed to hold positive attitude towards the need for collaboration. The researcher noticed the heavy involvement of the state in rural development interventions in general and natural resource management interventions in particular, together with an overt and covert resistance of people against the state interventions.

The researcher then returned from the field and spent four of months analysing the field data and re-engaging with social learning and adaptation literature. The objective of this process was to refine the existing questions and reframe of the main research question along with the sub-question to reflect the role of the state. This was done in another phase of abstraction, now with more entities and manifold relationships among them. The overall organization of the selected cases, that is, the watershed development and small irrigation interventions, were identified at this stage. This included identifying the different actors such as the state, the citizenry and social organizations as well as analysing the power relations among the actors. This phase concluded with another phase of abstraction, whereby it was postulated that action coordination for adaptation with to climate risks could be a function of the effectiveness of

co-management arrangements of natural resource management between the state and local communities (Agrawal 2010).

The researcher undertook a second round of fieldwork for six months from January-June, 2014. The empirical work in the second round of fieldwork expanded the abstraction both vertically and horizontally. Horizontally, at local level, different livelihood risks that farmers were facing along with the forms of interactions these risks had with climate risks were identified. More entities were also added into the analysis, including various forms of social organizations, the differentiated landscapes on which people depend for their livelihoods as well as expert and political representatives of the state. Vertically, the relationship between climate and non-climate risks at the study places as well as higher-level processes at the district and regional levels were explored. The structural arrangements of the watershed development and small-scale irrigation interventions built in to the broader development interventions of the Ethiopian government were also analysed. This included identifying the power and liabilities of the entities within the structures.

The final abstraction involved tying the different pieces of abstraction together to draw a comprehensive picture of how climate risks were framed along with the many other stresses of social vulnerability of the study places. It also involved analysing the structures and generating mechanisms involving hegemony, governmentality, coercion, as well as the resistance of entities in the state and citizenry domain involved in mobilizing local communities for collective action for adaptation with climate risks. This was done through an iterative process of going between the abstract and the concrete, which includes theories on state, political ecology, resource management, adaptation and social learning as well as empirical materials.

3.3 Background to the selection of the cases for the study

Agriculture is the backbone of Ethiopian economy. The livelihood of close to 90 million people in the country depends on agriculture in one way or another way. This is evident based on the fact that the agriculture sector accounts for 43% of the national GDP, employing almost 80% of the labour force and contributing 9 of the ten major export commodities (FDRE 2015). It has the triple responsibility of securing livelihoods for millions of

smallholder farmers, serving as an engine for national economic growth, and ensuring the sustainable use of natural resources.

One of the critical limits of the agricultural sector in Ethiopia has been climate related risks, namely drought and soil erosion (FDRE, 2015). Narrowing down our analysis to recent periods, the policy direction in the national agricultural development over the last 20 years has been focused on responding to the threats posed by climate risks. This is based on recognizing the intricate relationship between agricultural development, natural resources and climate risks (FDRE 2015). In the recently released national strategy for climate resilience in agriculture and forestry it is stated;

“Ethiopia’s food crops and livestock upon which the livelihoods of millions depend are underpinned by its natural resources-land, water and forests. In the face of growing climate change threats, such as temperature rise, frequent drought and flooding, Ethiopia is working to address vulnerability and food insecurity as a development priority” (FDRE 2015:2).

When looking at major policy documents in the agricultural sector, one can clearly see that climate risks take centre stage in major policy interventions. In the discussions to follow, the evolution of the climate risks and climate risk management interventions in the policy documents of the agricultural sector over the last 20 years will be examined. The aim is to show that climate risks take centre stage in these policy documents and that natural resource management, mainly watershed development and irrigation have been the a major part of the climate risk management strategy by the Ethiopian state. These points will be further developed in the subsequent chapters, hence the aim here is to provide a justification for the choice of natural resource based adaptations, mainly watershed development and irrigation management, as the case studies to understand climate change adaptation in the context of Ethiopia. In the conclusion part of this section, this is linked with the broader debate in climate change adaptation in the agricultural sector and developing countries in general. In this way, the theoretical relevance of the chosen cases for the study will be justified.

To start with, the Rural Development Policies, Strategies and Instruments document (MoI 2001) states that the policy document assigns itself to addresses vulnerability reduction and development challenges of the country. This document has been the guiding policy framework for agriculture and rural development in Ethiopia for the last fifteen years. The document divides the country into moisture stressed low potential areas and wet high potential

areas. The main drivers of poverty and vulnerability in moisture stress and low potential areas, the document states, are inadequate rainfall, variability, drought and the degradation of natural resources such as soil erosion and deforestation. It states;

“In many places, sloped lands that should not be cultivated are cultivated; forests are slashed. If agricultural productivity on arable lands is made to improve significantly, the people would not have been involved in cultivating sloppy lands and slashing the forest. It is poverty and backwardness which lead the people to an inappropriate use of land. The farmers would have preferred to protect sloppy lands and forests rather than misusing and slashing them had a system been setup to make sloppy lands and forests be sources of income to the farmers through proper use” (MoI 2001).

Going forward, the document states that what is needed is to mobilize the rural communities to better manage their land and labour for improved agricultural production and livelihood. This, the document states, can be achieved through a continuation of the ongoing natural resource protection activity as well as utilizing the irrigation potential of the nation’s water resource base. It identifies the central importance of creating a common understanding of the problem among rural communities using deliberative processes and leadership from the state. It states;

‘The desired development could be brought about only when farmers participate by improving agricultural production on their farm. However, this requires cooperation among farmers to mobilize their labour and resource for the common good. This is so valuable that government intervention could not replace it. What the government could do with its limited financial capacity is to support farmers initiatives through leadership and mobilization’ (MoI 2001).

These narratives of the problem and the strategies prescribed to overcome the challenges of reducing vulnerability and stimulating economic growth informed subsequent development planning efforts in the country. The Ethiopia Interim Poverty Reduction Strategy Paper 2000/01- 2002/03 (World Bank 2001b) identified climate change, mainly the frequent incidence of drought as an important driver of vulnerability in Ethiopia. The document stressed the importance of continuing the environmental protection work that was in progress, acknowledging that the results were not insignificant thus far. It also states “the concept of linking relief with development has been applied since the late 1980s. Various activities of environmental protection such as soil and water conservation, terracing and afforestation

carried out over the years have shown positive results, and will be improved and continued in the future” (World Bank 2001a).

The Agricultural Policies, Programs and Targets for a Plan for Accelerated and Sustainable Development to End Poverty (PASDEP) 2005/6 - 2009/10 document (MoARD 2006) also continued with similar lines of argument, where the government led plans to reduce production failed due to rainfall variability and encouraging nonfarm related income generating activities. The main interventions identified include: soil and water conservation, rehabilitation and use of natural resources, livestock resources development, small-scale irrigation and water harvesting.

The Growth and Transformation Plan (GTP) 2010/11-2014/15 (MoFED 2010) and Ethiopia's Agricultural Sector Policy and Investment Framework (PIF) 2010-2020 (MoARD 2010b) are more explicit about climate change. The following are quotations from the PIF and GTP respectively;

“Whilst most of the anticipated climate change is still in the future and there are uncertainties about the nature and extent of change in the different agro-climatic zones of the country, there are indications that the drier areas may become even hotter and more arid; and, over large parts of the country, the frequency of extreme events, including droughts, may increase. This calls for the development of more robust and resilient farming systems that are able to adapt to a range of possible climate change outcomes as they unfold over the life of the PIF and beyond.”- (MoARD 2010b)

“Ethiopia’s contribution to the increased concentration of greenhouse gases in the atmosphere is negligible. But it is highly sensitive to climate change and variability. Ethiopia has large arid and semi-arid areas as well as development sectors which have already suffered much from the vagaries of climatic variations and are likely to suffer seriously due to the occurrence of a shift in climate. Thus, the adverse impact of climate change in general setback the development already gained.”- (MoFED 2010)

Both documents outline broad strategies of both adaptation and mitigation. The GTP document says that the strategic direction of Ethiopia will be to build an economy that is carbon neutral and resilient to climate fluctuations. To this end, developing policies, strategies, laws, and standards were the implementation strategies created for the GTP period.

In line with the previous planning periods, natural resource management activities such as small-scale irrigation, watershed development and afforestation were among the planned activities. This planning period also witnessed the development of two documents, one on green economy and another on resilient agriculture. In both documents, ongoing natural resource management interventions are linked with both mitigation and adaptation actions (MoFED 2010).

Finally, Ethiopian Government document released in 2015: *Ethiopia's Climate Resilient Green Economy: Climate Resilience Strategy, Agriculture and Forestry*, is the major climate change focused policy document designed both to outline the nation's plan for economic development and also to attract international climate finance. The release of the strategy document coincided with Ethiopia undertaking the second growth and transformation plan for the next five years, which puts the mainstreaming of climate change adaptation and mitigation issues into the national development planning processes. The document states that the Ethiopian economy has been subjected to the negative effects of current weather variability and there has been evidence of climate change for the last 50 years. It estimated that drought currently costs Ethiopia 1-4% of its GDP, and that future impacts are expected to raise that figure to 10% (FDRE 2015).

Hence, the strategy document envisages tackling both current and future climate changes. What is more interesting is that the climate risk management strategies developed are not new, but are in fact, conventional interventions. For example, the document states that out of the 41 options it recommends, 38 of them have already been under implementation with the Ministry of Agriculture federal programs. It also states that currently 60% of the federal budget and 80% of national resilience spending goes to addressing climate related vulnerability. Some of the specific recommendations in the document are farm crop and water management solutions such as irrigation and sustainable agricultural as well as land management measures such as soil and water conservation, among others (FDRE 2015).

In parallel with the increasing penetration of climate change and adaptation framings into recent development planning and interventions in Ethiopia, two critical issues are being raised. First, as Weisser et al. (2014) suggested, that there is a tendency of the state as well as other actors to adapt to the discourse of the current adaptation paradigm rather than to the changing climate itself. This is reflected in the increasing re-labelling of conventional

development interventions as climate change adaptation. A typical example can be found with soil and water conservation or small scale irrigation interventions. These programs started in the 1980's as a famine response are now being re-labelled as environmental degradation abatements and climate change adaptation interventions. Second, as argued by Leulseged, Nicol, and Srinivasan (2013), the state started using climate change adaptation to 'naturalize' vulnerability in order to shy away from issues which could transform the economy. They argued that the state uses a heavy hand to impose its development agenda, including climate change mitigation and adaptation issues. Hence, adaptation in this context has a technical, political and social dimension (ibid).

In this study two of the technical recommendations: soil and water conservation and irrigation management, are considered cases that can elucidate the social and political dimensions of climate change adaptation. As shown in the previous discussions, these interventions are at the core national adaptation strategies in the agriculture sector. These cases also relate well to the core theoretical question: In what ways does adaptation become a collective action problem and what are the political and social dimensions of mobilizing local communities for collective action on adaptation.

In summary, the above analysis of the past and current policy documents reveals several insights. First, climate related risks tend to take centre stage, along with issues of land and resource degradation. Recent trends, as shown in the GTP and PIF, indicate that climate change will take more central position in the nation's development policy. Second, there is continuity from previous resource management interventions in the urge to initiate more natural resource management works, such as small scale irrigation, watershed development, and afforestation. Third, the state maintains an important role in the overall development planning of the country that includes addressing vulnerability to climate risks.

3.4 Selection of case study areas

Once the cases for the study were selected, the next decision was on selection of case study areas. The decision was made based on four criteria: the existence of the required cases in the study area, the language of the study area, the familiarity of the researcher with the study area and manageability within the time and budget limits of the study. The researcher chose to work in Amhara regional state because of the language advantage that he has over other regions. Several experts were consulted including regional level experts and a researcher at

Addis Ababa University with extensive experience on climate change adaptation in the region. The outcome of these consultations indicated that the north-eastern part of the region, the area around Wollo would be a suitable case study area.

The area, especially North Wollo administrative zone has two interrelated characteristics, which makes it a good case study area. First, the area is one of the hotspots for climate related disasters such as drought and soil erosion. The notorious famines of the mid 1970's and 80's were more serious in this area than elsewhere in the country. The area is also associated with a high degree of land degradation due to soil erosion and deforestation. As a result, the area has been one of the hotspots for food insecurity. Secondly As a result of this, there has also been an extensive natural resource management intervention in the area. Especially after the 1984 famine, donors and the state undertook large scale soil and water conservation interventions as well as small scale irrigation interventions in Wollo and Tigray areas (Admassie 2000).

The specific study areas, the four villages in Gubalafto district and *Kobo* districts were chosen after consulting with North Wollo administrative zone agricultural experts. Gubalafto district was chosen for the soil and water conservation case because the zonal experts identified it as one of the districts that underwent a large amount of soil and water conservation programs, with cases of both success and failure. *Kobo* district was chosen because of the presence of the Kobo-Girana Valley Development Program, one of the pioneer modern small-scale irrigation schemes in the Amhara Region. In both districts, the interventions, namely the watershed development program and the irrigation management were responses to the recurrent moisture stress in the area. Both interventions require the mobilization of local communities for their common interest. They both also require the government to play a central role in mobilizing local communities for resource management.

3.5 Description of the study area

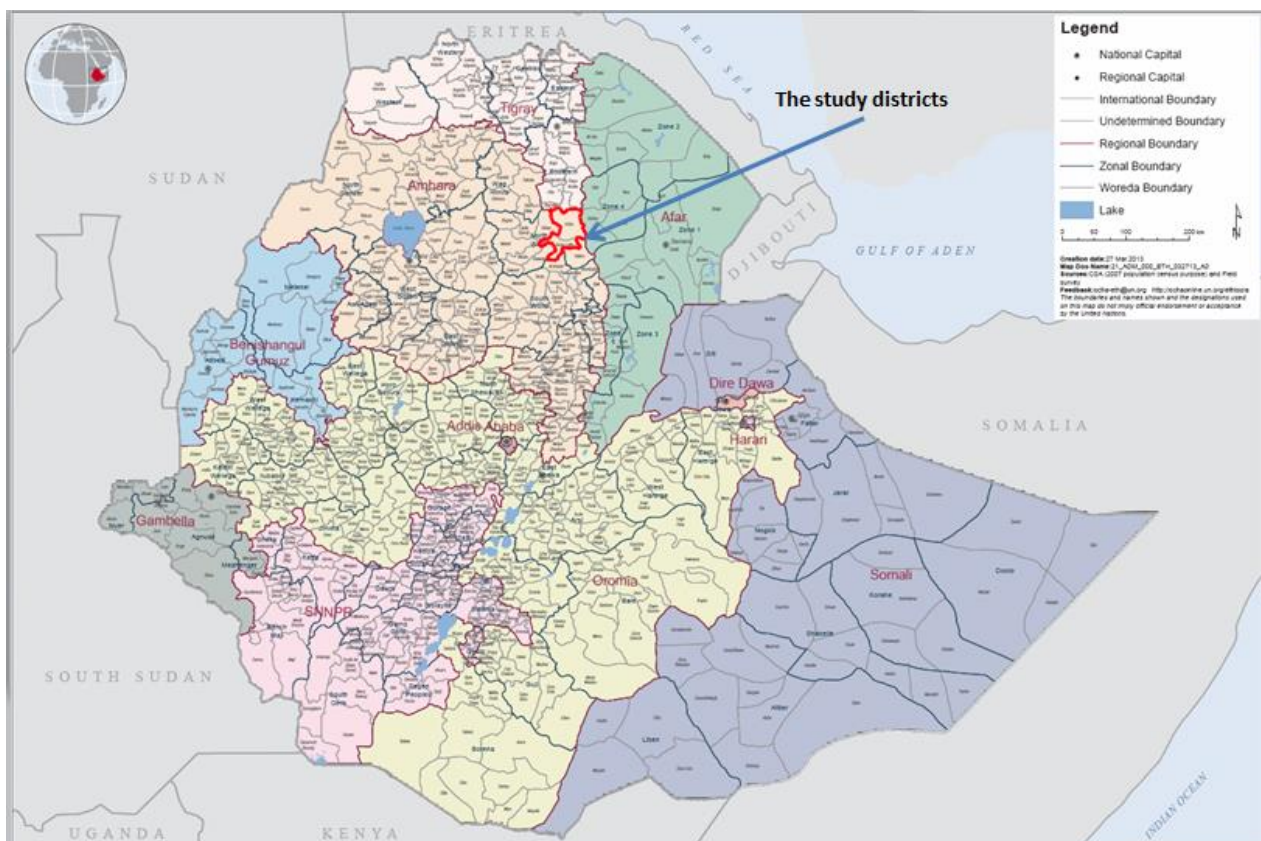
The Amhara national regional State extends from 9° to 13° 45' N and 36° to 40° 30'E. The regional state is made up of 11 administrative zones, 113 districts and 3,216 villages. The total population of the region is 17221976, out of which 8641580 are male and 8580396 are female (CSA 2007). The region covers approximately 161,828.4 Sq.km in area, accounting for 11 % of Ethiopia's total area. The region has three major geographical zones namely: the

highlands (above 2,300 metres above sea level), the semi-highlands (1,500 to 2,300 metres above sea level) and the lowlands (below 1,500 metres above sea level) accounting for 20 %, 44 %, and 28 % of the regional body respectively. The altitude of the region ranges from 500masl to 4,620masl. Rainfall in the region mainly comes from June to September when the intertropical convergence zone is located to the north of the country. The western parts and the highlands that are situated in the direct path of the moist winds receive over 1200mm of rain annually. The mean annual rainfall over the whole region varies from 300mm in the east to well over 2,000mm in the west. The amount of rainfall and the length of the rainy season decreases north and north-eastwards from the south-western corner of the region (BFED 2011).

The study was conducted in Gubalafto and Kobo districts, which are two districts in the Amhara region. Gubalafto lies between 11° 36' and 11° 58' North latitude and 39° 12' to 39° 50' East longitude (Gesese and Mberengwa 2012). According to data obtained from the district agriculture office, the total area of the district is about 130,000 ha, out of which 34.1% is cultivable land, 17.9% is grazing land, 27.1% is forest and bushland, 9.9% makes up human settlement, 6% is wetland and water bodies and 5% is degraded land. The 2007 population census shows that the district has a total population of 139,825, out of which 70,750 are male and 69,075 are female. More than 95% of the population live in rural areas (CSA 2007). The district has three agro-ecological zones, 17% lowland (*Kolla*), 46% mid-altitude (*Weynadega*), and 37% highland (*Dega*). In terms of rainfall, the highlands areas receive an average annual rainfall of 2500 mm, the midlands 1500-2500 mm and the lowlands 500-1500 mm (Gesese and Mberengwa 2012). The district has a bimodal rainfall pattern with two rainy seasons. The first season – “*belg*” (spring) starts in March and lasts until May, while the second – “*mahar*” (summer) lasts from July until September. The major crops cultivated in the study area include teff, barley, sorghum, bean, chickpeas, lentil, maize, onions and garlic. The production system is mainly mixed agriculture including crop and livestock farming. The area is known to be one of the most drought prone areas in the region (Tesfaye 2013).

Kobo District has a total population of 221,958 out of which 111,605 are male and 110,353 are female. Over 85% of the population lives in rural areas (CSA 2007). The District has a total area of 1,922,300 ha found in the Kobo valley. The lowlands of the valley are characterized by fertile alluvial soils and erratic rainfall. Much of the district is in a dry midland agro-ecology zone (61.83%), followed by a dry lowland (27%) and highlands (10.69%). The

district is characterised by a high population density and intensively cultivated land with crops including cereals, pulses and oil crops. Teff, maize, and sorghum are the major cereal crops in this area. The district has bimodal rainfall, with the first short rain season starting in February and ending in May. Although some villages in the district plant crops during this season, the majority do not because of the unreliable nature of the season. The main rain season starts in June and extends until September and is the main agricultural production season. The rainfall volume is more stable in this season, although recent years have exhibited variability, with negative impacts on local agricultural production. While the highlands receive 900-1400 mm of annual rainfall, the midland and the lowland areas receive less than 900 mm of annual rainfall which makes the district a drought prone area (MoWR 2007). The specific villages selected for this study were Woyniye and Laste-Gerado villages in Gubalafto District and Addiskign and Aradom villages from Kobo Distirict. Below is a brief description of these villages. The data for their description was obtained from their respective village administrations.



(Source: Based on OCHA/ReliefWeb)

Figure 2: Location map of the study areas

Study Village 1, Kebele⁸ 011: Woyniye

This village has five micro watersheds. The total population of the village is 11183 with 2286 households, of which 1760 are male headed and 526 are female headed. The village has a mixed farming livelihood system, with 3704 cattle, 1534 small ruminants and 2729 pack animals. The village has a maximum elevation of 2033 masl and has a total area of 2866 ha, out of which 1362 ha is farmland, 79 ha is grazing land and the remainder is used for miscellaneous purposes. Close to 83% of the village has *woyna-dega* agro-ecology, with an average temperature of 23 °c. The village has a conspicuously sloppy landform, exposing it to frequent flooding and soil erosion.

Study Village 2, Kebele 03: Laste Gerado

This village has a total population of 4029 with 982 households, of which 773 are male headed and 248 are female headed. It has a total size of 2835.57 ha, out of which 1579 ha is cultivable, 1003 ha is forest, 139 ha is grazing land and the remainder is used for miscellaneous purposes. The average landholding per farmer in the village is 0.75 ha. The altitude of the village ranges from 900-1500 masl. Close to 80% of the landscape of the village is flat and the rest is mountainous and valley. The village falls under *kola* agro-ecological zoning in Ethiopia. The village has a mixed livelihood system, with 5258 cattle, 1524 small ruminants, and 3275 pack animals.

Study Village 3, Kebele 03: Aradom Village

This village has a total population of 5423 with 1791 households, of which 1351 are male headed and 440 are female headed. The total area of the village is 4228 ha, of which close to 60% of the landscape is flat with the rest being mountainous and valley landscapes. The village has an altitude ranging from 1500-1800 masl, with 98% of the village falling under the *kola* agro-ecological classification. Aradom village is among the villages in the district with large areas of irrigated land. While the total cultivable land is 1815 ha, the total irrigated land in the village is 978 ha, out of which 400 ha is under a river diversion flood irrigation scheme, 273 is under a groundwater irrigation scheme and the rest is under a supplementary pump based irrigation system.

Study Village 4, Kebele 05: Addis Kign

⁸ *Kebeles* are neighbourhoods, which are the lowest administrative units in Ethiopia.

This village is one of the *Kebeles* in Kobo district. The village has 1706 households, of which 1385 are male headed and 321 are female headed. The total population of the village is 6901, out of which 29965 are male and 3936 are female. The total area of the village is 10938 ha, out of which about 2415 ha is cultivable land, 1502 ha forest land, 2800 ha grazing land and the rest used for other land use purposes. Close to half of the village landscape is flat, around 30 % of it is mountainous and the rest is valley areas. The village has both modern and traditional irrigation systems. The modern irrigation system is based on two ground water based schemes affecting a total area of 90 ha, for a total of 230 households with 182 male headed and 48 female headed. The traditional scheme covers 22 ha with 58 beneficiary households.

3.6 Sampling procedure and sample size

Sampling procedures for critical realist oriented studies take theoretical sampling as the main approach for selecting respondents for a study (Pratt 1995; Yeung 1997). What this means is that sample size and sampling procedures are dictated mainly by the theoretical requirements of the study (Bernard and Ryan 2010; Hoggart, Lees, and Davies 2002; Miles and Huberman 1994). The research questions guide the sample size as well as the sampling procedure used. Accordingly, this section provides the sampling procedure used to select the case study areas and the respondents for the two cases selected for the study. Since the nature of the two case studies is different, slightly different procedures of sampling were used for each.

For the watershed development case study in the Gubalafto district, the first decision was on the number of villages to consider for the study. Given the limited time and budget for the study, it was decided to focus on two selected villages. After a thorough discussion with the Gubalafto District Agriculture Office experts, Woyniye and Laste Gerado were selected as case study areas. Woyniye village, which will be referred to as “study village one” henceforth, was selected as a representative of well performing watershed development interventions. The village had been ranked among the three best performing villages for three years in row on its watershed development performance. The village has been used by the district as an example of the best practices in integrated natural resource management work. The second village selected was Laste Gerado, which will be referred to as “study village two” henceforth. This village is one of the worst performing villages in the district, ranked

among the lowest three of the thirty-four villages in the district for three consecutive years. Both study villages had been involved in natural resource management interventions for over 40 years.

The selection of respondents followed a purposive sampling procedure. A purposive sampling procedure is a sampling procedure which involves the selection of sample respondents based on pre-determined criteria (Bernard and Ryan 2010). The selection process involved multiple stages. For the first village, the villagers were first divided into two groups: those who live at the upper catchment of the village and those who live at the lower catchment of the village. These two groups of villagers often face different sets of climate and other livelihood risks because of the striking elevation differences between them. Then, the village development team organizations were used to narrow down the sampling population. Development teams are government organized teams that comprise 20-30 neighbouring farmers. Accordingly, the 65 development teams in the village were divided between upper catchment and lower catchment. Three development teams from each catchment were selected randomly. From each development team two respondents were selected. Accordingly, six of the respondents were from the upper catchment and six were from the lower catchment. Out of these respondents, seven were party members and five were non-party members. Party membership was taken as a sampling criterion because of the political nature of the case study intervention and the explicit use of party membership by the government for the purposes of mobilizing local communities. For the second study village, sampling began by stratifying the village into the three sub-villages. Development teams were chosen from each sub-village. Party membership and gender were also used as selection criteria. Accordingly, there were 12 respondents selected for individual interview, four from each neighbourhood. Out of this 12, five were party members and seven were non-party members. Two of the respondents were women.

For the irrigation management intervention case study of the Kobo-Girana Valley Development Program, a two stage sampling procedure was used. In the first stage, the irrigation user's cooperatives⁹ were sampled. The cooperatives were chosen using two areas of criteria: the technology used for the irrigation water distribution, and the age of the cooperatives. Technology was used as a criterion because of its crucial role in determining

⁹ Irrigation users cooperatives are cooperatives organized around each irrigation scheme with an average of 165 members.

management decisions. The age of the cooperatives was used because of its potential in affecting group cohesion and learning. Accordingly, two cooperatives were chosen, one in Adikign village, Waja Golisha number 13 and another in Aradome village, Hormat Golina number 1. The Waja Golisha number 13 irrigation users' cooperative was established four years ago, and uses flooding as an irrigation water distribution system. The Hormat Golina number 1 cooperative uses a drip and sprinkler system for water distribution and was established 11 years ago. In the second stage, the sample respondents were selected. The list of members of the cooperatives was obtained from each cooperative's agronomist and was used as a sampling frame. Members of the cooperatives were stratified according to their farm land size. Land size was used as criterion as it could reflect members' commitments to their cooperatives. Accordingly, 10 respondents were chosen from each cooperative for individual interview. Two of the respondents had large amounts of land, two had small amounts of land and the rest had medium amounts of land. The total sample size for the individual interviews in both projects was 20. On top of the two cooperatives used for interviews, the other two cooperative managed by the agronomists of the selected cooperatives were also taken as sample for focus group discussion, meaning that a total of six irrigation cooperatives were studied.

3.7 Methods of data collection

Data collection for critical realist research requires both extensive and intensive methods. While the former is used to capture contexts and contingencies, the latter is used to understand causal mechanisms. Extensive methods of data collection include document analysis and surveys. Intensive methods on the other hand include observations and interviews. It is important to have flexible data collection methods, to allow the research process to capture emerging issues through the process of abstraction and empirical work (Yeung 1997; Pratt 1995). Accordingly, a number of intensive and extensive methods of data collection methods were used for this study. Below is a brief description of the methods used.

Documents Review

Document analyses have some unique advantage in qualitative studies. Hoggart, Lees, and Davies (2002) identified five such merits. First, documents allow access to data which could not otherwise be collected with personal contact. Second, documents are non-reactive, meaning that their content does not alter because of the research process. Third, documents allow the investigation of a long time frame. Fourthly, documents help to extend the inference of data collected from small samples to a larger domain and fifthly, documents enable researchers to see behind the scenes of sensitive issues such as policymaking processes.

Accordingly, documents from different sources were used for this study. Document review was used as the main source for examining the practices of experts. Since documents from multiple levels were reviewed, it provides a multi-scale overview of climate risks and risk governance perspectives. Three sets of documents were used as a source of information. The first set were scientific publications on climate change adaptation, land degradation and land management interventions such as soil and water conservation and irrigation. The second were policy documents on rural and agricultural development, water resource development and climate risk management. The third were different planning and reporting documents. These were gathered from the Amhara Regional State Agriculture Office, the North Wollo Administrative Zone Office of Agriculture, the Gubalafto District Agriculture Office and the Kobo-Girana Valley Development Program. The documents were strategic plans, annual plans, annual reports, monthly feedbacks and project documents. A total of 25 documents were reviewed, including: 11 regional level documents, four zonal level documents and 10 district level documents.

The plan and report documents were also used to obtain official appraisals of the success achieved in the interventions, although these documents contain significant bias. As stated in the documents themselves, experts tend to exaggerate their plans and achievements to satisfy the expectations of their superiors. False reporting has been an important weakness of these documents. This underscores the need to take official figures with caution. However, these documents are valuable for two reasons. First, they are the only sources available to understand the impacts and perceptions of intervention programs at different levels. There are no other independent data sources that can give us the “official” account of the interventions. Second, the documents are subjected to rigorous scrutiny by higher-level supervisors. For

example, oftentimes regional, zonal and district experts and officials visit and monitor programs being implemented on the ground. This often involves comparing reported performances from one level with the field estimation of performances from a higher level. This feedback system is thus used to assess the truthfulness of reports submitted by lower level administrative units in the reporting chain. The feedback sent from higher levels to lower levels was to be very useful. Unlike the reports and plans, the feedback has a stronger tone when pointing out weaknesses and strengths in the case study interventions.

Individual Interviews

Interviews are a method of data collection based on a close encounters between researchers and the research subjects. It is a method of “making culture to speak itself through individual stories with people who are willing and able to comment on their experiences and articulate their feelings and values” (Hoggart, Lees, and Davies 2002). This study involved a total of 44 interviews, 24 for the watershed development intervention case and 20 for the irrigation management intervention case. The average time for an interview was 53 min, with a maximum time of two hours and the minimum time of 30 minutes. The interviews were recorded using a sound recorder with permission of the respondents. The researcher conducted all the interviews. The interviews were conducted at a convenient time and place for the respondents, which was mostly at the respondent’s home or farm. The interviews began with an overall introduction to the research and a request for the consent of the respondents. However even many of those that gave consent were suspicious about the identity of the researcher and provided him with only politically correct answers, assuming that he was a government representative. In these situations, the researcher took time to explain himself again, detail his identity and confirming that he was acting in the capacity of an independent researcher. He would also reassure them that their personal information would remain anonymous.

Some of the content of the interview remained the same for all respondents of the two case studies. They were all asked questions about the risks that they face in their farming and other livelihood activities, the risk management strategy that they pursued to cope with the risks they face, their opinion on the implementation processes of the interventions under study, and their collective learning experiences. Because of the difference in the nature of the watershed development and irrigation interventions the specific questions asked during

individual interviews differed between the two cases. Although some sets of questions were asked across the board, some questions were added and other omitted as the field work progressed. This helped the researcher to focus his attention on developing an overall narration about the research questions.

Key Informants Interviews

Key informants are individuals who are exceptionally knowledgeable on certain issue at hand and are willing to share it with a researcher (Bernard and Ryan 2010). In this study, key informant interviews were mainly conducted with experts at different level. A total of 11 interviews were conducted with experts from the regional, zonal and district levels. These interviews were used to either cross-check or elaborate information obtained during document review or from individual interviews. As a result, the interview guides remained flexible in order to accommodate to the specific information sought from each key informant. The maximum length of a key informant interview was one hour and 30 minutes and the shortest was 30 minutes, with the average of one hour. All the interviews were conducted in the office of the experts.

Focus Group Discussions

Focus groups discussion is a method of data collection that utilizes group interaction among participants. They can be used to get detailed information from participants or to get a quick data from groups in situations where individual interviews would take too much time (Hoggart, Lees, and Davies 2002). Focus groups were used in this study for both purposes, depending on the group. For example, when gathering information from experts, two focus groups were conducted, one for each case study intervention. The discussions focused on the specific aspects of the intervention which required a detailed opinion from the experts. At village level on the other hand, for the watershed management intervention case, focus group discussions were held with development team leaders, development team members and female farmers in order address the specific issues that concern these groups with regard to the intervention. For the irrigation intervention case, focus group discussions were held with members of the executive committees of the irrigation scheme cooperatives. The number of participants for the discussion varied from five to seven. There were 13 focus group discussions conducted. The average time for a focus group discussion was 1 hour.

Observations

Observations are a method of data collection in which researchers take note of the things that they perceive first-hand, especially in regard to the everyday lives of their research subjects their everyday life. Quoting Junker (1960), Hoggart, Lees, and Davies (2002) identified four types of observation that are used in research methodology: the complete participant, the complete observer, the participant observer and the observer as participant. While in the case of participant observation participation is prioritized over observation, in the case of observer as participant observation is prioritized over participation. In this study, both participant observation and observation as a participant were used as research data collection methods. Participation in community activities had two purposes. First, they were an effective way to build to trust with the community members in the study areas and strike up informal discussions. Second, observations provide the researcher with insights which would otherwise be too sensitive and complex to capture with interviews. The researcher participated in a variety of community meetings including: village council meetings, party members meetings, development team leader meetings, village wide community meetings, irrigation cooperatives meetings and irrigation cooperative executive committee meetings. The researcher also took part in actual farming and natural resource management practices such as assisting farmers in irrigating their farms and working along with farmers during the watershed development campaign. These activities gave the researcher insights into politically sensitive issues, which many of the respondents would refuse to openly talk about in interviews. It also allowed him to capture moments of latent and overt resistance in community members towards some aspects of the interventions. A total of 37 entries of observation memos were used for the analysis.



(Source: Own photograph)

Figure 3: Fieldwork activities

3.8 Data analysis and write up

In line with the critical realist orientation of this study, this research uses a modified grounded theory which combines inductive and deductive methods to analyse the field work data (Miles and Huberman 1994; Pratt 1995). Theories were used to create pre-codes and new codes were created as the analysis progressed (Miles and Huberman 1994). In a way, the analysis process started when the researcher went for the first round of fieldwork with a set of guiding questions that were informed by theories. As the fieldwork progressed, the researcher reflected on the data that was collected and refined the research questions accordingly. For each study site, around half way through the field stay, the researcher would take a few days to skim through the interviews in order to make sense of and reflect on them. This same process was repeated during the second case study.

The analysis proceeded during the fieldwork by transcribing the interview data. The data was translated from Amharic to English and transcribed using audio transcription software called “f4transkription”. Additionally, a qualitative data analysis software called “MAXQDA” version 11 was used to assist during the analysis process. This time the analysis began with coding. Coding was done by reading selected interview transcripts line by line and labelling them. The initial list generated by the process was over 300 codes. Through further reflection, the initial codes were narrowed down to a final list of 35 codes, which were further classified into six thematic areas namely: vulnerability, adaptation as a collective action problem, the role of the state, disincentives of collaboration among actors, the nature of the interventions, social learning platforms and implication of resource management processes for adaptation. The vulnerability theme includes codes such as: climate risks, vulnerability framing, and coping mechanisms. The adaptation as a collective action theme includes codes such as: the nature of interdependence among actors, the importance of working together, the challenges of working together, and people’s choice to work either alone or together with others. The role of the state theme includes the codes: framing the state’s roles, facilitation using coercion, facilitation using catalyst roles, the state’s avoidance of its responsibilities, the state in its own eyes, and forms of resistance against the state interventions. The disincentives for collaboration thematic area includes the codes: not valuing collaboration, poor incentives for collaboration, weak controlling mechanism, ignorance, poor work culture, absenteeism, vandalism on public work structures, leadership failure, free grazing, and by-law implementation. The nature of interventions theme includes the codes: quality and coverage of interventions, nature of the intervention in the watershed development, and the nature of the interventions in irrigation management. The social learning platforms theme includes the codes: platforms, facilitation, decision making, forms of learning, and learning asymmetries. The adaptation outcome theme includes the codes: adaptation benefits of the interventions, and the limitations of the interventions. After this initial coding, the actual coding continued with all the interview transcripts that were selected for analysis. In doing so, new codes were created and some codes were abandoned to respond to the emerging trend in the data.

After the coding was complete, all the coded segments were retrieved from MAXQDA to write a summary story of the coded segments. This summary was then used to generate the arguments which answer the research questions of the study. As the write up process is actually considered as the main analysis stage of a qualitative research (Pratt 1995), the

researcher went through an iterative process of reflection and analysis between the data, the theoretical framework and the overall narrative that was developing.

The iterative analytical approach of going between empirical observations and theoretical perspectives helped the researcher to refine the research questions and respond to emerging issues in the field (Sayer 1992). A case worth mentioning here is the shift of the theoretical approach of the study from a purely social learning theoretical perspective to a more broad political ecology oriented theoretical framework. This was a result of a continuous reflection on the empirical experience, the data collected and theoretical readings.

Chapter Four

Understanding the Vulnerability Context of the Study Area

4.1 Introduction

This chapter explores the construction of vulnerability to climate related risks by different actors located within and outside of the places of the study area. The assumption here is that understanding the vulnerability and vulnerability framings of different actors is a first step towards unpacking elements of transformational adaptation (Marino and Ribot 2012; Ribot 2011). Conventional climate change vulnerability studies focus on characterizing different social categories in terms of actual or expected impacts of a certain change in climate parameters. Such studies put climate risks at the centre of their analysis. The problem with this kind of research is that it not only give bio-physical climate change an artificial centre stage , but it also obscures the way different hazards interact to produce livelihood risks (Taylor 2014). To break away from such a trap, this study focuses on identifying a multiplicity of risk settings, both climate and non-climate, and risks perceptions to understand how livelihood risks are produced in the study areas. By doing so it situates climate risks within the broader context of the social vulnerability of a particular area.

This chapter sets the scene for the subsequent chapters on adaptation. Concurring with the argument of Ribot (2011), this chapter argues that an effectiveness assessment of any adaptation action needs to start with a proper understanding of the social-vulnerability context of a particular area. There are various vulnerability assessment frameworks which set out to understand the complex interplay of exposure, sensitivity and adaptive capacity (Birkmann 2012; Turner et al. 2003a). However, these frameworks present vulnerability as a value free assessment which requires the identification of sets of indicators and field measurement. In practice, the definition of even the often agreed upon components of vulnerability, namely exposure, sensitivity and adaptive capacity, is value loaded. What this means is that people with different values and interests can define vulnerability contexts differently which thus results in different outcomes (O'Brien and Wolf 2010).

Hence, this study takes the existing vulnerability assessment one step further by including the role of power in the different vulnerability framings of places. The concept used to introduce

this aspect is riskscapes (Müller-Mahn and Everts 2013). The use of riskscapes enables us to identify risks with their material and discursive aspects and map the different riskscapes created by the practices of different actors (ibid). To this end, the study investigates risk settings and risk perceptions of expert and local community actors with regard to: the livelihood activities of people in the study area, their asset bases, livelihood strategies, different sources of shocks, and their coping strategies (Scoones 2009). The result is used to assess the effectiveness of adaptation interventions in chapters five and six.

This chapter is organized into six sections. Section 4.2 deals with the core livelihood risks that local community members in the study areas face in their everyday life. Section 4.3 analyses the source of livelihood risks, with a focus on the ecological, economic, social and political sources of vulnerability. Section 4.4 provides a perspective on how the different risk settings identified in section 4.3 interact with each other in the four study villages to produce unique livelihood risks. Section 4.5 assesses the risk management practices of local community farmers. Finally, section 4.6 gives the interim conclusion of the chapter.

4.2 Livelihood risks facing local communities in the study areas

People in rural Ethiopia face numerous livelihood risks in their day-to-day life. A comprehensive study of risks in general would require the study of all the risks involved in a certain area (November, 2008). However, this study focused on livelihood risks that are likely to be affected by climate change. Besides, some livelihood risks are intermediaries for more complex and multi-faceted risks. For example, while drought, degradation, and market failure could be considered risks in their own right, these risks could be considered causes of broader risks, such as food insecurity, poverty or even famine, which are more complex and feature multiple sources of stresses. Accordingly, the initial analysis was to identify the core risks that experts and local community members in the study areas consider important and address in their routine practices. The two core risks that stood out during the analysis of both expert and community practices were food insecurity and poverty. For example, the Amhara Region Agriculture Bureau strategic plan for 2010-2015 states;

“Because of failure to manage our natural resources and ensure their best use, environmental degradation, loss of productivity of farm and pasture lands, and a general natural resource degradation and land degradation have been exposing the people, especially those living in the North Eastern part of the region to chronic food

insecurity. As a result, many have migrated out. Even in those areas which are known to be surplus producing areas, such as the western part of the region, the amount of land which has been lost to degradation is immense.” (ARBAD-1)

The 2013/14 annual plan of the regional agricultural bureau also states that “because of our failure to manage our natural resources for our own benefit, the rains are eroding our farmland, our rivers are flowing useless, our ground water is untapped, and as a result the people of our region have been suffering from food insecurity” (ARBAD-1). At the zonal level, the zonal bureau of agriculture 2013/14 annual plan also states, “as our zone is characterized by a high level of hilly and valley terrain and having three of the big river basins of the country, it is highly exposed to serious soil erosion which makes the Zone highly vulnerable to chronic food insecurity” (NWZAOD-1). At the district level, interviews with the Gubalafto district administration and experts also show that food security is at the centre of their concern. One of the experts said;

“[...] we are more worried about food security. We have farmers who could not eat three times a day properly or cover their food demand for more than 6 months. Therefore, our focus has been rather on ensuring food security of our farmers. We believe that if we improve food security of the farmers in our district, it will have a positive effect on the national economy [...]” (GDAO-KII-1).

In Kobo district, the socio-economic study conducted as part of the project design for Kobo-Girana Valley Development Program states the following;

“Food insecurity and abject poverty are the major characteristics of the rural areas of Kobo and Habru areas. Though food insecurity is a function of many social, economic, physical, cultural and political factors, major causes in the two project weredas are land degradation and declining crop and land productivity, deterioration of productive household assets, shortage of land, drought, and poor access to support services and social infrastructure” (KGVDPD-1).

Interviews with local communities in the study area also identified the same core risks of food security and poverty as important risks in the study areas. The following are three quotations that show the way local communities express the risks;

“I gave my land for share cropping. Even the person who I gave my land for sharecropping is not getting enough for himself. Now we are living more on the

remittance from my daughter. What can I do with two or three sacks of grain; can I live even for a year with it? No, I can't”(V2-IIR-1).

“Now there is no forest, because there is no proper rain. There is no production in the short rain season. If it rains in April and we get rain in summer, we say that it is good season. When it is good, I might get up to 30 sacks of grain from my plot. There are also times when we lose it all. This happens when it rains in April, but stops during summer. This year for example it rained in April, but it stopped mid-August. Only those farmlands that had alternative water sources got some produce. This area is turning to desert. The last two three years are difficult. It is not too serious, to the extent of famine, but we are struggling”(V-2-IIR -11).

“Since early 1990's, even though we do not have problems with our livelihood, we have a variability of nature. [...] People work hard to get good product. However, the drought destroyed all our hard work many times. While we wanted to grow, it is nature, which is holding us. [...] This year, with God's will, if we get rain in September, the harvest will be nice this year. If we do not get rain in September, all our effort will be in vain” (V1-IIR-9).

The above discussions highlight two important points. First, it indicate the varied nature of the livelihood risks that different people face depending on their economic condition and social capital. Farmers with no other alternative economic options and limited social capital, live in the margins of food insecurity, where they must struggle constantly to feed their families. Those with a better economic condition and more social capital must diversify their income and rely on their social support to compensate for production and income loses on their farm. Even those who are better off in terms of supporting themselves from their farm activity find it hard to grow and improve their life and the lives of their family members. One can also notice that there are chains of explanations given as sources of risks to farming activity in the study areas. Experts frequently identified degradation, drought, and geographical features as prominent risks. Local communities on the other hand, mentioned market failure, soil fertility lose, state intervention and others as important sources of risk which in turn lead to other risks, such as food insecurity and poverty. This leads us to the next section, which looks in more detail at the riskscapes of both experts and local communities.

4.3 Multiplicity of risk settings in the study villages

One core aspect of riskscapes concept is recognition of the multiplicity and overlap of risk perceptions (Müller-Mahn and Everts 2013). Despite the agreement of the state and local communities in the identifying food security and poverty¹⁰ as the main risks facing farmer's livelihoods in the study area, there is a difference between them regarding the sources of the risks. What was common between all actors was the recognition that there are multiple sources of risks, that the risks overlap, and that the risks interact with one another. We can also see that different actors attribute the risks to different sources depending on their framing of the problem. This is in line with established vulnerability assessment frameworks, which recognize that multiple stressors can interact with each other to create hazardous conditions (Turner et al. 2003a; Birkmann et al. 2013).

Accordingly, the core question is what are the sources of risks of food insecurity and poverty in the study areas? This question does not have a single answer as it depends on what the different actors perceive as the source of the risks, described as their riskscapes henceforth. The data analysis identified five risk settings¹¹ that the state and local communities used to legitimize certain practices that they feel are important in addressing food insecurity and poverty in the study areas.

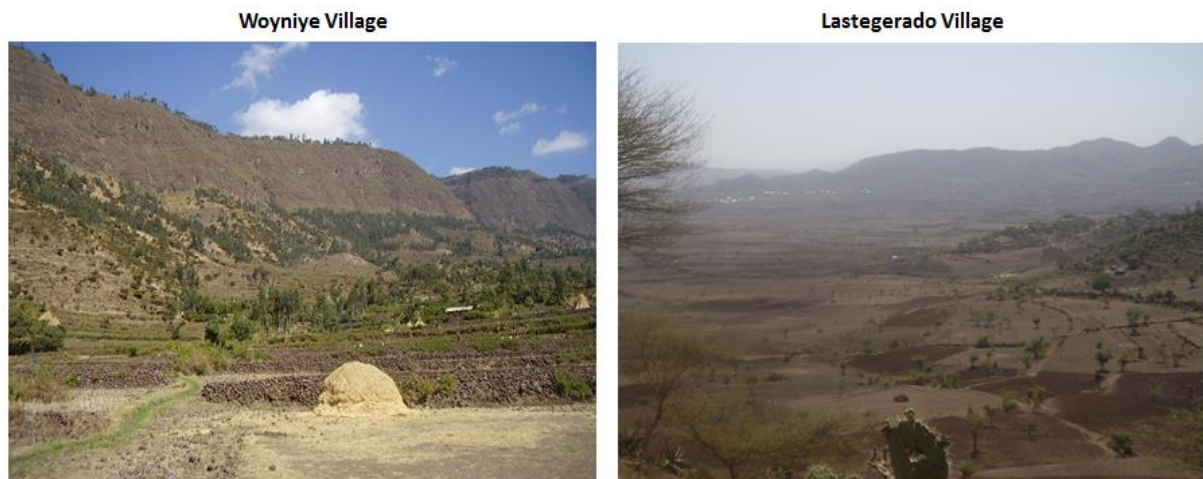
'Naturalized' risks settings

The first risk setting is what is called here the "naturalized" risk setting. It is called "naturalized", because both expert and local communities identified some aspect of nature as a source of risk. The word "naturalized" is used here to show that although these risk settings are often referred to as "natural", they are rarely a result of a natural phenomenon devoid of social context which could translate the natural events into hazard risks (O'Keefe, Westgate, and Wisner 1976). The Amharic expressions often used are *tefetro* and *yetefetro adega*, which literally means nature and natural disaster respectively. This risk setting is widely recognized among the experts and local communities alike. This risk setting includes both

¹⁰ In this context, food security and poverty are used to refer to local expressions of deprivation and destitution. Examples of local expression in Amharic include '*tegbo yemayadir*' or '*saybela yemiyadir*', which literally means someone who sleeps with half-full stomach or without eating at all. Both terms are used to refer to those people with a serious food insecurity situation. On the other hand, the Amharic expression such as '*dihinet*' refers to someone who is poor, with a limited capability to support one's family.

¹¹ A risk setting in this study refers to a category of risk that is underlined by a variety of different factors.

fixed and dynamic stressors. Examples of fixed stressors include the topography and climate of an area. For example, a regional level document shows that 66 % of Amhara Region’s land has undulating topography and 90% of the population lives in these areas, which subject the area for land degradation (ARABD-1). A zonal document also attributes undulating topography of the North Wollo administrative zone as a driver of land degradation (NWAOD-1).



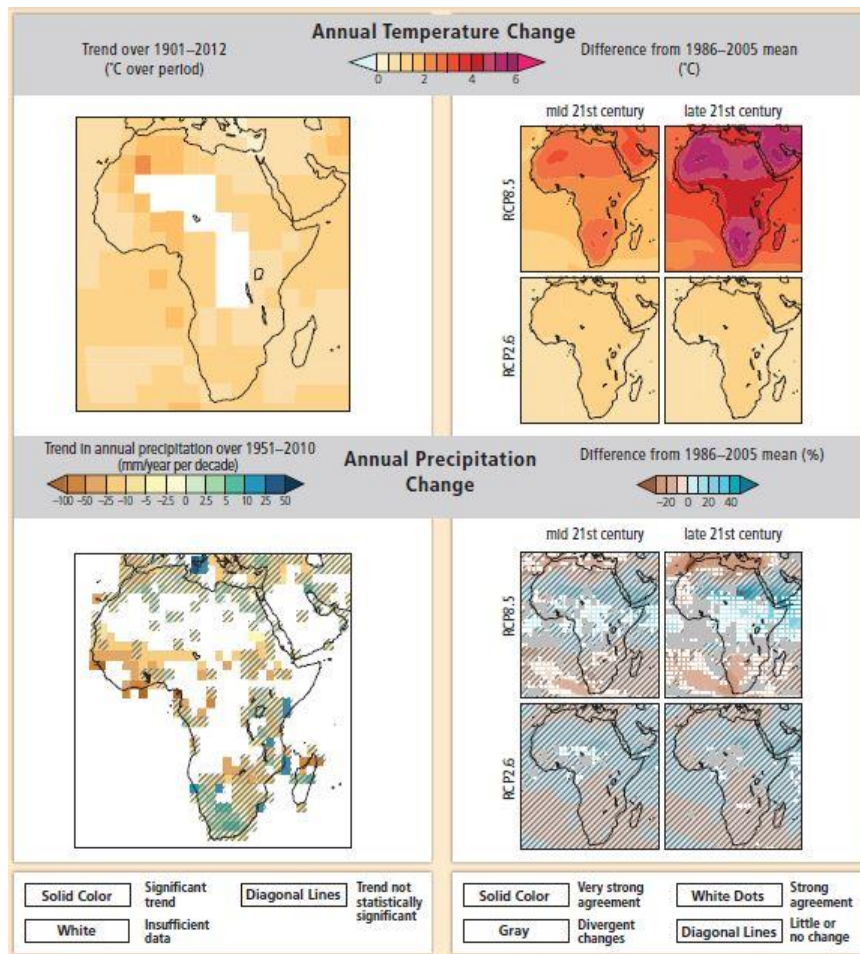
(Source: Own photo taken during field work)

Figure 4: Partial views of the two study villages with rugged and degraded terrain

The dynamic naturalized risk settings on the other hand include biophysical features with intra and inter annual variability. One example of such a risk setting is climate risk. There is an extensive body of expert and community practices regarding climate risk, extending from the global to the local levels. At the global level, the recently released fifth assessment report from the Intergovernmental Panel on Climate Change (IPCC), is the latest authoritative scientific evidence that we have on the state of the global climate system, with both past observations and future projections. This report concluded that “warming of the climate system is unequivocal” (IPCC 2014b). The last three decades have been warmer than any preceding decade since 1850 and the implications of these changes are immense. With a varied level of likelihood and confidence, the IPCC reported changes such as warmer and fewer cold days and nights over most land areas, warmer and more frequent hot days and nights over most land areas, heat waves, heavy precipitation events, an increase in the intensity and duration of droughts, an increase in intense tropical cyclone activity, and a marked rise in sea level. Most importantly however, the IPCC states that, within varying

levels of likelihood and confidence, it can be said that humans contributed to these changes and that these changes will continue in both the short and the long term (IPCC 2014b).

At the regional level, the IPCC provide insights on the impacts of climate change in Africa through its subsequent reports. In these reports, climate change is identified as an additional burden on an already stressful situation, affecting water resources, food security, natural resources, bio-diversity management, health, human settlement, infrastructure, desertification, energy, tourism, and coastal zones. Africa's vulnerability is said to lay within the prevailing socio-economic contexts which are mediated by the global political economy and weak adaptive capacity (Niang et al. 2014). In its fifth assessment report, the IPCC reported that “evidence of warming over land regions across Africa has increased, consistent with anthropogenic climate change” (Niang et al. 2014: 1202). There is a high likelihood of rising mean annual temperature and falling precipitation levels in Northern Africa and the southwestern part of South Africa (See figure below). Climate coupled with non-climate drivers threaten ecosystems, water resources, agricultural and food systems, and health sectors (ibid). However, these global observations of climate change are not easily traceable at national and sub-national levels. As it will be seen in the paragraphs to follow, the local observations have a lot of uncertainties and people's perceptions of climate risks is often a result of combined risks from other bio-physical and socio-political contexts of their area.



(Source: (Niang et al. 2014))

Figure 5: Observed global climate change trends

At the national level, studies on change in rainfall patterns do not show significant trends. However, spatial variability seems to be one of the main defining characteristics (Getnet 2013). For example, Seleshi and Zanke (2004) analysed data from 1965-2002 and found no trend in the annual and seasonal rainfall totals and rainy days over the central, northern and north-western Ethiopian highlands. However, the annual and the *kiremt* (long rainy season) total rainfall in eastern and southern Ethiopia show a significant decline since 1982. The same study showed a significant decline of *kiremt* rainy days in eastern Ethiopia within the periods 1965-81. The observations show that *belg* (short rainy season) rainfall tends to be more variable than *kiremt* rainfall.

At the sub-national level, in Amhara region where the study was conducted, an assessment made by Bewket and Declan Conway (2007) showed the geographic differentiation of rainfall patterns. The western part of the region exhibited a higher total annual rainfall and lower variability when compared to the eastern part. The authors found no systematic pattern of

change over the region regarding the probability of dry days, mean dry spell length, and daily rainfall. Rather, they reported that the region is characterized by an alternation of wet and dry years in a periodic pattern, with more dry years occurring (59%) than wet (41%) years over 29 year period. The 1980's were observed to be the driest, and the rainfall started recovering afterwards. They observed, the *belg* was more variable compared to *meher* across the region.

Conway (2000) also studied climatic conditions in the Wollo and Tigray areas, the former being in the northeast part of Amahara region where this study was conducted also. He found out that the rainfall regime in Tigray and Wollo fluctuated between wetter and drier periods during the Holocene era (the last 10,000 years). However, the most recent evidence for the past years and beyond showed no traceable trend in rainfall patterns. The years 1973 and 1984 were found to be the driest years on record and the 1990's seem to show a recovery from the dry period of the 1980s. Inter annual variability in general and *belg* rain fluctuation in particular was found to characterize the climatic condition of these areas. Hence, the author argued that the nature of the major famine events, such as the ones that occurred in the 1970's and the 1980's needs to be seen in the context of the historical and contemporary dynamics of socio-economic, political and environmental driving forces acting in these areas.

Experts at the Gubalafto district had a mixed view of the situation, based on their formal training and field experiences. One of the district expert interviewed shared his view by stating;

“We have a serious problem of moisture stress. This is due to a problem in the distribution of the rainfall. It is not raining at a time convenient for agronomic practices. We also sometimes receive rain at a time we do not need as it damages standing crops. Mind you, this is not problem with the total amount of rainfall. This is a problem that we usually face with experts who come from outside, especially donors. They bring us data with a total amount of rainfall and say that this amount of annual rainfall is enough for crop production and that there is no change in the amount that you are receiving. We always reply to them that the main problem in the north-eastern part of Amhara Region, which includes our district, is not a shortage in the total annual rainfall. Our problem is its timing. It usually comes late and withdraws early. The withdrawal is the major problem. Absence of enough moisture during the flowering stage, which is in September for most crops, is very critical. [...] Now

many of the former *belg season* producing areas in the district are not producing anymore. *Belg* season production is gone. Only those with irrigation access are producing *belg* by supplementing moisture stress with irrigation water.” (GDOA-KII-1)

The expert indicates that the total annual rainfall did not change, which is an observation that is substantiated by meteorological studies as well. However, the suitability of rainfall to the crop production cycle is what has been changing over years. The timing of the rainfall during the short rainy season, for example, made it difficult to produce *belg* in many places. Early withdrawal of rainfall during the seed setting stage of the crop cycle is observed to be a central bottleneck for farming in the district. The interview with the district agricultural bureau head also revealed a similar observation; “We always see things from the farmer’s perspective. Farmers in the district are not producing *belg*. Even production during *meher season* is not enough, farmers are not getting the usual rainfall distribution, and there is variability. They are also losing lots of farm land because of flooding” (GDAO-KII-2,). An irrigation agronomy study carried out by Kobo Girana Valley Development Program Office (KGVDP) also states that the annual total amount of rainfall (700-1020 mm) would be adequate to grow crops. However, the report argued that the pattern of rainfall in terms of its onset and withdrawal have changed drastically over the past 20 years. As a result, some years’ experience a significant reduction of crop yield, with partial and at times total crop failure was observed. It further argued that this phenomenon makes Kobo district one of the critically food insecure districts in the region (KGVDPD-2). The socio-economic study also noted;

“In the *belg* season the majority of the households’ plant maize and sorghum and in the highlands and mid altitudes they plant pulses, wheat and barley. Rainfall is unreliable and only a small proportion of annual agricultural production is produced in this season. The main rainy season, extends from June to September and it is the main agricultural production season. Rainfall volume and pattern in the main rainy season is more reliable although in recent years changes have been significant with substantial impacts on agricultural production and livelihoods” (KGVDPD-1)

At the village level, the first village needed the short rain season as it had been very important in this village for *belg* production. More recently, however, the respondents indicated that the amount of rainfall during *belg* is not enough. One elderly respondent said “[...] the rains during the *belg* season do not fit well with the crop calendar [...]” (V1-IIR-8). The same was

reported in the second study village as one of the respondents said; “[...] now we don’t have *belg* rain, it has been very long since I planted *belg* [...]” (V2-IIR-4). The short rain season does not affect the third and fourth villages as they are not *belg* producing areas.

During the long rain season in the first two villages, the onset of the rainfall is said to be adequate although at times it is late. The early withdrawal of rainfall, however, is said to be happening more often to the detriment of crop production in all the villages studied. The rain occurs normally during July and August and when the crops reach the seed setting stage, between the first and last weeks of September, the rains disappear. One of the interview respondents related his experience and fear as follows “[...] last year the rain stopped at the end of August, during the seed setting stage and the crop suffered a lot [...]” (V1-IIR-9). One of the focus group discussion participants from the second village said “It usually rains well during the early stages of the crop life, but when it reaches to the time of flowering and seed setting, the rain stops” (V2-FGD-1). In the third and fourth study villages, farmers face both the late onset and early withdrawal of rainfall. While farmers need the rain up to end of September, it tends to withdraw during last week of August. One respondent from the fourth study village said, “In the past we used to receive rains with not much prayer. These days, the rains come after a long prayer” (V4-IIR-6).

Perceived changes		Village One	Village Two	Village Three	Village Four
Long rain season	Total amount	No change	Reduced	Highly reduced	Highly reduced
	Onset	Slightly delayed	Delayed	Highly delayed	Highly delayed
	Withdrawal	Very early	Very early	Very early	
Short rain season	Total	Significantly reduced	Disappearing	NA	NA
	Onset	Delayed	Very late	NA	NA
	Withdrawal	Early	Very early	NA	NA

(Source: Own analysis from field work)

Table 1: Summary of climate related risk settings in the four study villages

Other dynamic naturalized risk settings include soil fertility loss, crop pests and weeds. In the Kobo district for example, the KGVDP socioeconomic study states that the degradation of

soil has already exhausted the fertility of the land with a significant reduction in crop productivity compared to other districts. The decline of soil fertility is associated with over cultivation, soil erosion, overgrazing and poor farm practices. It states further that due to environmental degradation and lack of control mechanisms, crop pests, diseases, and weeds are very common resulting in substantial production loss both in the field and during storage (KGVDPD-2). The irrigation agronomy report of the same project indicates armyworms, stake borer, wollo bush crickets, and sorghum chaffer as serious threats for crop production in the area (KGVDPD-1).

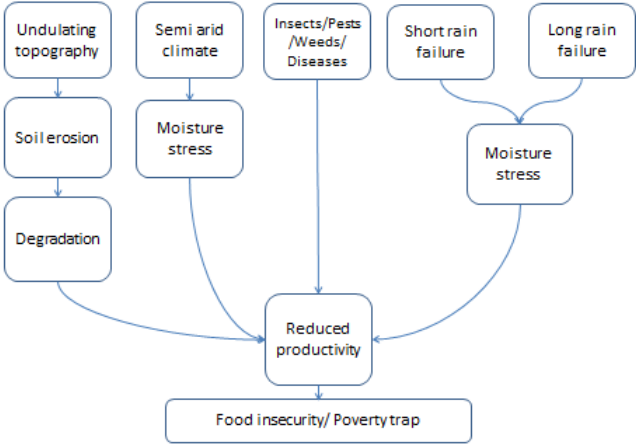


Figure 6: Naturalized risk settings

In sum, the “naturalized” risk settings are referred to as such because experts and local community often associate them with nature. Some of the ‘natural’ sources of risks are essentially fixed or static nature, such as topography and climate. Others are dynamic, in that they vary with time, an example being climate related risks. Both the expert and community practices from different scale recognize changes in the climate system. There are however, three important observations to be made in this regard. The first is that despite the global and regional level recognition of climate change and its impacts, at the national and sub-national level is more difficult to discern as no clear trends have been observed in some critical climate variables such as precipitation. Second, the framing of this risk setting at the local level indicates the complexity of transformation of climate change impacts into livelihood risks. Discussion with both local experts and local community members showed that what matters most is not the total amount of rainfall, but its timing with respect to cropping calendars. Third, other biophysical features such as topography and environmental degradation also mediate the impacts of climate hazards. Since crop calendars are a result of environmental

factors along with a host of socio-economic and political factors, climate risks translate into negative impacts through these socio-economic and political factors as well.

‘Subsistence’ risk settings

The second risk setting is referred to a ‘subsistence’ risk setting. This risk framing holds that due to the absence of alternative livelihood options, farmers used the environment for cultivation for centuries, which lead to the exhaustion of the resource base and the degradation of farmlands and rangelands. The framing is found in different government documents at different levels. For example, a regional document states, “the majority of our regional population lives in rural areas and its livelihood is highly attached to nature and hence, they suffer a lot when natural disasters happen” (ARBAD-2).

While acknowledging the subsistence requirement of farmers, this risk framing blames them for using traditional practices and irresponsibly using resources that led to the degradation their natural resource base. At the regional level, for example, the regional soil and water conservation assessment report states “the highland areas of the region, because of many years of traditional agricultural production coupled with deforestation and expanding farmland to meet the needs of the even increasing human and livestock population have led to severe land degradation” (ARBAD-3). Another regional document blames the free grazing system for livestock production in the region along with the traditional farming practices for the degradation of the resource base in the region (ARBAD-2). At the district level, the Gubalafto district agriculture bureau head, for example, stated in an interview, “The reason for change in our climate condition is because of degradation of our natural resource base in the district. Farmers also recognize this. They accept that they are the ones to blame because they are the ones who destroy their natural resources base” (GDAO-KII-2). The district lead plan for 2013/14 also portrays farmers as procrastinating, backward, risk averse and lazy in dealing with their challenge and accepting recommendations that are meant to assist them in fighting poverty and ensuring their food security (GDAOD-1).

Local communities dispute this risk framing with ambivalence. There are those who claim that they are effective guardians of their environment, attributing local degradation to factors such as population growth (V1-IIR-6). Others admit that they failed collectively to preserve their natural resource base and that they continue to struggle to do so. A typical example is

the issue of free grazing, especially in second study village. Although its negative impacts are vivid at village level, the villagers admit that they failed to stop it because livestock are core part of their mixed farming system and have no alternative feed source (V2-FGD-1).

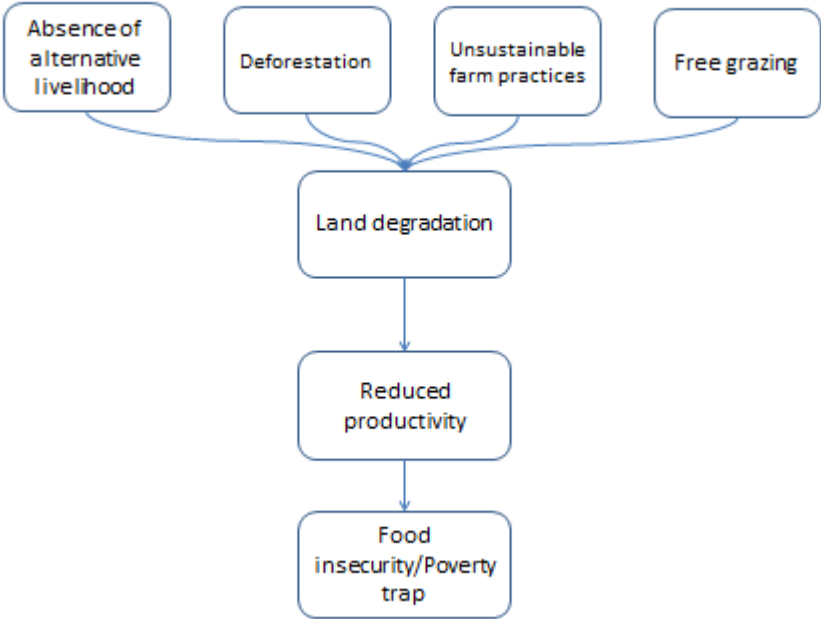


Figure 7: Subsistence risk setting

‘Demographic’ risk setting

The third risk setting is referred to a ‘demographic’ risk setting. This risk setting links livelihood risks with high population pressure, which results in the fragmentation of farmlands and over exploitation of natural resources. The population of the four study villages has increased dramatically over the past few years. However, access to critical resources such as land has been in short supply. In the first village, the last time land was redistributed was in early 1990’s. Because of the small size of the land, an average of 0.25 ha, parents have hardly been able to share part of their land with their children. Those individuals who were a little less than 18 years of age during that time have been left without access to land. In the other three study villages as well, a population increase led to the fragmentation of land as parents’ dividing their farm plot to give to their children.

This risk setting is one of the classic sources of risk. In Kobo district, for example, population pressure and declining land-holding size are said to undermine the livelihood of people along with other factors such as drought and soil erosion. The irrigation agronomy report of the KGVDP indicated that over 79% of the households in the project area have less than one ha of land, with many landless youth finding it hard to sustain themselves (KGVDPD-2).

This “demographic” risk setting is also claimed to cause competition over existing resources, whereby an increase in the number of users stretches the existing resource base to such an extent that it threatens local livelihoods. Examples of this risk setting are found in two of the study villages, in study village one and study village three. In study village one, the river which is used for irrigation flows from upstream villages. Because of increased attention to irrigation practices as well as extensive soil and water conservation work undertaken in the upstream villages, the river flow for irrigation in this particular village is reducing. The elders say that when the irrigation system was first constructed after the drought of 1984 and all through the 1990’s, the use of irrigation was minimal. Some farmers even used to resist allowing irrigation on their farm claiming that it would harm the productivity of their plot. In recent years, however, irrigation use has increased dramatically. This could be attributed to a number of factors including: the extensive promotion of water use for irrigation by the government, a general increase in the farm gate price of agricultural products, and inflation, which means that farmers must produce more to support their daily needs. One of the female respondents stated, “The irrigation flow is small now. People are diverting it from the upstream. Those in the village are also now aware of the use of the irrigation. As a result, both the flow and the amount of water we get have reduced significantly” (V1-IIR -12). In study village three and four, there was a common saying that the farmers of Raya, where the study villages are located, live off floods from the highlands. This is because the plains of Raya receive flood from the highlands due to its geographic position. When the flood reaches the lowland villages through rivers and streams, its speed is already reduced and farmers organize themselves to divide the flood among different villages and each village divides it among their farms. However, with more people interested in the upstream floodwater, those in downstream villages are getting less water, with the local estimate of the reduction being put at 50 percent over the last 10 years (V3-IIR-11, V4-IIR-9).

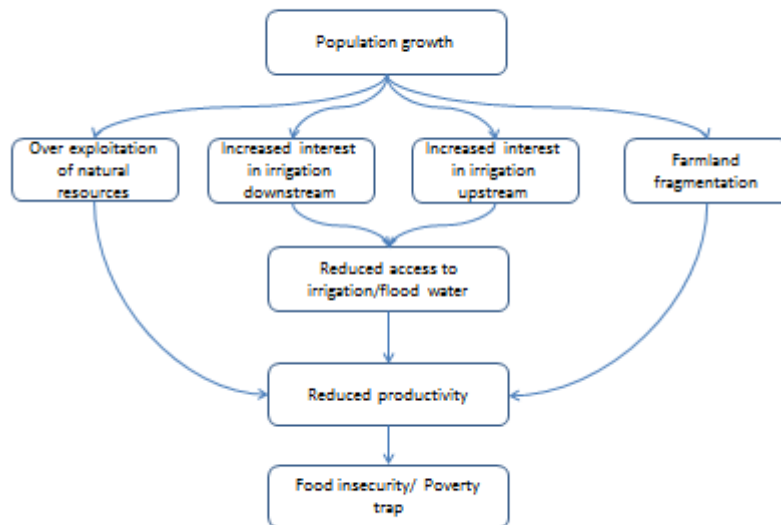


Figure 8: Demographic risk setting

Market volatility risk setting

The fourth risk setting is referred to as a “market volatility” risk setting which is a source of risk related to the input as well as the output markets. The irrigation agronomy report of KGVDP, for example, states that farming practices in the project area are still traditional. It states that farmers are usually wary of using improved practices given their circumstances of unpredictable rainfall patterns, pest and disease incidences, as well as high prices and limited access to improved technologies (KGVDPD-2). The socio-economic study of KGVDP in Kobo district also states the following;

“Seasonal fluctuation of crop prices, increasing prices of basic farm inputs, lack of transport and road network, under developed infrastructure, lack of access to market information, etc. are the major problems limiting crop production. With increasing production in good rains farmers suffer from low prices and demand. With bad rains the farmers lost all their purchasing power and productivity due to lack of cash income and continuously increasing prices of inputs and other basic commodities.”

This risk setting was mentioned frequently in all the study villages, except the second one. In these three study villages, farmers often use purchased agricultural inputs and produce for

market sell due to the existence of irrigation infrastructure. As a result, they often complain about the souring agricultural input prices and unstable output prices (V1-IIR-1, V3-IIR-3, V4-IIR-3).

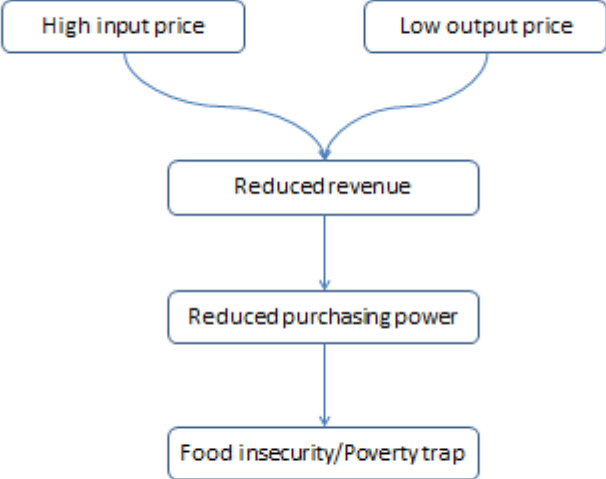


Figure 9: Market volatility setting

Policy failure risk setting

The fifth risk setting is referred to as a “policy failure” risk setting, whereby local communities accuse government officials of forcing them to engage in risky farming practices or limiting their access to critical resources that are essential for their livelihood. Arguably, fertilizer is one of the most controversial technologies among farmers, especially among those without access to irrigation. The argument of many local farmers is, given that fertilizers, especially urea, require moisture during seed setting state of the crop, the uncertainty of the rainfall means that there is a good chance of the fertilizer drying out the crop (V1-IIR-9). Hence, farmers face a double lose: the loss of their produce and the loss of the money they spent on the fertilizer. However, these concerns are often interpreted by government officials as a risk averseness and suspicion of new technical practices on the farmer’s side (GDAOD-1). In the lowland areas such as the third and fourth study village, farmers often take the fertilizer because they are forced to, but they will then sell it in the black market for a cheaper price since they are convinced that applying fertilizer on a non-irrigated farm will definitely

kill their crops. There were similar complaints for row planting, and the enclosure of former communal grazing lands where livestock used to graze freely. This has led to an overall sense of imposition from the development campaigns promoted by the government. In the first and second villages, there were recent stories of “improved” seeds for teff and wheat which yielded even less than the existing varieties. In almost all villages, farmers complained about the row planting of teff, arguing that they had not seen any benefit of it except its high labour demand (V1-IIR-9, V2-IIR-7, V3-IIR-5, V4-IIR).

The political leadership at higher levels often reads this risk setting differently. The political leaders attribute failures in technologies introduced to farmers not as technical failures, but rather as failures of their expert and political leadership. This is an interesting as the government itself does the blaming of its policies. Hence, documents regarding this risk setting often have an optimistic tone as the risk is seen more as underutilized potential that can be tapped for a better future. On one of the regional documents for example, it states: “the region is the source of major rivers, we have many lakes and huge ground water potential. We have thousands of small streams, ground water, which could be accessed with least cost, and an annual rainfall, which could be collected and made use of. However, because of our failure to make use of these natural resources, we are wasting our resources and remain trapped in food insecurity and poverty” (ARABD-1). The Gubalafto district plan also states that there is a serious leadership problem, both on the expert and political side as well as at the district and village levels, which do not embrace the possibility of overcoming current food security and poverty problems with the available natural resource potential and technical capabilities (GDAOD-1).

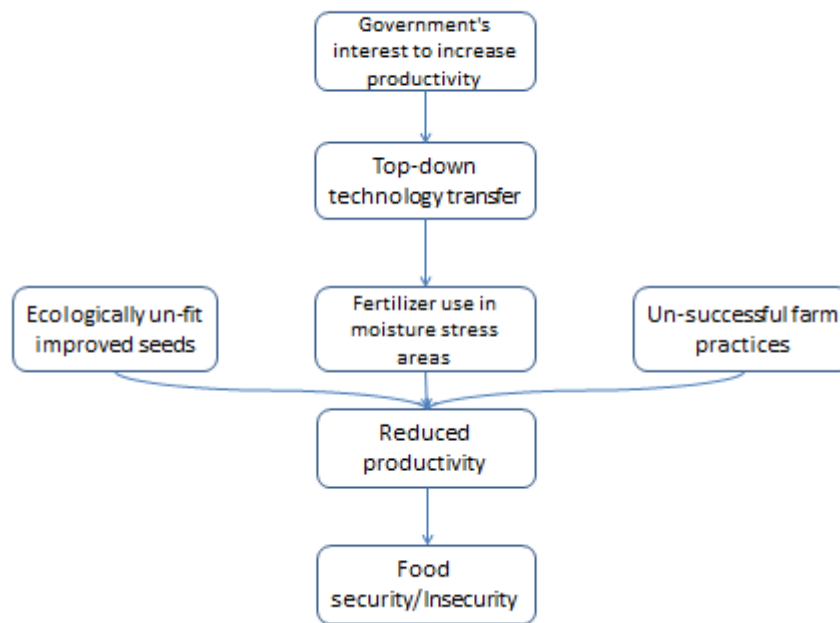


Figure 10: Government policy failure risk setting

In summary, there were differences among experts and local communities regarding the source of risks as each has their own framing of the problem situation and developed a particular set of risks. What was common, however, was the fact that both experts and local communities identified a set of risk settings that includes climate related risks together with other ecological, economic, social, and political sources of livelihood risks.

It is important to note that the identification of the five risk settings does not mean that there are no other risks in the areas, but rather that these are the risk settings that a majority of the respondents identified as important. This is in line with Müller-Mahn and Everts (2013:25), who said that what is important is to identify risks that are meaningful to a larger group or social formation. It is also important to note that there were convergences as well as divergences in the way that government experts and local communities frame the risk settings identified. For example, there was high degree of convergence on the naturalized risk setting, mainly on the climate related risks where both the experts and local communities identified climate risks at the major source of livelihood risks in the study areas. The subsistence risk setting was recognized more by the experts than local community members in the study areas. Experts squarely blame farmers for their precarious livelihood condition, attributing it to the farmers' laziness, procrastination and resource wasteful agricultural practices of the farmers. The

argument of the experts is that, even if climate risks are posing a significant challenge, it would not been impossible to cope with if farmers were keen to deal with it. Local community members however, were more focused on the demographic and market volatility risk settings as drivers of their food insecurity together with climate related risks. They also blame the top-down and at times ineffective government interventions as an exacerbating factor in their precarious livelihood situation. Government experts on the other hand, especially the those in the political wing of the government portray failed government interventions as the failures of their subordinates in lower level political and expert leadership positions.

4.4 Various forms of risk production in the study areas

The previous section provides an overview of the major riskscapes identified by experts and local community members. One important note in the above analysis is that not all the risk settings identified are equally important in all the study villages. Some of the risk settings are more important in some of the villages than in other villages. Hence, livelihood risks that arise from the interaction of the risk settings identified in the previous section also differ from village to village.

A social-vulnerability oriented assessment of risks focuses on the interaction of multiple sources of risks in creating stress on a livelihood system (Birkmann et al. 2013; Turner et al. 2003). The different risk settings interact with each other at a particular place to create a cumulative effect on people's livelihood. Since an entire area rather than specific individuals feel these effects, we turn our analysis towards understanding how livelihood risks are produced by the interaction of different risk settings in the four different villages of the case study area.

In all the four study villages, sorghum and teff are the major crops that farmers grow. In the first study village those who live in the upper catchment also grow wheat, barley, and millet while those in the lower catchment with access to irrigation grow sugar cane and vegetables. In third and fourth villages, onion, potato, and other vegetables are also grown using irrigation. The choice of these crops is not an arbitrary one. These are crops which came into being over a long period of time through traditional selection processes in order fit the agro-ecology of the area. These crop varieties also have qualities which allow them to survive

under moisture stress and low fertility conditions (Tesemma and Bechere 1998). For example, sorghum and millet are considered to be moisture stress resistant crops. In the highlands especially, they have proven to be resilient under moisture stress (Asfaw 2007). Teff is another crop that is well adapted to the study areas. Teff is another popular choice for farmers to produce, partly because it tolerates reasonable levels of drought and waterlogging (Assefa et al. 1999, Assefa et al. 1999). Wheat and barley are also important crops, especially in the first study village and at the upper catchment areas. Barley's importance increases in drought-prone areas and at higher elevations. (Lakew et al. 1997)

Hence, in general terms, the local agricultural production system in the study villages seem to have developed a certain level of resistance to changes in the level of moisture stress by using a varietal selection process to plant crops that are best suited to their ecology. Since the majority of the farmers still depend on their own landraces for production, their livelihood system has some adaptive capacity to absorb moderate climate related shocks. Nevertheless, despite growing well-adapted crops and crop varieties, farmers live with a constant struggle to make life out of risky and uncertain agricultural production. The risk settings identified in the previous section play out in unique ways in all the four villages and put the livelihood of the communities at risk.

As was seen in the previous section, climate related risk settings identified rainfall variability as an important production bottleneck in the four study areas. For example, *belg* season production is becoming extremely uncertain. One of the female respondent said, *belg* production used to be our backbone; now it is no more. People now depend only on *meher* production. The rains during the *belg* season do not fit well with the crop calendar" (V1-IIR-12). Another respondent said, "Well, we don't stop planting in *belg* completely. Whether it gives us or not, we try. It usually ends up drying, but we try our best and get small yields. It gives us some time and it fails other times. [...]. This year for example, I planted Teff but it dried" (V1-IIR-2). In the midland areas, such as the second study village, *belg* production is more or less becoming a thing of the past. One of the respondents noted;

"This time is called *gimsha*, it was supposed to rain and we would start ploughing. The cows would give a lot of milk. We used to have *belg* production. Now there is nothing. Now let alone *belg* production, we do not even have fodder for our livestock. They used to graze fresh grass at this time. This time we were also supposed to be done with the *meher* season ploughing, but now we have not even started yet. We still

plant *belg* at times, but we get pretty much nothing” (V2-FGD-1).

The main production season, *meher*, is also under pressure because of two climate related challenges. The first is because of the high fluctuation of the *belg* season, land preparation and sowing times of sorghum and millet crop production is suffering. Under normal conditions, the land for these crops is supposed to be prepared sometime in the months of February or March. If the *belg* rains are poor, one could also prepare land and sow the seeds in April, or in the most delayed cases, land could be prepared in April and seeds would be sown in May. With the fluctuation of the *belg* rainfall, this cropping calendar has been disturbed. Hence, in the worst-case scenario, if the *belg* rainfall disappears all together or is not enough, farmers would plant teff, wheat or barley instead of sorghum and millet. For example, if they have already planted the seeds in April, the seeds germinate, and it rains again in May, they have to replant it. This is because in sorghum production, once the seeds germinated, it cannot have rain until it reaches knee height. Hence, farmers had to replant, sometimes up to three and four times until the rainfall withdraws completely.

The second important challenge with regard to the main production season is related to the early termination of rainfall. Many of the respondents argued that this is more critical than the rainfall fluctuation in April and May because while these fluctuations determines what farmers can plant, a pre-mature secession of the rainfall has consequences for the production and productivity of any crop that is planted. Without good rains during the seed setting stage, all the effort and investment that went into the production is essentially wasted. The following quotations support this argument.

“This year, if we get rain in September with God’s will, the harvest will be nice. If we don’t get rain in September, all our effort will be in vain. Last year we planted teff and wheat in July. But as I told you the rains stopped at the end of August, during the seeding stage. The crops suffer a lot” (V1-IIR-11).

“It usually rains well during early stages of the crop life, but when it reaches to the time of flowering and seed setting, the rain stops. The last two years, that was what happened, and we harvested so little because of that. The sun during this time is so strong and if it does not rain, the crop wilts and productivity decreases significantly” (V2-FGD-1).

“My crop stand was very good until the time of flowering stage came. During that time, the rain was not enough; there was not enough rain during the flowering stage. I only managed to harvest a very meagre amount of teff” (V4-IIR-4).

These climate related risks pose serious livelihood challenges for farmers. One can add minor droughts that occur every two or three years and serious droughts that usually visit these areas every ten years or so. Climate risks pose a serious risk of moisture stress that could reduce crop production and even cause total crop failure depending on its severity. Nevertheless, this should not obscure the role of other risk settings that threaten the livelihoods of farmers. It is through an interaction of different risk settings that livelihood risks emerge. In the paragraphs that follow, the interactions of the risk settings in each study site will be analysed in order to show the uniqueness of each place in producing different overlaps of risks that eventually threaten farmers’ livelihoods.

In the first study village, the undulating topography of the village causes serious erosion and flooding problems. In fact, during the fieldwork for this study, a flood heavily damaged the farm plots of 20 families. Conflict among farmers along the catchment is common due to floodwater management failures, where by some farmers do not properly drain excess run off water from their farm. This aggravates the degradation of farm plots and reduces crop production. The village also has a high population density, with the average farmland per household at only 0.25 ha. As a result, many of the rural youth in the village are landless. Although around a quarter of the village households has access to irrigation, they face fluctuating prices for their produce. On top of these risk settings, one could add crop failures due to inappropriate agricultural technologies introduced by the government into the village. These technologies include: poor performing seeds and forced fertilizer use which can burn crops when there is not enough rain during seed bearing stage. Additionally, there was also a failure of the political leadership and village experts to mobilize farmers to take up improved technologies that arrest soil degradation, improve soil moisture, and increase crop productivity and production. While some of the source risks are within the village, others have their sources outside of the village. Some of these risk do not location specific sources. For example, risks such as, market price volatility, lack of access to improved agricultural technologies, and the absence of viable livelihood options cannot be traced to a specific location and are caused by factors well beyond the control of the residents of the village.

Typically farmers in this village have small farm plots. The plots are often in a sloppy area, subjected to erosion and run-off. Hence, the fertility of these plots is often poor. As a result, these farmers are forced to use improved seeds and fertilizer by government agents. However, both of these technologies require proper moisture, especially during critical stages of the crop growth cycle. Hence, even a small variation in the weather, especially with regard to rainfall, could disrupt the livelihood of farmers in the village significantly.

In study village two, climate related risks are still prominent. The area is closer to the lowlands; hence, it suffers from moisture stress for most part of the year. There were two unique risk settings in this village. The first is that the village has high number of livestock with free grazing production system. The villagers claim that their ancestor used to be pastoralists like the Afar people. As a result, from the time the *meher* season crops are harvested and until the next production season, livestock are allowed to graze freely. This makes it practically impossible to plant *belg* crops even when it rains. This culture also causes serious problem for the newly started irrigation scheme in the village, as it is difficult and costly to protect irrigation fields from damage caused by livestock. The second risk setting unique for this village was related to loss of livelihood from remittance from migrant youth. This village has a number high number of young migrants travelling to Saudi Arabia. However, a recent crackdown on illegal migrants in Saudi Arabia left many the youth from the village to return home. The situation was described during one of the FGDs as follows;

“Many of the youth with no land to plough went to Arab countries. Now many of them are back again. We have no idea what to do with them. We are in a serious social crisis. Fathers and sons are quarrelling. When the returnees finish the money they brought when they were back, we will have serious trouble. Already, theft is getting to be a serious problem” (V2-FGD-1).

Accordingly, similar to the previous village, the livelihood of the people in this village was “at risk” because of multiple risk settings from different sources within and outside the village. A typical farmer in the village has a relatively bigger land size, compared to the first village. However, the farm plots are often fragmented and one farmer could have three plots in three different places, which makes it difficult to manage. The area is also adjacent to the lowland area, which makes it extremely dry. Despite the dry nature of the area, government experts often force farmers to use technologies such as improved seeds and fertilizer, which often fail when the rains disappear during the seed setting stage.

The third and the fourth study villages, Aradome and Addiskign are quite similar due to the homogeneity of their culture, climate and livelihood activities. Both villages are found in the lowlands of the Kobo-Girana valley. There are unique risk settings which define these villages apart from their semi-arid environmental condition. First, unlike the other two villages, the rainfalls in July and August are critical in these villages. For the other villages, it is more or less certain that the July and August rainfalls are insufficient for growing crops. However even in study village three and four, the July and August rainfall are failing with respondents noting that this failure occurs roughly once in three years. Second, Raya farmers, which includes both villages, depend on floodwater from the highlands to supplement their crop production in the drylands. Recently however, in both villages floodwaters are diminishing. People noted that this is mainly due to an increased use of water in the upper catchments and a natural diversion of the river's direction, which used to flood the villages. For farms with no access to irrigation, this is a serious threat.

Third, because of lack of access to river and ground waters as well as the high physical vulnerability of the area without supplemental irrigation, the government invested significantly in developing irrigation facilities in both villages. While farmers appreciate these investments, it comes at a cost. The government considers these areas to be growth corridors of the region. Accordingly, farmers are expected to use the improved technologies and produce for the market. This is not an easy thing to do for resource poor farmers who do not have the financial capacity to invest in their farms and cannot take the risk of market failure. As a result, many resource poor farmers are forced to rent out or even give up their land for sharecropping.

A typical farmer in these two villages and mainly in the third study village would have one or two farm plots that has access to irrigation. Land size is also relatively larger in these villages when compared to the first village. However, these farmers often prefer to produce for their own subsistence and to use their own production technologies. This brings them into conflict with the government, as it requires them to produce for the market and use government approved production technologies.

In summary, the five risk settings identified interact in various ways in the four study villages, producing unique livelihood risks in each village. Accordingly, similar weather conditions in a particular year can produce different impacts in different villages. It is also important to

note that sometimes well-meaning government interventions that are introduced to a community in order to tackle climate risks and promote local development can interact with existing risk settings in the villages and produce negative results. In fact, this is what occurs more often than not. Hence, adaptation interventions in such a context need to be comprehensive enough to be able to capture as many of the risk settings identified as possible. Interventions also need to be mindful of their unintended maladaptive dimensions which can jeopardize the livelihoods of farmers by interacting with other risk settings in an area.

4.5 Managing climate risks

The previous sections looked at the various nature of risks and riskscapes of the four study villages. It has been shown that the differences between the villages are due to both the material as well as the cultural conditions of the study areas. The focus on riskscapes opens the discussion to considering the multiplicity of the construction of the sources of risks. As Müller-Mahn and Everts (2013) noted, riskscapes are produced both by expert practices and the everyday practices of local communities. Different riskscapes also produce different risk management practices. This section explores, in brief, the risk management practices of local communities and the state for climate related riskscapes. Here again, the risk management practices are separated by study villages, as the practices are determined by the material and cultural conditions of the specific areas.

In the first study village, the main climate related risk settings identified are: soil erosion and flooding due to the undulating topography of the village, variability of the *belg* rainfall, and fluctuation in the *meher* rainfall mainly during the flowering and seed setting stages of crop production cycle. Accordingly, the risk management practices observed include: soil and water conservation practices, irrigation, and adjustments in crop production practices. The soil and water conservation practices involve mainly stone bunds on farm plots, a common traditional practice that is supported by experts. Despite many years of experience in soil and water conservation practices, the sloped nature of the landscape hinders actual soil and water conservation. Soil erosion and flooding, on both farm plots and communal grazing areas remain major challenges for the village. Despite the availability of a river that crosses the village year round, the topography of the village has made it difficult to irrigate the majority of the village farms. Adjustments in crop production techniques include: planting crops with a short growing period such as teff, wheat or barley, land preparation and planting with

available moisture, sowing by soaking sorghum seeds in water, conserving moisture in the soil, using early maturing crop varieties, and the repeated ploughing of farms.



(Source: Own photo taken during field work)

Figure 11: Traditional stone buds at study village one

In study village two, the topography of the village is more or less flat. Hence, the major climate related risks are related to rainfall variability for both *belg* and *meher* rain seasons. Since the village has a large number of livestock, fodder shortage is also a serious issue. Risk management practices in this village also depend on material and cultural features of the village. Farmers with farmlands close to the river crossing the village have access to irrigation water. However, the performance of the irrigation system in the village was weak because of a number of other risks associated with it. First, the irrigation diversion from the river was made with locally available material and experienced repeated damage from heavy floods. Hence, farmers complain that they lose their investment repeatedly. Second, the free grazing culture made the controlling of irrigated land labour intensive and costly. Third, although there have been a recent changes, remittances from villagers working in Arab countries makes farming less attractive for many families. Hence, it was easy to find many potentially irrigable land plots left idle as families feel that it is too tiresome to clear the fields and produce using irrigation. Economic use of livestock fodder and income diversification mainly through trade was also mentioned as an important risk management strategy.

A few model farmers, some supported by donor funded soil and water conservation projects and some not, managed to conserve soil moisture and water on their farm and produce fruits

and vegetables, showcasing the possibility of tackling moisture stress in their semi-arid environment. However, what was peculiar about the first and second village was that except for activities initiated by the government, self-initiated collective climate risk and resource management practices were lacking. This is despite the apparent immediate benefits that could be made through such practices as collective flood diversion in the first study village and collective livestock grazing management in the second study villages would have benefited many.

Fruit trees grown using water conservation techniques



Backyard coffee production using water harvesting technology



(Source: Own photo taken during field work)

Figure 12: Model farmers from study village two

The third and fourth study villages share some risk management practices. Unlike the other two villages, these villages have self-organized collective climate risk and natural resource management practices. The villages have traditional self-help associations called *Kires*, which serve multiple functions, including: the organization of collective action for flood diversion for both crop production and livestock watering, the maintenance of livestock enclosure for dry season grazing, and the protection of village trees from unlawful cutting. For resource management related collective actions, the *kires* are divided into small groups with a leader called an *abahaga*. *Abahagas* typically have 20-30 farmers subordinate to them. The *abahaga* divides the farmers in his group into sub-groups of five to six members. The small groups are usually formed with farmers that have adjacent farmland. They do flood diversion both for livestock drinking and crop production in their farm collectively and they also manage natural resource such as enclosures.

The *kires* use strict social control mechanisms. Absenteeism in collective works is

punishable. Penalties usually take the form of fines, which are imposed and collected by the *abahagas*. The penalty collected is used either to buy items for the *kire* or throwing a feast for the *abahagas*. In the event that absentees fail to pay their penalty, they are sent to the *kire* elders who impose more severe penalties. In exceptional cases, if the person fails to pay his/her due, a general community meeting is called and the person is outcast from any form of community life. Any relationship with such a person is considered treason against the community. These elaborate social control mechanisms made the customary institutions effective in mobilizing local communities for collective actions. An example of the effectiveness of the customary institution in managing an enclosure is found in the following quotation;

“Look at these trees; they have been kept because we assigned local leaders to protect them. These trees were planted in 1974. When the campaigning students from the socialist regime came here during the “development through collectivization” campaign, we told them that we wanted to keep our trees and we instituted leaders to control deforestation. Since then, the trees have been kept. When people are found guilty of cutting trees, they face a penalty. The dues paid as penalties go to a local self-help organization. Even when you have a tree cut in front of your house, you will be asked for your reason. Right now, as you can see here, we have a funeral. The family needed wood for the funeral and they requested for permission to cut some tree from the local leader and they were allowed” (V3-Ob-1).

Trees protected by customary institution, [Aradom](#)



Water pond managed by customary institution, [Addis Kign](#)



(Source: Own photo taken during field work)

Figure 13: Natural resources managed by customary institutions

A few points are worth mentioning here. First, not all these risk management practices are equally available for all. For example, taking advantage of the early rains and planting early is not possible for poor farmers who have to borrow oxen to plough their land. Soaking seeds with water and planting requires access to water and hence is not an option for those who live at the upper catchment of the village. Repeated ploughing also requires access to labour and oxen, which the poor cannot easily access. Second, both the state and local communities play a role in carrying out the risk management practices. Third, other non-farm related practices are also used in worst-case scenarios, such as labour migration, reducing basic consumption patterns and food aid.

The collective risk management practices in the third and fourth village also had their own limits. The practices targeted activities that have communal value and limited jurisdiction. For example, with the village tree protection program, only the trees within a certain radius are protected, leaving other trees outside this radius exposed for deforestation. Additionally, some of the resource management issues which requires inter village collaboration are not facilitated by customary institutions as these institutions tend to function within a limited boundary.

In sum, the farmers in the study villages are not passive victims of climate risks. They actively engage themselves to climate risk management practices either in private or collectively with their neighbours. However, not all farmers have an equal ability to manage risks. Farmers that are poor, female or elderly often have limited material and social capital to manage the resources needed for managing climate risks. The limitations of local risk management practices are apparent in the livelihood conditions of the study villages. The study villages are among the poorest in the country, and many of the residents in these villages have to rely on government food aid handouts. It was also observed during the fieldwork that there were some risk management activities that could have been implemented by the local communities but were not because of a lack of action coordination among community members. However, some of the villages including the third and fourth study villages have high potential for crop production, which means that the government intends to use them as a growth corridor. Hence, both climate risk management and development were at the heart of government led interventions in these two villages. This is in contrast with the first two villages where the development interventions were mainly targeted at climate risk management.

4.6 Interim Conclusion

This chapter addresses the first research question: “What social, economic, political and ecological sources of livelihood risks are identified by state and community actors and how do these sources interact to produce livelihood risks in the study areas?” The aim of asking this question is to set the scene for the next chapters which also aim to assess adaptation interventions. In this regard, based on the above discussions, three interrelated conclusions are made.

First, the core livelihood risks facing local communities in the study areas are food insecurity and poverty. These are referred to as “core risks” because they are a result of other intermediary risks such as moisture stress, drought, degradation, and shrinking income. Identification of these core risks is important as the ultimate outcome of any successful risk management intervention is to improve food security and livelihood conditions of local communities. As it will be seen in sections 5.5 and 6.5, local communities tend to measure success on these concrete outcomes, as opposed to experts and local politicians who might stop at intermediate outcomes. For example, while state experts focus on halting land degradation and mobilizing communities for conservation work, local communities challenge these interventions when they do not see immediate livelihood benefits.

Second, the riskscape of food insecurity and poverty are multiple, with experts and local communities attributing overlapping and conflicting risk framing to an area (Müller-Mahn and Everts 2013; O'Brien and Wolf 2010). Hence, the identified risk settings have both material and discursive components. This has important implications for adaptation interventions. As will be indicated in sections 5.2 and 6.4, the watershed development and irrigation management interventions are linked with the particular riskscape of state experts and local communities.

Third, livelihood risks are produced by the overlap and interaction of multiple risk settings in an area (Marino and Ribot 2012). Here again, climate risks are important, but they are not the only ones. Both natural and social sources of risks can interact in exerting stress on agricultural production, consumption and prices. This insight is used to assess the ways the case study interventions address the interaction of climate and non-climate stresses. First, as sections 5.4 and 6.4 will show, the very interventions that are aimed at improving the livelihoods of local communities can also add additional burdens on farmers and thus create

new livelihood risks, which can lead to various forms of resistance (cf. section 5.4.3, 6.4.3). Second, the interventions only addressed part of the risk settings that put people's livelihoods at risk, hence failing to improve significantly people's livelihood as they promised. In this regard, the irrigation management intervention was better than the watershed management intervention as the former has immediate livelihood outcomes compared with the latter (c.f. Section 5.5, 6.5).

Given these vulnerability and risk management contexts, the pertinent questions that the chapters to follow should answer include:

- To what extent do the interventions studied address the risk settings identified in this chapter
- How were differences in the riskscapes of experts and local communities reflected during the implementation processes of the interventions studied and to what effect?
- In what way do the interventions address climate risks and their interaction with non-climate risks?
- What are the opportunities and constraints for transformative adaptation in the study areas?

Chapter Five

Adaptation Action Coordination: The case of watershed development

5.1 Introduction

This chapter presents the first case study on watershed management. The case selected is the Ethiopian Integrated Natural Resource Management Program. It is a nationwide program of rehabilitating degraded watersheds with soil and water conservation measures, enclosing degraded hillsides, afforestation, and water harvesting. As we will see in the discussions that follow, things are not as integrated as the name of the program implies. As a result, the focus of this study is on the main component of the program, the annual watershed development campaigns where soil and water conservation as well as hillside enclosures are the main components. These activities are not new to Ethiopia, there have been similar interventions implemented by the last three governments for close to half a century in response to recurrent drought and land degradation. One core question that worth asking is then, ‘why do such long overdue and expensive interventions fail to bring about significant change in tackling drought and land degradation?’ (Scott 1998; Li 2005) The same interventions are being promoted by the current government of Ethiopia as the main adaptation actions against climate change impacts in rural areas (FDRE 2015). It is important to ask what lessons have been taken from past failures. Are the current interventions that have been implemented for the past few years helping farmers to deal with climate related risks and land degradation? Could these interventions maintain their utility in the years to come?

Most previous studies saw the sources of failures of soil and water conservation methods either in agency of farmers or in structural issues. The agency related issues that are often cited are the age, educational status, labour availability and other assets of the farmers. The structure related issues that re often cited include land tenure insecurity and market failure (Pender and Gebremedhin 2007; Bewket 2007). Such framing of these problems associated with past and current interventions overlooks the processes dimensions of these interventions. Even when studies identify top-down approaches as reasons for failure, they do not often explain the ways in which policy ideas travel from the top to the bottom. Nor do they explain the interaction of policy ideas in local contexts. They also fail to explain how local communities respond to such interventions in the context of their everyday life.

This chapter aims at addressing the second research question: “In what ways are actions for adaptation coordinated among the state and local communities and how does this coordination influences the effectiveness of adaptation actions?” In this chapter, the study explores the research question using the case study of watershed development campaigns in Ethiopia. Accordingly, the chapter is organized into six sections. Section 5.2 historicizes the nexus of natural resource management and climate risk management in Ethiopia by tracing the historical trajectories of natural resource based interventions in Ethiopia beginning with the droughts of the mid 1970’s and 1980’s. Section 5.3 provides an analysis of the status of the watershed development work in the study areas. Section 5.4 presents the government’s use of hegemonic ‘developmental state’ ideology and different forms of governmentality projects as a containment strategy in order to ensure the cooperation of local communities with the watershed development intervention. This section also explores the counter containment strategies of local communities against the influences of the state. This includes exploring both covert and overt means of resistance. The final part of the section looks at convergence of the interest of the state and local communities, in what is referred to as the development of environmentality (Agrawal 2005). Section 5.5 considers the above discussion and explores the implications of the watershed intervention for adaptation with to climate risks. Section 5.6 gives the interim conclusions of the chapter.

5.2 Historicizing the resource management-adaptation nexus in Ethiopia

Before delving into the historical perspectives on the nexus of natural resource management and climate risk management in Ethiopia, it makes sense to set the global context. What is the broader framing of the resource management and adaptation nexus globally? To answer this, one could look into a recent IPCC report and link it with other debates in the areas of desertification and land degradation. The fifth assessment report of the IPCC identified experiences in ecosystem services, biodiversity and natural resource management as an essential springboard for an ecologically sound and effective adaptation strategy for Africa. It states that the natural resource oriented adaptation options build on many years of experiences in natural resource management practices (Niang et al. 2014:1233). These experiences are the result of the worldwide responses to the droughts and famines of the mid 1960’s and 1970’s. By then, these disasters were believed to be caused by desertification (D’Odorico et al. 2013).

The debate on desertification has evolved significantly, mainly through changes in scientific understanding of ecological processes and criticisms from the social science community. The scientific explanation of desertification shifted the cause of desertification from the more local phenomenon of land degradation to rainfall variability caused by global climate change (Herrmann and Hutchinson 2005; Reynolds et al. 2007; D’Odorico et al. 2013). Social science also challenged the narrative of desertification that blames subsistence farmers and pastoralists for land degradation (Herrmann and Hutchinson 2005). These studies revealed that the multifaceted, proactive and complex traditional resource management practices of local communities along discursive structural forces often push local communities into irrational resource use (Blaikie 1985; Biot et al. 1995; Forsyth 2003).

Following the paradigm shifts in desertification and land degradation, a natural resource management approach which views resource users as responsible and willing to manage their resources emerged over time, under the umbrella concept of “community based natural resource management” (CBNRM) (Leach, Mearns, and Scoones 1999). However, criticisms soon mounted against the romanticism of community based approaches and indigenous knowledge as interventions targeted at promoting these approaches failed to deliver their promises (Blaikie 2006). This led to a refinement of the natural resource management (NRM) approach in order to create a hybrid approach which integrates political, expert and local community interests (Blaikie 2006; Mansuri and Rao 2004; Leach, Mearns, and Scoones 1997).

These paradigm shifts in NRM are important for the current adaptation debate. NRM remains as important component of climate change adaptation in the African context (Uy and Shaw 2012). Niang et al. (2014:1234), in the IPCC fifth assessment report stated, “Natural resource management practices that improve ecosystem resilience can serve as proactive, low-regret adaptation strategies for vulnerable livelihoods.” Accordingly there is an increasing body of literature which links community based natural resource management, adaptive management and adaptive co-management of natural resources with climate change adaptation (Plummer and Baird 2013; Tompkins and Adger 2004; Plummer 2013; Niang et al. 2014).

Similar trends are observed in Ethiopia as well. NRM interventions, such as watershed development are often cited as essential adaptation and mitigation measures against climate change (Chisholm and Tassew 2012). This is the result of long standing soil and land

degradation narratives in Ethiopia. At the national level, the estimates of soil loss due to erosion show that half of the highlands of Ethiopia are significantly eroded. It is estimated that the total annual soil loss is 1.9 billion tons of top soil per year with 80% of this loss coming from croplands (Mekonnen et al. 2007). This was assumed to be the core driver of the famine of the 1970's and 1980's. The narrative that developed out of this experience blames farmers and their backwards practices as the prime drivers of degradation (Dessalegn 2003; Admassie 2000). Although it does not account for the land use changes that have occurred since the 1980's, this anti-farmer narrative is still influential in terms of guiding national policy for natural resource management interventions (See for example, Hurni et al. (2010) ,Nyssen et al. (2004) , Alemneh (2003)). This raises the question of why this narrative still persists and how has this narrative been informing decision making on halting soil and land degradation?

Part of the reason for the persistence of this narrative is because of its apolitical framing of the land degradation issue and its solution. This narrative considers smallholder farmers and their traditional farming practices to be the prime drivers of soil erosion and land degradation. In fact, Hans Hurni, an influential figure in soil and water conservation research in Ethiopia since the 1980's, together with his team stated "Ethiopian farmers do not perceive soil degradation to be a problem for agriculture, let alone a life threatening issue affecting the productivity of the soil" (Hurni et al. 2010: 196). They argue that this mind-set is evident in slow adoption of soil conservation measures and the failure of farmers to understand the importance of sustainably using their soil (ibid). This narrative added to other narratives such as population growth, deforestation and lack of farm innovation which squarely blames farmers as drivers of the destruction of their own environment (Crummey and Winter-Nelson 2003). Such a narrative finds acceptance among policy makers as it relieves them from taking responsibility for their actions and enables them to legitimize developmental interventions (Keeley and Scoones 2000).

Additionally, this narrative promises that if the issue of soil erosion is addressed, it could translate into livelihood benefits and alleviate poverty (see for example Nyssen et al. (2004) and Alemneh (2003)). This makes it appealing for policy makers who consider poverty to be an existential threat to Ethiopia and are looking for quick technical fixes. Such framings of land degradation and its solution have been well accepted by successive governments as the main source of legitimation for heavy state intervention. For example, the military Derg

regime used land degradation to legitimize large scale resettlement and tree planting programs in famine stricken areas of the then Wollo province (Crummey and Winter-Nelson 2003). It also used its ownership of land to fence off hillsides for enclosure in the name of environmental conservation, thus denying farmers access to critical livelihood resources (ibid).

In the 1980's, the state's sense of environmentalism was often concerned with halting erosion or rehabilitating the natural environment, which leads to "restrictive and exclusionist" conservationist strategies (Dessalegn 2003: 209). This stands in contrast to peasant's environmentalism which sees environmentalism as a mechanism to secure a better livelihood (ibid). Dessalegn (2003) further argued that in the 1980's the environmentalism of the state and foreign experts considered neo-Malthusian population pressure and backward destructive farm practices as the main drivers of degradation. This was used to justify collective farming programs and mass mobilization for conservation work by the socialist military regime.

In the early 1990's, the political atmosphere changed significantly with the ousting of the military regime by EPRDF. The international debate on the environment also put its mark during this time. The focus on conservation strategies continued, although its link with food aid increasingly faded away. The coercive top down approach gave way to more spaces for citizen's participation and consultation. This was partly a result of the large-scale destruction of soil and water conservation (SWC) structures constructed during the military regime. However, the major environmental crisis narrative continued. For example, renowned experts in the field such as Nyssen et al. (2004) argued that degradation is an eminent threat in Ethiopia, causing desertification. They also argued that a strong-handed state wielding both sticks and carrots is essential in Ethiopian case since private investment in soil and water conservation is unlikely to warrant voluntary engagement by rural communities. This, they argued, worked well in Ethiopia even during the autocratic military regime by enabling environmental rehabilitation. With this in mind Keeley and Scoones (2000; 2004) summed it up by saying that the EPRDF approach still maintains the environmental crisis and conservationist approaches, justifying strong state intervention in rural areas.

The current narrative posits soil and water conservation as one of the important climate change risk management strategies for Ethiopia (Habtamu et al. 2013, 2013; Kato et al. 2009; World Bank 2007). For example, the study of Kato et al. (2009) claimed that over all, soil

and water conservation technologies introduced in the past showed a significant positive effect on crop production. However, they also found that the risk reducing effects of different technologies were different under different ecological conditions. The study of Kassie et al. (2008) also indicated the importance of stone bunds in reducing moisture stress in mainly semi-arid areas. Pender and Gebremedhin (2007) also reported that stone terraces increase both crop production and the impact of inorganic fertilizer.

Despite these positive appraisals of soil and water conservation measures, some highlight the limits of these approaches in halting land degradation. For example, Hurni et al. (2010) noted the importance of integrating sustainable land management practices with broader social and economic issues such as the transition from agriculture to secondary and tertiary sectors as well as land tenure, health, and education issues in order to ensure a positive impact on Ethiopian development. The World Bank (2007) also noted that soil and water conservation interventions in Ethiopia tend to treat the construction of physical structures as a panacea to degradation. It argues that without integrating physical structures with soil fertility and soil moisture management practices, the physical structures are not enough. Furthermore, it argues, that the sustainability of soil and water conservation interventions lays on their ability to improve people's livelihood and develop a sense of ownership through genuine participation (ibid).

To sum up, the current narrative on the link between natural resource management and climate risk management in Ethiopian context is a result of the historical experience in dealing with drought and land degradation. It involves a number of local, national and global actors. The overall framing of land degradation has a neo-Malthusian nature, with a strong focus on blaming traditional farming practices as the driver of degradation. Successive governments to legitimize their interventions have effectively used these narratives. As a result, these governments put natural resource management at the centre of their development policies. Currently, resource management is getting even more traction as it is increasingly linked to climate change adaptation and mitigation. In the section to follow, we will look at the status of state-led watershed development interventions at different levels.

5.3 The status of watershed development interventions in Ethiopia

The Ethiopian Integrated Natural Resource Management Program is a multi-year government led program currently under implementation nationally in all regions. Nationally the program is supported by multiple donor agencies, including the World Bank, The GIZ, KfW, CIDA and the Finish Government under the Sustainable Land Management (SLM) program. The first phase of SLM (SLM I) was between 2008 and 2013 and the second phase (SLM II) has been underway since 2014 and will continue until 2019. While SLM-I was operational in three regions, namely Amhara, Tigray and Oromia regions, SLM II is operational in an additional three regions, namely Benishangul-Gumz, Gambella and Southern Nations, Nationalities and Peoples' Regions (SNNPR). Because of the sheer size of the intervention, there is no coherent data on what has been achieved so far.

The focus of this study is the national natural resource management program undertaken during the growth and transformation plan (GTP) period (2010/11-2014/15). This program is different from previous similar initiatives in two ways. First, unlike other initiatives, the natural resource development and management program was part of a broader integrated agricultural and rural development initiative and it carried a particular mission of developing the natural resource base to improve rural livelihoods (MoFED 2010).

Second, the program is a national program, implemented in all the regions. Although there were some differences among different regions, there has been a tendency toward standardizing work performance. The National Guideline on Community Based Participatory Natural Resource Management provides the overarching work standard in all the regions (Lakew et al. 2005).

At least within regions, there is strong standardization. For example, in Amhara Region, the watershed development work has been done for two to three months every year during the GTP period facilitated through campaign-based public mobilizations. The public mobilization campaigns are often designed to begin and end at the same time in all the villages in a region. Work performance standards are also set at regional level. Accordingly, at least in principle, each village is expected to organize 80-100% of all their residents aged 16-65 to work for 60 days excluding holidays. Each day villagers are expected to work eight hours per day. The

amount of work expected from each individual according to the type of work has also been calculated and communicated. This standardization makes it easier to monitor and compare performances across different scales and locations. As we will see in the subsequent section, however, it has also created a tension between experts who try to stick to the standards set from above and local communities who demand contextualizing the work to their day-to-day circumstances.

Looking at the aggregate coverage of the national level work over the last five years, according to information obtained from Ministry of Agriculture (MoA 2014), one can observe that 16 million ha of land was treated with different soil and water conservation structures in 19,807 micro watersheds during the four years of the GTP period (2010/11-2014/15). In terms of average annual performance, this means that there was treatment of more than 4 million ha per year. With the same calculation, the five year national performance comes out to over 20 million ha of land, which is well over 16% of the nation geographical area.

When looking at the regional level, in Amhara Regional State, data obtained from the regional Agriculture Office indicates that the integrated natural resource program constructed physical soil and water conservation structures on 3.83 million ha of farm and communal land terraces, 1,500, 252 ha of enclosure on degraded hillsides and 50468 ha of gully treatment between the years 2010 and 2013. That would mean that over six million ha of farmland and 2.5 million hillsides were treated with soil and water conservation interventions in the region by the end of the GTP period (See table).

Description	Planned	Coverage	Performance
Total area of farm and grazing land	4.5 million ha	3.83 million ha	85%
Degraded hillsides with over 50% slope	2,165,604 million ha	1,500,252 million (enclosures)	70%
Gully	182, 080 ha	50468 ha	25%

Source: Amhara Region Bureau of Agriculture, 2013

Table 2: Planned and performance of integrated natural resource management in Amhara Region, 2010-2013

At the zonal level, data obtained from the North Wollo zone agricultural office indicates that over the five year GTP period, a total of 150,933 ha of land was treated with farm terraces, 157,445.8 ha received hillside terraces, over 20 million m³ of trenches were built, 147,047 ha

of enclosures were built and over 20 million seedlings were distributed. A feedback report sent to the districts of the zone shows that in 2013/14, around 16.6 million rural residents of the zone were organized for the work and the total turnout was a little over 14.4 million which was 87 % of the organized labour force of the zone. In Gubalafto district, 154 micro watersheds were treated with 30,840 ha of farm terraces, close to 5 million moisture conservation structures, over 1.6 million m³ of trenches, and over 13 million seedlings. A feedback report from the district shows that in 2013/14 a total of a little over 1.9 million rural residents in the district were organized for the work and the total turnout was a little over 1.6 million, 91 % of the organized labour force. These figures might not be accurate for many political and technical reasons, but they show the significance of the natural resource intervention in terms of its coverage. If successful, the intervention has the capacity to transform a huge part of the landscape of Ethiopia.

It was difficult to estimate the work done during the GTP period at the village level since comprehensive data was not available. The performance estimates for the five-year period were calculated by extrapolating the available data, hence it is only indicative and cannot give a full picture. Accordingly, according to data obtained from the village Farmers Training Centre of the first study village, 2076 male and 1414 female members of the village were organized for watershed development work. An 8-day report by the district in 2013/14 watershed campaign period showed that only 96.28 % of the labour force was organized for the campaign, giving it a rank of 8th in the district. In terms of work performance, 350km of hillside terrace, 1,095km of farm terraces, 6347m³ of trenches and 41,110 moisture harvesting and water conservation structures were constructed over the five year GTP period. A feedback report from the district agricultural office shows that labour wastage in this village was 49%. This was calculated using a one-day sample of the amount of farm terraces completed divided by the number of labourers involved and comparing this with standard in the guideline.

For village 2, according to data obtained from the village, 811 men and 600 women, members of the village were organized for the watershed development work. An eight day report by the district showed that only 48% of the labour force was organized, giving it a rank of 34th in the district. Most of the work was on farm terraces. Accordingly, over the five years period an estimated 350 km of farm terraces, 28 ha of gully treatment, 3,500m³ of trenches were constructed in two micro-watersheds in the village. Labour wastage in this village was 70%.

Description of activities	Unit	Five year plan	Performance					5 year	%	
			2010	2011	2012	2013	2014			
Soil and moisture conservation structures	On farm	K.m	130282.1	14344.85	16676.4	32963	34122.25	40507.6	98106.5	75.30
	terraces	Ha	200,434	22068.9	25656	50712.33	5249.,77	56646	150,933	75.30
	Hillside	k.m	114473	18778	20558	18974,01	15791,99	4620,9	157445.8	137.53
	terraces	Ha	114473	18778	20558	18974,01	15791,99	4620,9	157445.8	137.53
	Trenches	Ha	46691	2779.9	645	9937,13	517,97	1173,6	30107.2	64.49
		M ³	70036500	4169850	967500	14905500	776961.1	1203025	20819811	29.72
	Table	k.m					93.03	67.9	93.03	
terrace	ha					303.98	299.1	303.98		
Area enclosure	ha	107844	36419	53582.3	25472.64	32473.06	44289	147947	137.19	
Forestry activities	Seedling production	No. million	1766.72	200.16	207	255,7	293.33	NA	2722.91	154.12
	Seedling plantation	No. million	1692.2	179.91	184.19	240	262.1	NA	2558.4	151.19
	Area covered with seedling	ha	249459.3	96532	23788.5	19651.42	53285.5	NA	442716.7	177.47
	Seedlings survived	No. million		144	100.7	123.7	0	NA	368,4	
	Forest cover	%		9.22	9.45	10.44	0	NA	29,11	

Source: North Wollo Administration Agriculture Office, 2015

Table 3: Planned and performance of integrated natural resource management in North Wollo Administrative Zone, 2010-2014

Description of activities		Unit	Performance					Total
			2010	2011	2012	2013	2014	
Number of watersheds treated		No	111	73	72	72	75	
Soil and water conservation structures	On farm terraces	Ha	5000	4354	7250	5941.9	8295.1	30,841
	Moisture conservation structures	No. million	1.19	0.89	0.81	1.93	0.17	4.99
	Trenches	M ³	550632	353654	260000	232541	205602	1,602,429
Forestry activities	Seedling plantation	No. million	25	24.07	30.52	35.44	NA	115.03
	Seedlings survived	Ha	3029.2	2725.14	4073.5	4114.9	NA	13,942
	Seedlings survived	No. million	14.5	18.9	23.22	33.7	NA	90.32
	Forest cover of the district	Ha	2896	2510	3752	4051	NA	13,209
	Forest cover of the district	%	10.06	11.52	12.72	14.22	NA	48.52

Source: Gubalafto District Agriculture Office, 2015

Table 4: Five years performance of natural resource development, Gubalafto DIstrict

In summary, both at national and local levels, the coverage of the watershed development intervention was huge. The achievements gave the Ethiopian government positive credit from the international community. Some compared these achievements with the famines of the 1970's and 1980's and claimed that Ethiopia is food secure and greener than 140 years ago (Reij 2015). It is also important to note that, although the aggregate figures were indicative, there was a significant difference in performance between the first and second study villages. These observations open up more questions for the subsequent sections, such as, what can explain the difference in performance between the two study villages? To what extent can it be said that the watershed development work contributed to food security and livelihood improvements of rural people in Ethiopia? These are the points that will be addressed in the coming sections.

5.4 Forcing people or fostering cooperation? The politics of people mobilization for watershed development campaigns

The previous sections showed us that adaptation with climate risks in Ethiopian context is strongly related to managing natural resources. As smallholder farmers are heavily involved in managing and using natural resources, past and current interventions on resource management focus on mobilizing rural communities for this same cause. Past experiences have showed us that the state remains active in resource management ventures for the purposes of controlling the rural and agricultural sector. This makes natural resource management activities in Ethiopia a collaborative endeavour between the state and the people.

However, the collaboration is not between equals. The state has the political and economic capital to control and direct people. This puts the state in a position to use its power to coerce rural communities into its developmental projects. The communities, however, also have their own power to resist and derail state interventions that do not reflect their interests (Few 2001). Hence, understanding adaptation processes in the Ethiopian context requires understanding the complexity of the state-society relationship, mainly the way that the state manages its developmental agenda and the response of the people. This section presents an analysis of the political process of the state intervention in watershed development. It explores the political strategies that the government uses to enlist rural communities in the watershed development program without using authoritarian tactics. The first part explores the two containment strategies of the state, hegemony and governmentality, to control local communities and direct them towards a pre-determined developmental agenda. The second part looks at the overt and covert counter-containment strategies of the people against state interventions that are counter to their interests. The third part presents the convergence of state and local communities interests and aspirations.

5.4.1 Hegemony as a containment strategy of the state

The previous section on the recent history of Ethiopia shows that natural resource management is at the core of the country's development policy. Then the question is, how does the state translate its policy into implementable action? Understanding the hegemonic nature of the state's natural resource management program in Ethiopia requires a proper understanding of the nature of the Ethiopian state. The current status of the natural resource

management program is a result of the state's use of a combination of hegemony and governmentality projects to enlist citizens into its 'developmental state' ideology. On the other hand, understanding the nature of the Ethiopian state requires proper understating of the relationship between the governing party, the Ethiopia People Revolutionary Democratic Front (EPRDF), the state administrative bureaucracy, and the people.

The governing party, the EPRDF, has been in power since 1991, following the ousting of the socialist Derg regime. Since the party's ascendance to power, it has remained the single most influential government. The Ethiopian constitution allows the regional governments to establish sub-regional governments to ensure peoples' participation in their own administration and to provide essential services to citizens (FDRE 1995). Hence, in principle, the local governments are presumed to be autonomous, representing and defending the interest of their constituents. However, as Ayele (2011) argues, local governments continue to be part of the controlling apparatus of the state, rather than true representatives of interests of their constituents. This is due to an absence of clear constitutional provisions on the power and jurisdiction of regional governments and district governments, as well as the exclusive budgetary dependence of districts on regional governments (Ayele 2011). Thus, the centralized EPRDF decisions are the once that determine the national development agenda. Hence, understanding the role of the state in the Ethiopian context requires a proper understating of the nature of party politics within the dominant governing party, the EPRDF.

The current political ideology of the EPRDF on economic development is a result of its historical path as well as adjustments that it made along the way to respond to both internal and external demands. According to Vaughan (2011), the seeds of the EPRDF ideology were sown in the era from the late 1970's through the 1980s. These were the years where the armed struggle of the forerunner of the EPRDF, the Tigray People Liberation Front (TPLF) was developing into a complex state making organization. Three features of that era remained valid to this date. First, the TPLF used mass mobilization and associations as the core mechanisms of state making. Second, the village level political leadership and peoples' associations were active in ensuring peace and security, administering land, and promoting local development (ibid). Third, along with the strong focus on people's mobilization and organization, the TPLF maintained strong centralized party leadership to maintain the military assaults on their enemy (ibid).

A lot has changed since the initial years of state making under the TPLF. Now the party is bigger, forming a coalition with other parties of different ethnic groups to that became the EPRDF. Vaughan (2011) argued that despite the shift from their long-standing socialist orientation to that of a developmental capitalist orientation, the party maintains the importance of securing popular support through mass mobilization and organization at its core. Delivery and control of socio-economic advantages such as education, health, agricultural extension and micro-credits has been helping the party to keep its grip on popular support both in rural and urban areas.

Despite the continuity of the EPRDF's mass mobilizing and centralized decision making culture, two important episodes changed the way the EPRDF deals with economic development and its approach to mass mobilization. The first one was the internal party split in 2001 after the Ethiopian-Eritrean war. Following the internal party split, the winning faction led by the former Prime Minister of Ethiopia, Meles Zenawi, made major concessions in adopting liberal ideologies, emphasizing the central importance of the economy for the existence of the Front and the nation at large (Bach 2011). Many argue that this was the first time the Front had openly started showing its alliance with the 'developmental state' ideology, using 'modernization' through state intervention as the main political ideology to attack the other faction and legitimize subsequent policy directions (Gebresenbet 2015; Bach 2011; Vaughan 2011; Lefort 2010).

The second important episode was the 2005 election. Following the 2005 election, the Front was even more explicit with its 'developmental state' ideology. According to Gebresenbet (2015), the state started to portray its development plans as a matter of national security. In the 2005 election, the Front lost a huge chunk of its electorates to the opposition, forcing it to revise its political ideology. Three strategies define this period after 2005. First, the Front campaigned for an unprecedented increase in its party membership, from 760,000 in 2005 to 5 million in 2010 (Bach 2011). Second, democratic centralization took centre stage again, where by political decision-making shifted from the state organizations to the Front. Third, developmentalism¹² surfaced more prominently in the Front's ideology. Gebresenbet (2015) argued that EPRDF uses the securitization discourse to stress its resolution to fight poverty and ensure economic development. In the context East Asian 'developmental state'

¹² State developmentalism here refers to the state's assertion of its own role in economic growth and social transformation. In Ethiopian context state developmentalism is often presented as an antonym of neo-liberal economic ideology, where by the market is the main force driving the economy (Gebresenbet 2015:65, 67).

experiences, Gebresenbet (2015) argued, external threats were used as an instrument of legitimizing vigorous economic development by the state. In the absence of such external threats, the Front uses poverty as the ultimate enemy of Ethiopia that calls for an aggressive state economic intervention. It depicts apocalyptic consequences such as famine and national annihilation, for failure to embrace developmentalism. It uses militaristic terminology such as “war against poverty”, “developmental army”, “development patriotism”, and “developmental hero/heroine” to describe the sort of hegemonic consensus that the party wants to see develop among party members and the public at large (Gebresenbet 2015:70) .

These changes had significant effect on the way the state approaches development in general and natural resource management in particular. For example, according to Lefort (2012), the opposition used the state use of coercion on village development activities to convince local communities to turn away from the governing party, and it partially worked. In the subsequent years, the state smoothed its approaches and experimented with more soft mechanisms of influence. It eased on the more or less forced labour contributions for natural resource management campaigns and environmental restrictions such as enclosures (Lefort 2012).

In the context of smallholder farmers’, state developmentalism meant enlisting rural communities in selected priority areas set by the government. The two notable recent five year plans, the Plan for Accelerated and Sustainable Development to End Poverty (PASDEP) (MoARD 2006) and the Growth and Transformation Plan (GTP) (MoFED 2010) envisaged a large scale mobilization for national development. GTP especially was the most acclaimed and ambitious even by the ruling party standards. Hence, the ‘developmental state’ hegemony project of state requires citizens to fully embrace the state policy and work towards achieving the nationally set targets (de Waal 2013).

How does the hegemonic ‘developmental state’ ideology work? More specifically, how does the state mobilize large rural populations to adopt its ideology and participate in it? What are the effects of this process on watershed management interventions? One of the main strategies that the party uses to promote state developmentalism is to use its party members to promote it. As discussed above, following the 2005 election, the number of party members of the EPRDF grew from 760000 in 2005 to 5 million in 2010 (Bach 2011). In rural areas, the members have a specific role to play in their villages. They are the vanguards of the

developmentalist ideology of their party (Lefort 2012). Party loyalty, especially in rural areas, is demonstrated by taking up agricultural practices promoted by the state and then influencing their neighbours to do the same (Lefort 2012). As a result, they are also often identified as model farmers, although Lefort (2012) argued that this title has more to do with party loyalty than with farming competence. Hence, the penetration of the developmental ideology of the state depends on the legitimacy and competency of its party members at village levels.

When looking at the study villages, study village one had 550 party members and village two had 300 party members. These party members were also leaders of other social organizations in their village. However, in study village one, the party members that the researcher interacted with and observed in different party related meetings showed their strong allegiance to the party's ideology and worked towards promoting it. The party members attend meetings more or less regularly and show up to campaign projects, such as the watershed development work, on a regular basis. Members also were rated as working well in adopting improved technology promoted by the village extension agents. For example, in one party members meeting in the village, it was reported that of all the farmers who used government promoted technologies that production season, 29% of fertilizer users, 34% of those who planted in row in general, 71% of those who planted wheat in row and 89% of those who planted teff in row were party members (V1-Ob-9).

During the watershed development campaign, the party-members, who are also team leaders in grass roots development teams, are responsible for mobilizing other farmers for the work. Those at the leadership level oversee and participate in the watershed work actively. In all the days that the researcher was in the field during the watershed campaign in study village one, either the chairman of the village or his deputies were always present for the campaign work. It was also a regular practice for the higher level leaders within the party to form sub-committees and monitor quality of work and rank the performance of their subordinates on daily basis.

How does the leadership of the party members work? In principle, they are supposed to be vanguards, leading by example. This entails being among the first to adopt the developmental recommendations by the state. This is as a mechanism of encouraging other members of their community to do the same. Respondents who are party members said that especially after the

2005 election, party members are strictly advised not to use coercion as a means of mobilizing their community for development (V1-IIR-9, V2-IIR-6). In one observation of a village party meeting, the chair of the meeting who was from the district administration office pleaded with the attendants as follows;

“You are leaders and you should take responsibility not only for yourself but others as well. You are called lead farmers and you should be concerned about others as well, not just yourself” (V1-Ob-9).

Accordingly, the leadership in the study village one strives to minimize using direct coercion to mobilize farmers for development work in general and the watershed development campaign in particular. Many of the respondents that the researcher talked to said that before the 2005 election, the local leaders would use coercion as a means of mobilizing the community. Failure to participate in local development activities used to be penalized. After the 2005 election, however, penalties started to ease; in fact, initially it was completely abolished. However, when people refused to take part in development related activities, the leaders were advised to convenience villagers by allowing them to establish their own by-laws to control absenteeism. Penalties collected from violation of by-laws are now to be transferred to a local church, unlike the former practice of issuing legal receipts to transfer penalty funds to the district.

There were some problems identified during the analysis that undermine the role of the party members to lead by example and promote the developmental ideology of the state. First, there was a general feeling by non-party members that the party members, contrary to their titles, are not “vanguards” or “models”, and are not any different from the rest of the community. When asked whether the party members are any different from other farmers, one of the respondents stated “no, they are just like us, of course they bring lessons when they go to meetings. Otherwise, they are not any different from the rest of us” (V1-IIR-2). Second, a common complaint against the party members by the government representatives was that the party members agree to do their best and lead others, but fail to perform their duties when they go back to their community. The chairperson of study village one said, “The party members seem to agree on things when we are here in a meeting. But when they are out in their community, they don’t want to lead others” (V1-Ob-9).

Party members themselves identified two problems that they feel undermines their ability to lead others properly. The first is the issue of legitimacy. In one of development team leaders

meeting, a participant confronted the village leadership stating, “When we try to mobilize farmers, they usually say no and you are telling us that it is our failure. But on what authorities are we supposed to mobilize them, we cannot penalize them” (V1-Ob-1). During one of the focus group discussions with development team leaders, the leaders also lamented that the biggest challenge they face is their lack of power. The following quotation from party members FGD shows the dilemma between leading by example and using coercive power.

“We can’t force the people as they say that we are violating their constitutional rights. We are also told not to force people, but to convince. If we had the power to coerce, they would have come out. Now it is open for their will. Because of this we are not really putting the theory into practice” (V1-FGD-5)

“The previous regimes were forcing people into all the village development works such as watershed work, illiteracy campaign and all other development activities. This government especially after the 2005 election said that nobody should be forced into any development work. Now the people with no democratic culture do not know their responsibility. Despite knowing the benefits of village development works, they prefer to stay at home. They know the benefits, but they do not want the pain of getting what they want. You see, we are trying to lead a society which does not know what democracy is. We are told not to force anyone; we are told to lead by example rather. But these people have been under an autocratic leadership all their life. When we get softer and use only public announcements, nobody turns out for a meeting. But when we start punishing based on local by-laws, people turn out in full. However, we are living inside the people that we are punishing; they won’t see us with healthy eyes afterwards” (V1-ID-1).

The leaders were also complaining that they are fatigued with their responsibility. Some of them have been leaders of one sort or another for close to 20 years. Others have been in leadership positions for the last 5-10 years. This made a number of leaders complain and even submit a frequent request for resignation, but with no success. One elderly man who was a development team leader lamented;

“We are also tired as leaders. Some of us have been leaders for quite long time. We contributed our share enough and now we are getting old and we are tired. We requested for rotation of the leadership and engaging younger leaders, but our request

has been denied many times. They say you are good leaders and there are no people to replace you. They say the people respect you and follow your leadership and we cannot replace you. But this is not fair on us” (V1-FGD-5).

The situation with the female leaders was even worse. In one of the village council meetings, an expert from a gender office of the district took the women aside and started to discuss the weak leadership from the women’s side. The meeting turned into chaos when every woman started to shout demanding to be relieved from their responsibility. Some said that they were illiterate and could not lead; others said that they were sick and still others claimed that they were single mothers and were busy at home. Many of them said that they were assigned as leaders without their consent. It took a while for the expert to calm down the women and explain to them that they have to take their leadership seriously, and that it is the only way for them to fight for their rights (V1-Ob-9).

Because of the above challenge surrounding the use of party members to promote ‘developmental state’ ideology in rural communities, the effectiveness of party members in promoting watershed development campaigns was limited. Leaders often have trouble mobilizing their neighbours to turn out for the campaign, ensuring labour use efficiency during campaign time or ensuring work quality according to the guide that they are trained on. Compared to the second study village, however, the leadership in the first village was much better in many regards.

In study village two, the party members, especially those at the leadership position seemed to be at odds with the people. Unlike the case of the first study village, neither the village chairman nor the sub-village leaders appeared for the watershed development campaign work during the research field work. In village council meetings, at least in one occasion, the village chairman was absent and in another one he arrived two hours late. Out of the three sub-village leaders, only one was present at the three village meetings that the researcher attended. In one of the village meetings that the researcher attended, one farmer said;

“For me I see that we have no leaders, especially at the cabinet and development team levels. It is just a waste. People are not coming out for the work. We agreed that we should meet and discuss with the people on why they are not turning out for the campaign, but we never did so” (V2-Ob-1).

In another meeting called by development team leaders the chairman lamented saying

“We are lead farmers, let us ask ourselves, and are we really leading farmers? In the first few days, some 400 residents were present during the watershed development campaign. Now it is dead. Today the whole one-to-five and development leaders were called for a meeting to discuss the matter, but only a few are present, even those who came are sneaking out” (V2-Ob-11).

The village leadership was also implicated in serious allegations of corruption. During a village council meeting, the members of the council questioned cabinet members about unaccounted community financial contributions, to which the leaders failed to provide proper answers. Members of the council warned the cabinet, that such embezzlement of community fund would erode the trust of the people in the leadership (V2-Ob-1). The embezzled money came from fines collected for absenteeism on the watershed development work. One respondent lamented the following;

“There was a meeting with the village leaders on what to do about those who are absent from the work. The people demanded that they be given land to work on. However, the village leader refused saying that it will be a burden on the village to coordinate. Rather he insisted that they should be fined. Now the problem is, some people are absent the whole time and if they are fined, it will be too heavy on them. The reason we say that these people should not be penalized with money is that we don't know where the money goes. The leaders are insisting on penalizing with money because they usually embezzle the money. This is easy money which rarely gets audited. They want to fine people so they can embezzle the money. But us, we know this and we resist it” (V2-IIR-12).

The leadership in study village two also found itself cornered in a bigger political problem beyond its control. One area of political issues for the leadership had to do with the Afar pastoralists' intrusion into the village. After regional level negotiations between the Afar region and the Amhara region, the Afar pastoralists were allowed to graze their livestock inside the village territories during a serious drought in the Afar region. Under this condition, the village leadership was instructed by the district administration to be in favour of the Afar pastoralists and make sure that the villagers were restrained from igniting conflict with them. Many respondents that the researcher talked to lamented that the village leadership decided to

side with the Afar pastoralists rather than defending their village's interests. They said, the moment the leadership decided to side with the pastoralists, the people also decided not to cooperate with the leadership on anything, including the watershed development campaign (V2-Ob-8).

There was also tension between the leadership and members of the community over the sensitive issue of religion. The village is one of the hotspots identified by the district for religious extremism and illegal money circulation. Many in the village have relatives in Arab countries and the government officials at the district suspect that these connections expose the villagers to religious extremism. The village leaders were involved in cracking down these extremists in response to the demands of the district administration. Many of the villagers resented their leaders for these measures as the villagers felt the leaders were siding with the government at the expense of their own people (V2-Ob-8).

Because of these complicated issues, the second study village can be characterized by a weak ability of party members and those in leadership positions to use their party's development ideology to mobilize people for development work in general and the watershed development campaign in particular. Out of desperation, the village leadership resorted to coercion to get things done. In one meeting that the researcher attended, the village chairman claimed that he had punished a neighbourhood that had refused to turn out for the watershed development campaign by cutting off their public water supply system (V1-Ob-1). Instead of scaring them into compliance, these coercive measures seemed to do little more than inspire anger among the villagers. They showed their resistance by paying whatever penalty was imposed on them. One respondent lamented;

“I have seen three governments. As I see it, we have changed a lot. Things are more democratic now. We used to be under leadership from someone whom we did not know; we used to give our produce. The EPRDF expanded democracy. Now we don't complain about the EPRDF but the local authorities are now suppressing the people. Both in the village and in the district the people in power are just abusing their positions. People are now very irritated” (V2-Ob-4).

The political vacuum among the party members as well as between the party members and the villagers was observable in village development activities. Unlike the first study village, participation in the watershed campaign was too low. Although the village development

agents¹³ reported that there was an average turnout of close to 50% during the campaign period of 2013/14, the chairman of the village declared that the maximum turnout was never more than 400 people, out of 1400 expected. During the entire field observation, the turnout at the campaign site was always less than 100 people. There was even an incident when the work was halted all together because of low turnout. The amount of work done during the 2013/14 campaign was also too small and was done poorly.

In summary, the government enlists large numbers of its citizens into its ‘developmental state’ ideology by creating a hegemonic ideology around its policies and programs. The state ideology claims that poverty is an existential threat to the nation’s integrity and that the state has the right competency, willingness, and commitment to promote national development more than any actors, either domestic or foreign. Party members at different levels are used to enlist others in their area to the government ideology. That was also happening in the watershed development campaign as well. Resisting any of the prescriptions by the government was considered anti-development. This helped both in mobilizing large numbers of people in rural communities and in ensuring a huge amount of coverage for soil and water conservation and land rehabilitation programs on the local and national level. However, it also nurtured an uncritical attitude toward government programs. Even when things were not working or performing poorly, local communities and lower level governments were conditioned not to speak out. As a result, local communities resort to subtle ways of resistance and local experts resort to false reporting to fulfil targets imposed from the top.

5.4.2 Governmentality as containment strategy of the state

The hegemonic ‘developmental state’ ideology requires complex governmentality arrangements to reach and influence those who are at the very bottom of the socio-economic spectrum. The governing party uses both state and party lines to promote and implement its ideology. Some of the governmentality strategies employed by the party that are relevant for the watershed development intervention include: top-down target setting, social organization at different levels, public conferences, regular monitoring and evaluation, reporting and feedback mechanisms, work norms and standards, collection of statistical facts and figures,

¹³ Development agents are government experts at village level with expertise of agronomy, natural resource management or livestock production. Each village has three development agents. They are responsible for the overall agricultural development of their village.

and the creation of a spirit of competition at different levels. This section explains these mechanisms in brief detail.

Top-down target setting

One of the main instruments of the EPRDF to promote its developmental ideology is top-down target setting. To this effect, it fuses constitutional based forms of organization with the party organization. Apart from the centralized party decision making culture discussed above, the budget dependency of lower level administrative units to higher level units such as the regional and national governments made top-down planning a norm rather than an exception.

Ethiopia is a decentralized country. The Federal and Regional governments share power, with regions vested with the responsibility of establishing sub-regional governments. All the regions have at least two sub-regional government levels, districts and villages. At all levels, federal, regional, district and village, there are citizens' councils. Each Village sends its representatives to the District to form the District council. Each District also sends its representatives to the Regions to form the regional council. Some regions have a zonal council as well, but in other regions, zones have the limited power of overseeing districts only (Yilmaz and Venugopal 2008). Although these structures and councils are meant to control the power of the executive and increase citizens' participation in decision making, in practice they are also used by the EPRDF to promote its political agenda (Ayele 2011; Yilmaz and Venugopal 2008). This is an age old problem in Ethiopia, whereby social organizations which are meant to give the people voice turn out to be instruments of state control (Mammo 1999; Dessalegn 1984).

There are two explanations as to why centralized decision making prevails despite the decentralized structures. First, as Ayele (2011) noted, there is a budgetary dependency of local governments on higher level governments. Most regions still receive subsidies from the federal government. Many districts survive only through budget subsidies, about 80% from their regions. Under these conditions, it is possible for the Federal government to influence development pathways nationwide. On the other hand, Yilmaz and Venugopal (2008) and others such as Ayele (2011), Vaughan (2011), Bach (2011) state that almost all the leadership and council member positions in the local governments are occupied by members of the ruling party. In the Amhara region for example, the head of the regional bureau of agriculture

is the deputy president of the region and the heads of the district agricultural office are the deputy administrators of their district. Among the five million members of the ruling party as well, many are civil servants working for public organizations. This high degree of control on formal state organizations enables the governing party to propagate its developmental ideology.

The party's control of public organizations nurtures top-down development planning. On the watershed development intervention, for example, the recently completed Growth and Transformation Plan was developed at the federal level by the EPRDF and each region was expected to develop its own plan in order to meet the nationally set targets. On their part, the regions gave targets to each district in order to meet regional targets. This top down approach makes meeting those targets an arbitrary and difficult task for lower level officials. Targets set at a higher level are usually difficult to achieve at the lower level, yet it is the lower level officials that are held responsible if they fail to achieve the targets set for them. In one of the district performance evaluation meetings that the researcher attended, the Development Agents (DA) were blamed by the district for failing to contextualize the targets set from above to fit their village's circumstances. In response the DAs argued that it was not the problem of the development agents, rather it was the problem of the district as it was them who had imposed the targets on the village. One participant argued "how can we contextualize when we are evaluated based on how much we accomplished of what we are given by the district?" (GDAO-Ob) An interview with a zonal expert also revealed some of the problems with setting targets from above, although he concurred with the planning approach. When asked about the extent that those at the lower levels could contextualize decisions made at the higher levels, he said;

"Well, regions prepare their plan by taking the federal plans into consideration. When the region brings the plan to the zone, they set the targets. The targets are not negotiable. We all are required to fight to reach it. You cannot complain about targeting, you have to fight to reach it. The targets are made to stretch us. Some targets seem too hard. We are fighting poverty, when you have a fight with poverty, you do not fight it with bottom up planning. You rather need to fight it with top-down targets. When we get targets from the region, we distribute them to the districts. The districts also complain. However, as leadership, we make sure that we create mutual understanding. We call on all the leaders from the district here to make the plan a mutual responsibility. They in turn, go and make the plan a mutual responsibility with

the experts and the people. Whether we are able to achieve the plan or not is different issue. What we focus on, is taking the target as a mutual responsibility and fighting hard to achieve it. We have a lot on our hands. We are working to correct all our past irresponsibility and working hard now to compensate for the time lost in the past as well as for our current responsibility. But, not all are on board with this. Some say, plans are like a hot potato, the region throws it to the zones, the zones to the districts and the district down to villages” (NWAOK-II).

Local organizations

At the village level, the party uses a mix of state and party forms of social organizations to promote its ‘developmental state’ ideology. The formal social organization of the village includes the village cabinet, the village council, development teams and one-to-five teams. The village executive committee, also called the village cabinet is the highest leadership and administration body consisting of the village chairman, the vice chairman, the village judiciary tribunal, the village militia, the village manager as well as village level expert representatives from agriculture, health, education, and land administration. The study villages have three sub-villages with one leader coordinating day to day activities in the village. The cabinet represents the core political wing of the village with the highest decision making power, although in principle they were supposed to be answerable to the village council.

The village council consists of a group of farmers who are elected by their neighbours to represent them in the council. Since it is a political representative body, membership is based on political affiliation. Hence, all the current members in the two study villages were members of the ruling party. The council meets once a month to hear reports from the sector offices in the village and pass decisions. It is an important forum to monitor and evaluate development initiatives in the village and pass by-laws. The village judiciary uses the by-laws enacted by the council to settle cases. With the expansion of the number of party members after the 2005 election, the number of members as well as the prominence of the village councils have increased nationwide (Vaughan 2011; Yilmaz and Venugopal 2008). In the context of the study villages, study village one had 400 council members and study village two had 300 council members.

The village residents are further grouped into development teams. These are complex team formations with varying numbers of membership depending on the purpose of the group. In general, the heads of each family in the village make up the core of the development teams with one team comprising of 20-30 family heads. Then, depending on the purpose of the team, it can expand or contract. For example, for agricultural extension advice, only the head of the family is considered a member of team. For the watershed development intervention, anybody between the ages of 15-65 is considered to be a team member. For political mobilization, everyone with the capacity to participate in political activities is considered a team member. Accordingly, there were 66 such teams in study village one and 44 in study village two. Each team has one team leader, who is a party member farmer.

Each development team also contains 4-6 four to six teams that are called one-to-five teams under it. One- to-five teams are the lowest level of social organization. They are called one-to-five teams because they comprise of five one leader and five team members. In the study villages, study village one had 330 and study village two had 210 one-to-five teams. Most, but not all the leaders of the one-to-five teams are also party members and take orders from the development team leaders. The members of one-to-five teams are assumed to meet on a regular basis as they are neighbours who share social lives together. The role and accountability of one-to-five teams and development teams as well as the village leadership was summarized by one of the respondents as follows;

“One-to-five teams are supposed to bring their team members to work. The development team leaders are supposed to link the government with the people. They follow up with developmental activities; they are the government of the 30 people under them. They are both responsible and accountable. The sub-village leaders are supposed to lead the development teams, give work for the teams, and evaluate the performance of the teams. We implement the village plan which we receive from the village experts” (V1-IIR-6).

In the watershed development intervention these social organizations were highly praised as a success story by the government at different scales. The region claims that it built a well-functioning development army for natural resource management, whose experience could expand to other areas of development in the region. In one of the feedbacks to the zone, it states;

“The natural resource management work is one of the areas where we have developed a better experience compared to other areas of our work and ensured the deployment of a well-functioning development army” (ARADB-6).

The chairman of the Gubalafto District Agricultural Office also argued that the region as well as the district have successfully built a development army for NRM and that it should be scaled up to cover other areas of work such as crop and livestock production (GDAO-Ob). However, this claim is debatable and the debate reveals the complex ways in which the government uses hegemonic and governmentality projects in combination with coercion to get their plans implemented. During an annual conference for development agents, the development agents disagreed with the claim that developmental army was built on NRM. One of them said;

“If we say that the development army built on NRM is not active in other areas such as crop production, then there must be a problem in our claim of the army building in NRM. The army members in all cases are the experts, development agents, the leadership, and farmers. If these actors fail to extend their work experience in NRM to other works as well, then these actors are not changed yet. Did we really manage to build a natural resource management army? If so is this army free from impositions and external influences? Why do we fail to extend the success of army building in natural resource to other areas?” (GDAO-Ob)

In response, the chair argued that the government claim that the development army built on NRM is well grounded and the fact that this same army failed to reinvigorate crop and livestock production with the same sprit should not overshadow its achievements in the NRM sector. He argued;

“The term army is taken from the military. Different armies could deploy on different war fronts. The enemy could come from different directions. The army could be defeated on one front, and win on another front. Out of all the fronts, we are winning in NRM. We managed to mobilize 90% of the working force using development teams and one-to-five teams. Those who were out for the watershed campaign work though mobilization did their work through their organization. A command post was evaluating the activity every day. This does not mean that there were no problems at all. Some villages might have forced farmers. However, the overall evaluation is that there was good performance. It is wrong to assume that once we build development armies, it will do everything. We need to work on transferring the successes made in NRM to other activities. Farmers do not have a problem with things that require only

their labour. The crop production needs more than labour, it is business and we are not yet ready to influence farmers' attitude to work in their organizations [...]. If we think that an army built will not have a setback, we are making a mistake. If we do not have good follow up, they may return. It does not also mean that an army built is without any faults. The major issue in army building is to have a similarity in attitude and competence and do your job through the established organizational structures” (GDAO-Ob).

Comparing the two study villages on the functioning of social organizations, study village one had better social organization compared to study village two. On all levels of leadership, those in study village one held regular meetings with much better attendance compared to their counter-parts in study village two. In study village one, each time the council meetings that the researcher attended was convened; it had a minimum of two third attendances of its members. In study village two, on the other hand, there was an instance where a council meeting had to be rescheduled three times because of low attendance. The third time it was held, it was held with only 50 of the 300 members in attendance. The same goes for the development teams and one-to-five teams. While in study village one, villagers know their developmental and one-to-five team leaders and members very well, in study village two they only know their development team members and one-to-five teams are still a new institution. During the watershed development campaign work, the leadership in study village one was strict on distributing the work to the one-to-five teams. The sub-village leaders would move around the development teams and check if the work was distributed to the one-to-five teams. In study village two on the other hand, the work was organized only in development teams. In study village one, the village cabinet held regular meetings, sometimes every day, during the watershed development campaign work. In study village two, there were hardly any command post meetings. All these differences partly explain the performance difference between the two villages.

Public consultations

Public conferences are part of the long tradition of EPRDF public engagement forums, mainly adopted from its armed struggle culture (Vaughan 2011). Reaching ‘consensuses’ with the people on issues that the party deems important have always been a defining characteristic of the decision-making process of the party, with farmers conferences used as the main forum

for engagement (ibid). On the historical nature of these conferences, Alex De Waal noted “The TPLF struggle was a model of a Gramscian hegemonic project through a combination of thorough (sometimes interminable) debate, persuasion, policies in line with peasant demands, and rigorous enforcement of the party line once it had been adopted ” (de Waal 2013:3).

Accordingly, at the beginning of each year the state organizes two types of public conferences for villagers, one for the party member farmers and another for the general public, held for five to seven days. The village cabinet organizes the party members’ conferences, with the facilitation of the conferences led by a political representative from the district. The conferences aim serve as an evaluation of past years’ development performance and introduction to the plans of the upcoming production year. Ideally, it is meant to create a forum for dialogue with the people by allowing for debate among party members and with the party leaders from the villages and the district. During one such conference, the district party representative who chaired the conference said that the aim of the conference was to motivate members of the party to work hard and lead others to follow their path. He stressed that such a commitment requires full conviction to the party development agenda. Despite such sentiments, however, even for the party members, these conferences have their limits. Their freedom to debate was allowed only under a general framework decided at the district.

In connection with the watershed development work, the conferences were also the forums for knowledge sharing and deliberation on: the importance of the campaign work, technical issues related to the structures to be built, control mechanisms for absenteeism, and maintenance of structures. Key decisions about such topics as, the sites for watershed development work, the number of days and hours of work, work norms and control mechanisms are made in these conferences. These conferences are followed by conferences for the general public. These conferences are organized at the sub-village level, with facilitation from the village level experts. The party members are also expected to attend these meetings in their respective sub-villages to make sure decisions made are in accordance with the decisions made during the party members conference.

In the conferences, that the researcher attended, both for party members and the public, effectiveness of the conferences in influencing people to build a consensus was curtailed by a number of logistic and facilitation problems, apart from people’s reservations due to the political nature of the meetings. In terms of logistics, the conferences in study village one

were conducted in a small open space, with no seats and no sound system. The number of participants reached 400, thus it was impossible for everyone to follow the proceedings properly. Additionally, the conference agenda was too broad, covering every village development activity from NRM, to crop production, livestock production, irrigation, compost production, primary school enrolment, vaccination issues, and security issues. As a result, the chair, did not keep the topics open for discussion for long, but rather closed them quickly to jump to the next agenda.

Despite these shortcomings, the conferences also opened an opportunity to debate on issues within local control. Problems related to the leadership, and the development work were discussed and debated. The conferences were also concluded by distributing planning forms, whereby each participant was asked to plan their yearly agricultural activities. Although they are not taken seriously, such exercises open discussions and debates.

In terms of participation, the conferences in study village one were relatively better. For the party-affiliated farmers, the attendance was 70% of the expected participants and for the general public it was around 90%. The debates for the party members were also more open compared to the general public conference. As shown in the previous paragraphs, the public was cautious of openly resisting the conference agenda already decided by the party and the vanguard farmers. Although the researcher did not attend any conferences in the second study village, an interview with the local development agent revealed that the conference had to be adjourned repeatedly due to a lack of participants. Finally, the conferences were held under serious political pressure from the district with a threat of heavy fine for non-attendance. Informal discussion with some of the villagers also revealed that the discussions were more informing than consulting. Many of the decisions taken were those made by the district.

Regular evaluation, reporting and feedback mechanisms

Regular evaluation meetings, reporting and feedback was also an important part of the governmentality project of the state in order to ensure that the developmental targets set from the above are met. During the watershed campaign, the development teams held brief meetings among themselves after every campaign day. Later they join bigger groups in their sub-village for an overall daily evaluation and discussion on work quality, attendance and control. Either sub-village leaders or village level experts usually facilitate these meetings.

The village cabinet then meets every day after the campaign work to evaluate the daily performance and prepare a report for the district. The evaluative nature of these meetings is also a result of the political culture of the ruling party, whereby it uses self-criticism as a way of promoting learning, mutual monitoring, and evaluation (Vaughan 2011; Chinigò 2014; Bach 2011). Reports of these meetings, mainly statistics such as the number of people who participated in the work and the amount of work accomplished during the day are sent to the district on a daily basis. The district government also transfers these statistics to the zones and the zones transfer them to the regions on daily basis. Based on these reports, the regions send feedbacks every month for each zone and each zone to the each district and each district to each village.

Work norms and standards

The watershed development program is a national program, although each region has the right to adapt it to its specific context. One way of ensuring uniformity of implementation of the national program was standardizing the work norms. The standardization applies to the number of days for the national campaign, the number of hours spent per day, the demographics of the people who are expected to take part in the campaign, the amount of work to be done per day per person, and the social organization of the work. Accordingly, in Amhara region, 60 days of campaigning was set to be the standard, with eight hours of work per day, all rural residents of age 15-65, working 4-6 meters of physical structure in their one-to-five teams and development teams.

Collection of statistical data

Collection of statistical facts and figures across all villages, aggregating it at the district, zonal and regional levels give national representatives a quick way of identifying the work done and feedback to be dispatched. For example, all villages are required to identify the number of able bodied labourers that can engage in the watershed work as well as the type and number of farm implements that each labourer would be able to contribute to the campaign work. This is done 5-6 months ahead of the campaign work. One-to-five teams, collect the data and report it to their development teams. During the campaign period as well, the number of labourers that worked each day as well as the amount of work done per day was collected and reported daily.

Creating a sense of competition

Competitions had also been a large part of the watershed development campaign. It starts from the lowest level of social organization, one-to-five teams. Elected representatives from each sub-village monitor the work done over a certain day and provide feedback on the quality and organization of the work in one-to-five teams. Throughout the course of their monitoring, they give out green, yellow and red marks indicating good, medium and bad work respectively. Thus, while celebrating good performers, they also shame those who performed poorly. At the district level, the administration holds competitions once a week and sometimes even daily. Daily reports are the main source of information for the weekly competitions, although feedbacks from district experts monitoring reports are also used. Each district also facilitates competitions at the zonal and regional levels. All zone, district and village winners receive a green cup award at a ceremony organized by the regional government.

The results of the district competitions are used to rank the villages performance. The leaders, mainly the village cabinet take the ranking very seriously and use it to mobilize other leaders as well as villagers. In study village one, for example, the village has been ranked in the top three out of the 34 villages for three years. During the field work time, the rank of the village dropped between five and seven, which was a big concern for the leadership. They urge all the development team leaders to take their role seriously and reinstate their higher rank. In study village two on the other hand, the ranking usually was a source of shame as they had been consistently ranked low. The following was a quotation from the village chairman;

“When we are compared to others in our district, our rank is last, 34th. They can’t make us 35th, because there are only 34 villages. We are last; we are last in everything. We are last in tax payment, credit repayment, contributions and everything” (V2-Ob-1).

In summary, the government uses complex sets of governmentality projects to translate its ‘developmental state’ ideologies into reality. The governmentality projects are the main means of transmitting messages and information from the top to the bottom. Decisions made at the federal level can reach villages in a matter of weeks through the social organizations created at different scales. Information travels also from villages to the federal government with relative ease. However, information travelling up in the scale is highly filtered to fit to

what the decision makers want to hear. The governmentality projects are also the main mechanisms of control at different levels. For the watershed development campaign, the different forms of state governmentality enable the government to handle a huge endeavour with a relative ease. In terms of the implications of the governmentality mechanisms, while the mechanisms made the state strong and enabled it to mobilize and control large numbers of people in the watershed work, it weakened the position of those who were governed. It denied local people any alternative form of social organization which is not controlled by the government. This creates subtle resistance. Despite knowing the benefits of the watershed development work, people often resent the fact that their everyday life is under constant control. The differences in the functionality of the governmentality mechanisms between the two study villages also explain the difference in performance of the watershed development work in the two villages.

5.4.3 Resistance as a counter containment strategy of people

The containment strategies of the state, both the hegemonic and governmentality projects, to mobilize local communities for collective watershed development achieved mixed results. The opinion of the government is that the strategies worked well in mobilizing millions of farmers' nationwide for resource management. This exercise of the state in using its political power to direct citizens to its own developmental projects faces resistance as the national targets travel down from the federal government to local communities. Such resistance of local communities toward the collective watershed development work not only reduces the coverage of the campaign work, but also influences the quality of work and its sustainability. Some of the forms of resistance are common to the interventionism logic of the state in general. Other forms are specific to the watershed development intervention. Some of the resistance targets the state institutions, others target the micro-politics created by the state interventionism. Others are simply a result of a desire to free ride inspired by laziness by those who want to resist any form of restraints either from the state or from the community at large. This section presents the two major forms of resistance, absenteeism and vandalism in the watershed development work. However, before dealing with the forms of resistance, we will look at the social and ecological challenge of fostering collaborative resource management among local communities in the two study areas.

One of the major challenges of the watershed development work has been breaking down the individualistic tendencies of the villagers in the study areas that have been long entrenched for cultural reasons. Household autonomy and individualism are cultural traits that define the people of northern Ethiopia (Adem 2004). Kinship or any other horizontal solidarity is usually weak in these societies. As a result, families are expected to stand on their own feet, defend their interest and maximize their personal gains (ibid). There are many examples from the study villages that demonstrate individualism overriding cooperation even when cooperation appears to be the reasonable approach for collective gain. One example is found in flood diversion from farm plots. During the field work time, there were instances where farm families of five to seven failed to reach a consensus on how to divert the flood out of their farm as they were concerned with defending their own plot. Although the village administration was involved, the case was too complicated to be resolved by political intervention. The affected farmers defended their individualistic stance by arguing that they have land certificate and are paying taxes on it thus, nobody else has the right to do anything to their land without their agreement. In the end, several unlucky farms were exposed to the cascading flood and lost their standing crop.

Freeriding was also another form of chronic individualism. In the watershed work, many agree on the benefit of the work especially on communal and public land. Because the first study village is prone to flood damage, many in the village do not question the importance of the soil and water conservation work. However, as one of the respondent put it “despite the knowledge of the importance of the work, everybody wants to avoid committing themselves to the work” (V1-IIR-4). That also explains the usual complaint of the village leaders and experts alike. During village conferences, the importance of the work is not usually challenged. Farmers agree with the work, however when it comes to implementation, to the dismay of the leadership and experts, even those who were strongly supporting the work tend to not arrive for work during the campaign work (V2-Ob-1).

Even the age-old customary labour sharing and conflict resolution mechanisms are slowly withering. For example, villagers used to share labour during peak agricultural production seasons. Neighbours as well as relatives used to help out each, with reciprocal arrangements. Now that culture is almost gone, except among very close family members. One of the respondents said;

“Look, I have been sick for the last two weeks, yet it is a peak weeding time. In the past, my brothers or my neighbours would come and ask me how they could help, or go and do my weeding after they finish theirs. Now, no one is here to help me. The work waits until I get well and do it” (V1-IIR-11).

Another respondent said “Helping one another has been gone since our fathers’ days. We used to share and help each other in all our life. Now, you are by your own” (V1-IIR-2). The frequently cited reason for disappearance of reciprocity was monetization of labour. Because of small land size and sometimes landlessness, the villagers started going to towns or even temporarily migrating to plantation areas very far from their village in order to earn money for their labour. This led to the practice of recruiting labourers in peak agricultural seasons. Especially with the introduction of irrigated cash crops such as sugarcane, potato and onion, farmers must have the financial capacity to pay for labourers. As a result, the whole issue of labour sharing has increasingly become an old concept.

The other challenge was land fragmentation. Some respondents said that their farms are too small to require cooperation with others. Fragmentation of land also tends to encourage farmers to have a very narrow focus on their farmland only. In one of the focus group discussions, one of the discussant expressed this problem as follows;

“Our land is too small; hence we think in terms of our land only. I don’t think that if my neighbour’s land is saved, I will also benefit. We have been doing development for long time. We have seen the benefits on the hillsides. We were trained repeatedly. However, we tend not to practice our training. Even when I try to implement the knowledge I have, my neighbour won’t accept and cooperate with me” (V1-FGD-3).

Others said that farmers are also suffering from soil erosion and flooding and hence it makes more sense to work on their own land rather than going to help others.

The final challenge is related to the perception of usefulness of the watershed development intervention. Some of the respondents said that they could not see the immediate benefits of some of the collective works such as the soil and water conservation work. In such situations, people fail to see the incentives of cooperating with others as it costs them labour, time and resources. This was more the case in study village two. In this village, problems of flood and soil erosion are not very severe due to its flat topography. The village is also close to the semi-arid lowlands characterized by serious moisture stress. Land size is also larger in this village, thus farmers focus on the overall gain on their farm than investing all their labour on a

single plot, as was the case in the first village. On top of this, many families in this village have a secondary income source of remittances from their relatives working in Arab countries. All these factors make people question the importance of the watershed development work. The following are two quotations from an individual interview and a focus group discussion reveal these issues;

“When the government comes and talks about development and then agriculture, people give it a deaf ear arguing that they have been working on the soil for ages and nothing has changed. They argue that there is nothing new to come from the current intervention except tiring them. They believe that only industrialization could change their life” (V2-IIR-9).

“The thing is we really don’t think that we could transform our life with any work which is related to the soil and the land. If the government wants to change us, it better to either bring us factories or get us irrigation water. Otherwise, the soil and water work it is advocating has no use. It will never save us from drought. It could be better than having nothing, but it will not take us out of poverty. If drought comes, it will definitely strike us hard. People would definitely work hard if they see the benefits clearly. Now what we get from the watershed work is tiredness” (V2-FGD-1).

Hence, individualism, the tendency to freeride, disappearing customary arrangements for collaborative work, land fragmentation, and the failure of some villagers to see the immediate benefits of the watershed work make it a difficult task to coordinate the collaboration of all community members on the watershed development campaigns. The government approach, as seen in the previous sections, was not tuned to deal with these complex social issues. For the government officials, a village is the intervention unit. They homogenize the problems, aspirations and commitments of villagers while people even in a same village have different riskscapes, aspirations and capabilities. In these circumstances, the use of soft power and pseudo democratic hegemonic and governmentality projects promoted by the government does not escape resistance, either in subtle or open ways.

People have different ways of resisting developmentalist projects of the state. When the focus is narrowed down to the watershed development campaigns, three forms of resistance by local

communities can be identified. These are absenteeism/labour wastage, poor quality of work, and vandalism.

Absenteeism during the watershed development campaign work was one of the ways villagers demonstrated their resistance. The regional guideline on mobilization sets high expectation which made it quite difficult to implement. It requires that 80- 100% of the total working age population, age 15-65, participates in the watershed campaign work. This raised serious questions about who is eligible or not for the watershed work at village level. There were some people who were landless and who have to work as daily labours to support themselves. Others were lactating women and some were simply sick. However, to fulfil the norms set by the district, the local leaders had to force people to appear for the campaign work. The following quotation from one of the elderly respondents clearly indicates the problem with the expected number of people for the work;

“Many people are sick these days. We are all getting weak and sick. There are also old people. These people could not go out to the work. When these people are absent, we should avoid being jealous of them and excuse them. There are also people who live off daily labour work. When they are absent, we tend to be jealous of them and force them to come. How can they feed their family if they do not work? They usually ask to do the work one day and do their personal business on the other day. However, we, the full time farmers, tend not to sympathize with them. Our development team leaders should work hard to ensure that only those who are capable of working on the watershed are out for the work” (V1-IIR-7).

In study village one, controlling absenteeism was difficult for the people and the leaders alike. Absenteeism was punishable by the village by-law, which was 20 birr per a working day. People often debate the penalties imposed on absenteeism, some arguing that it was the only way to tackle absenteeism and others saying that it is too strict. Ideally, the village community could discuss who could work and who could not. In one local meeting, the sub-village leader complained to his villagers that everyone was saying they were sick and could not work, while going out to their farm to work. He argued that if there were people who were genuinely sick and could not work, it should be discussed in the village meeting and those people should be identified and excused from the work. This was a genuine concern as the researcher also saw many women with children on their back as well as many physically weak people, because of sickness on the campaign work site. However, the villagers resisted

this idea, arguing that people are naturally antagonistic towards each other and it is impossible to have genuine deliberation on who is able to work and who is not. The leader made this proposition repeatedly at many other occasions as well, pleading with the villagers to sit and discuss who is able to work and who is not to no avail. As a result, the leaders ended up fighting with villagers over absenteeism, even with those who had a genuine reason not to turn out for the work. Overall, however, for study village one, the number of attendees was always higher than the number of absentees. Penalties also worked well as the fines collected from absenteeism was deposited in the local church to be used to fund social projects in the community.

In the second study village, the turn out during the watershed work had been too low. The official figure communicated to the district was that 1400 members of the village would be participating in the campaign work. The maximum turnout was only ever 400, however. During the fieldwork time, attendance during the campaign work has never been more than 100 people. There were even days where the campaign work was halted for a week because of due to a lack of participation. In fact, there were entire sub-villages that refused to come to the work. In a discussion with one of such village members, one respondent complained that the campaign work was done in a sub-village that was one hour by walking from their sub-village and it has no ecological relationship with their sub-village. He claimed that they defended their case during the village conference and that they were promised that they would be allowed to work in their sub-village. However, when the work started, they were told to join the other sub-village (V2-Ob-5).

The penalty system for absentees was also loose in study village two. During the village council meetings, members complained that the issue of penalty had been under discussion in almost all meetings, but it never was materialized. The leaders kept blaming each other for not implementing it seriously. The effectiveness of the penalties was also debated. On the one hand there were some farmers who argued that they have seen the community responding to penalties when the leaders were serious. Others argued that even fines up to 300 birr, which is a lot of money for farmers, would not force people to come to achieve adequate attendance levels (V2-Ob-11). The following quotation from one of the frustrated village leader seems to summarize the problem;

“People are in rebellion. We penalize the absentees, but when they are too many, it is difficult to penalize them all. Like in my group, around 15 people out of 30 are

absent. I was supposed to penalize them 30 birr per day, but it is too much. Those who came, they were there not because they believe in the development work, but because they were afraid of the penalty. They don't realize that this work, if well done, could benefit the village" (V2-Ob-11).

Even when people were out for the campaign work, they still showed their resistance in a number of other ways. One of the ways was by delivering fewer results compared to the norms set by experts. According to data obtained from Gulafto district, the labour efficiency of study village one was around 70% and village two was around 48%. The picture at the overall district level seemed to be much better at, 94%. These figures were calculated by comparing the number of man-hours required for the structures to be built and the actual amount of labour that was performed based on self-reporting of the villages. These figures are inflated deliberately however. A single cross-checking of a report sent by the district to the zone with a feedback report sent by the district to villages shows that while the report to the zones show 94% labour efficiency, the feedback to the villages shows 70% efficiency. The observation of the researcher in the field was that the labour efficiency is much lower than the official figures.

The second form of resistance was the delivering of poor quality work. There was a general consensus among experts and local communities alike that there was enough knowledge and skills on soil and water conservation measures for the work involved. For at least the last five years, all one-to-five and development team leaders were trained for three days every year on soil and water conservation measures. The development agents were also trained every year for at least a week. Apart from the training, farmers as well as development agents had sufficient practical experience from their daily lives as farmers. In spite of this, quality was one of the biggest concerns of both experts and local communities. In many cases, the physical structures especially on private farm plots were not well designed and were poorly constructed. Many of the respondents attribute this to "ignorance" which is essentially code for carelessness as a way of showing resistance (ARAD-2; NWZAO-1; GDAO-1; V1-KII-1).

The third form of resistance was vandalism, destroying the physical structures constructed and the fodder trees planted. Both of the study villages had been under different interventions for soil and water conservation since the 1974 and 1984 droughts. Hillsides were enclosed, treated with physical conservation structures and afforested. Farms close to hillsides were

also treated with conservation measures. The work was done through food for work and community mobilization programs. Dessalegn (2003) wrote;

“Owing to inadequate planning and management, and also the food aid factor, far too many buds and terraces were built. Not infrequently, buds were built on farmland without the consent, participation or even knowledge of owners of the land. Moreover, many of the structures were poorly built and soon became an erosion hazard. Maintenance work received little attention, confirming the view that for the MoA agents in the field, conservation was a once-only exercise [...] on many occasions, peasants destroyed the buds and terraces that they had been paid to build in order to be paid again to rebuild them.”

Vandalism, in the forest areas was even more serious during the civil war period, when the army, especially in the second study village, destroyed natural forests and trees in enclosures. The vandalism intensified even further after the downfall of the socialist Derg regime, in the power vacuum during the transition period. The community removed enclosures, cut the trees and let livestock graze indiscriminately. Farmers who were forced to build them destroyed the conservation structures deliberately. The land re-distribution made things worse, destroying the sense of ownership of the land from the community and promoting vandalism on established physical structures (Admassie 2000; Dessalegn 2003).

Vandalism as a way of resistance continued in the current watershed development work as well. There were no serious problems in the communal and public lands in both villages however. In both villages, free grazing and vandalism were under control in enclosure areas. Hence, despite the absence of essential maintenance work, there appeared to have been no active destruction of the structures. On private farmers, however, villagers tended to actively destroy the structures. One of the respondents from study village one said;

“We say that the work is beneficial, but that is just rhetoric, in practice we do not seem to believe in that. We plough the structures, we graze the fodder, we induce flood deliberately. We still lack the proper attitude. I hate the development work this year because if we are going to destroy what we have developed, what is the use? We still need to change our attitude.”

The structures on farmlands take a lot of space compared to the small size of the villagers' land holding. Dessalegn (2003) estimated that there was 10-15% loss of farm size due to similar conservation measures which were implemented during the Derg regime. Farmers

complain about the land lose despite acknowledging the usefulness of the structures. Hence, rather than maintaining the water harvesting structures and the bunds, they plough them, little by little, until the structures are destroyed. Such action might not be surprising given farmers have no say over what sort of structure should be made on their farm. One respondent from study village two complained “Our land is now very fragmented, when we make the structures, two three of it on one farm, farmers feel like it is taking too much space and they destroy it” (V2-IIR-12).

However, it was not just the size taken up by the structures which was problematic. Some of the respondents also argued that the fact that the owners of the land were not allowed to work with the team who worked on their farm also contributed to a lack of a sense of ownership of the structures. One respondent from study village two said;

“This work that we are doing now, the owners of the land would definitely destroy it. Look, they are not here while we are working on their land. They do not work on it. We are the ones who laboured on this. Now when the time of the ploughing comes, they plough it. If they were part of the work, they would have protected the work from destruction” (V2-Ob-2).

There was one such instance that the researcher observed while in the field. The group assigned to a farm for the campaign wanted to do something that the owner of the land did not agree with. Usually, owners of the land are not allowed to stay around when the structures are built on their farm. This is to avoid resistance by the owners in case they object to the structures built on their plot. However, in this instance, the owner was persistent and forced himself into the work on his farm where he started insisting that the structures were taking a lot of land and that they were inappropriate given the layout of his land. The issue created a large commotion, the owner arguing that what was being done violates his constitutional right and the assigned group insisting that their duty was to do what they were told to do. The local leader intervened and tried to force the owner to allow the group to do their job. However, the owner refused and insisted that he won't allow the work to be done in the way it was being done. Seeing that the issue was creating a large scene, the leader finally decided to acquiesce to the owner on the modifications that he suggested but warned him to stay away from subsequent work on his farm. This was one extreme case, there were numerous other cases where the owners came and tried to argue with the people working on their land and

was told to stay away. Now, it is clear that knowing that their voice will not be heard is what drives people to destroy the structures.

In some of the sub-villages, the destruction had been very serious, cornering the local leaders between punishing offenders and being loyal to their community members. The leader of one of the sub-villages that the researcher observed said the following;

“During the first year, we worked in our sub-village watershed. We did a nice job. We mobilized our people nicely. The work was done on the hillsides and farm plots. We put PSNP (welfare) beneficiaries as guards. Higher officials praised the work. Over time, people started to plough close to the structures. We took a few to the social court and they were to be penalized. They begged me saying that they are going to be penalized while there are many other who did the same. When they beg me, I also begged the social court to excuse them and they were excused. Seeing these people excused and while the leadership attention was on something else, people started destroying the structures one after the other by ploughing until none is left. Now what can I do, can I take over 150 or so people to court? I live among the people, how can I take all them to court and have a life with them?” (V1-ID-1)

Other than active destructions, free grazing and flooding also contribute to the destruction of the structures. Irrespective of the motivation, the destruction of the previous year work was a serious demotivating factor for subsequent work. A female respondent lamented the destruction of structures her and her group had built the previous year saying; “Look, we went up to their place and develop their area, we get nothing for ourselves. Then people destroy what we did. That is just ignorance” (V1-IIR-5). Still another respondent said;

“What we do in the watershed work is just wasteful. People say nothing and let the development work done on their farm, but then they will destroy it latter. This will create more floods because it will get its way through the damaged structures” (V1-IIR-3).

In summary, although the people were subjected to unequal power relations with a state that has the political and economic upper hand, they found their own way of countering the state’s containment strategies. The counter containment strategies of the people seemed to serve two functions. On the positive side, these strategies helped local communities to avoid soil and water conservation practices which have no practical value or even have negative impact on their livelihood. The strategies also at times force the government to consider villager’s concerns in its subsequent programs. On the negative side however, the local resistance

affects both the quantity and quality dimensions of the resource management interventions. As a result of absenteeism, labour inefficiency and vandalism, the coverage of the watershed intervention was limited in the study areas. The performance difference in study village one and two can also be explained by the higher resistance of villagers in study village two compared to study village one.

5.4.4 When the state and the people agree: Environmentality of the people

As it was stated in the previous sections, the outcome of the watershed development intervention is a function of the struggle between the state containment and local communities' counter containment strategies. However, we also noted that the state strategies were not based purely on a command and control approach. Although there were some elements of soft coercion systems in play, there were elements of deliberation and compromises as well. This made it possible for the government to create a sense of self-regulated environmental concern, otherwise known as environmentality, among the community members. The environmentality of the community members was expressed in different forms such as embracing of government demands for the watershed development work, collaborating in self-control during the watershed campaign, and collective control of physical structures from destruction (Agrawal 2005).

In some instances, the villagers seem to agree with the government assertion of the need for collective action for the watershed development work. Some of the respondents argued that the watershed development work was essential for their collective wellbeing. They argued their case by citing positive outcomes of similar works in the past for their community. If it was not for the collective work, than what has been done so far would not have been possible. The following quotation illustrates the above argument;

“If we work on our private land alone, we will not have the advice of experts. Besides, if allowed to work individually, people will work only on their productive land, leaving the marginal lands. This work on the other hand gives us the chance to get expert advice and work on our marginal lands as well. So for me, I think if we work on degraded lands and hillsides together, it is fine. Maybe on our plain fields, we could work alone” (V1-FGD-4)

The strong argument for collaborative action came from two of the women respondents in study village one. One of the women, who has land in the irrigated area, said that although

her land was safe, she was still determined to work on other people farms since their gain was a gain for the village at large. She argued, “If people in our village are suffering, we all suffer and hence we work hard to assist others” (V1-IIR-5). Another woman respondent also said that the watershed work “is communal and beneficial for the whole village.” She further argued, “Unity is strength and mutual discussion is the solution for their problem.” As a result, she said that she attends community meetings and participates in the development work without being made to (VI-IIR-1).

Others also argued that they participate in the collective works because they believe that working collaboratively is the only way they can develop their village. “It is our village, and we want to change our village by working together” said one of the respondents (V1-IIR-6). She further said;

“The ones living here in my area do not benefit anything from the work we have done so far. We are working there because we are told to think as a country and save those who are in the lower catchment by working in the upper catchment” (V1-IIR-6).

The outcomes of the past interventions were also cited as an important source of inspiration for collective work. In one of the focus group discussions, one of the participants mentioned this point as;

“But look at the results; we are here now because of the work in the past. Especially the one made at the hillsides, it is serving us now with the trees grown. We would have been taken away by flood if it was not for the work done in the past” (V1-IIR-7).

Current reports from all levels, regional, zonal and district indicate improved performance in the watershed development work in the past five years. The best results were achieved in areas where the leaders and the people all embraced the importance of work and gave it their best. Interestingly some of these places were far from political centres and with rare monitoring from above. Nevertheless, in these villages large areas were covered by physical structures, the structures were complemented by biological measures, the soil moisture and water captured were properly used to improve crop productivity, the fodders planted were well kept and the enclosures were well managed.

5.5 Implications for adaptation with climate risks

This section builds on the riskscape identified in chapter four to see if the watershed development work contributes to managing the risk settings identified. As we have seen in chapter four, the ultimate benefit of the intervention should be improving food security and alleviating poverty. However, it is difficult to assess these issues as households' food security and level of poverty are a function of multiple factors, and the watershed development work addresses only part of the challenge. As a result, the assessment in this section focuses on the intermediate level benefits, such as reducing flood impact and soil erosion, improving soil moisture holding capacity, increasing water availability, and rehabilitating degraded lands and so on. The main argument is that if the intermediate benefits are realized, they will contribute to household food security and poverty reduction.

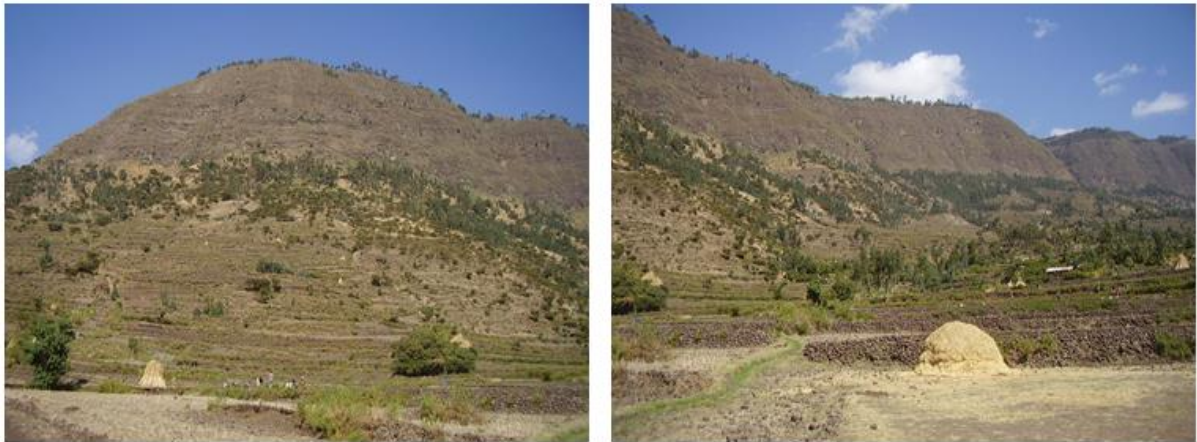
The interventions on hillsides include enclosures to control human and livestock interaction. Harvesting of products from enclosures such as grass and fodder trees is allowed only using controlled cut and carry system. The enclosures are also accompanied by soil and water conservation structures such as terraces, trenches and water percolation structures. Most respondents agree that the hillsides under enclosure show significant rehabilitation within a year or two. A respondent from study village one stated the following;

“The work is useful on the hillsides. We stopped free grazing and we planted trees on the protected area which is free from human and livestock contact. Because of this you can see it, the trees have grown, and the grass also grew very well” (V1-IIR-11).

The rehabilitated hillsides reduce surface run-off, contributing to a reduction in flood impacts especially in flood prone areas. In one focus group discussion, a participant stated “the hillsides were bare land and ugly. Now it is green and looks beautiful. It also reduces flood impacts for those living in the lower part of catchment of our village” (V1-FGD-2). One of the individual respondents also concurred on the benefit of the work done on the hillsides as he explains the benefits for his neighbourhood and his private farm plot;

“The work protected us from floods. The hillsides were highly degraded but now it is green and it looks nice. There was a time when that hillside used to be looted, now it is protected and the greening is a result of that. For our neighbourhood, the main benefit has been the protection from floods. We still have one river which brings us strong floods. Overall, however, we are better off. On my land as well, the floods

have reduced significantly. In addition, as the science tells us, when the mountains are covered with forest, it brings rain. We hope that the greening of the hillsides will bring us more rain and help us deal with drought” (V1-IIR-7).



(Source: Own photo)

Figure 14: Rehabilitated hillside, study village one

In both study villages, prior to the enclosure interventions, most of the hillsides were either on a communal grazing land property or on a de-jure private property that was de facto open land due to the difficulty of coordinating control. The enclosures allow strict control of hillsides for by the village administrations. Participants in one of the focus group discussions argued that the enclosures on hillsides also limit the rich from amassing more wealth from over exploitation of the open access grazing lands. Now, they argued, everybody grazes their livestock only on his or her land and they protect their land properly. If anyone trespasses on someone else grazing areas, he/she faces a fine.



(Source: Own photo)

Figure 15: Rehabilitated hillsides, study village two

Study village two had one of the best implementations of hillside enclosures in the district. The work was done through a USAID funded Project implemented by Amhara Micro-Enterprise Development, Agricultural Research, Extension, and Watershed Management (AMAREW) (2002-2007). The project provided financial compensation for farmers' labour, as they enclosed the hillsides and worked on soil and water conservation structures. One of the success stories of the project has been the organization the of hillside enclosure users association. The treated hillsides were divided and given to individuals who comprise this association in order to control the intrusion of humans and livestock and utilize the cut and carry system to harvest the products. Even after the phasing out of the project over the last 7 years, the enclosures are still intact and the associations were still strong during the time frame of the fieldwork. The enclosures address flood impacts and gully formations in the surrounding areas. Respondents also identified the enclosures as a critical feed source especially during seasons of feed shortage (V2-FGD-2).

On private farms, the benefit of the watershed work is seen from two dimensions. One dimension has to do with the collective approach taken for the intervention. One of the core constraints identified in past soil and water conservation interventions had been a labour shortage (Bewket 2011, 2007). The watershed development intervention which was done in public campaigns allowed those sections of the community who otherwise would not have enough labour to devote to conservation works to have proper structures on their farm if they had to do it themselves. One of the respondents whose farm was treated through the previous year's campaign said, "It was a work which I could not afford at all, if I were to get it done by myself" (V1-IIR-8). Many respondents also stated that one of the advantages of the campaign work was that even marginal lands that would normally be ignored by their owners also received proper conservation structures. Hence, the issue of incentive to invest labour and time on marginal land have been addressed by the intervention (Pender and Gebremedhin 2007).



(Source: Own photo)

Figure 16: Physical structures on farmlands, study village one

The second dimension of the benefits of the watershed development intervention is the tangible benefits realized due to the intervention. Those who view the intervention as useful frequently mentioned three sets of benefits. First, the terraces built on the farm plots trap the top soil that would otherwise be carried away by surface run-off. As a result, crops grown near the terraces performed better. The structures could also retain part of the run-off from the farm plot allowing more moisture to remain in the root zone of the crops. Confirming these effects, discussants in one focus group said “on the terraces where the soil and water is held, the crop perform better” (V1-FGD-2). Another participant agreed with the benefits of the physical structures and added that when kept well, fodder crops planted on the terraces could also be an important source of feed for their livestock (V1-FGD-1). When asked about the specific benefits that they saw from the work, one of the discussants stated that he used to plant his farm plot only with lentil, as he has no access to irrigation. After his plot was treated with the watershed work, he stated that his plot could retain better moisture, which enabled him to plant cash crops such as onion. Another discussant said that the work done on his farm last year was useful. He said his land was highly degraded and almost useless. “The work made my land useful again,” he added (V1-FGD-2).



(Source: Own photo)

Figure 17: Physical structures on farmlands, study village two

Some of the benefits of the physical structures are more meaningfully captured on the aggregate landscape level rather than individual plots. In one instance, the researcher observed a bench terrace structure that was under construction on a steep slope and a degraded farm plot. For the plot on which the work was done, the structure might not be useful to conserve moisture as the land immediately next to the structure belonged to another person. The farmers who were working on the structure during the campaign argued that the work is indeed useful for the plot as the land was wasted due to erosion. However, they added that the main beneficiaries of the work done on that particular land would be the farmers downhill from that plot, as they would avoid run-off from the upper plot. Hence, they argued that the utility of the watershed work is seen at the landscape level, not necessarily for a specific individual plots. They also argued that for such a landscape level impact, all the structures made should be maintained well (V1-Ob-6). The following quotations from two of the female respondents summarize the benefits of the watershed work and its importance in dealing with climate risks;

“It is because of the watershed development work that we did in the past that the weather in our area is getting cooler and better. Those farm plots which were thin are now thick. The land which was degraded is now rehabilitated. The main benefit of the work is on places where flooding was a serious problem, it has improved now. The farmlands in these areas are also benefiting a lot from the better weather around. Overall the work is better than nothing. Even if small, it holds some water and it should be useful during moisture stress time” (V1-IIR-5).

“We used to have heavy flood, now we are fine, there are a few but the floods have decreased significantly. I have not seen the benefit of the watershed work in coping with drought though. The watershed work is not done yet on our farm, but it has been done on others land. They are protected from floods. The work also improves our water resource. If the water resource of our area develops, we will get water within a closer distance. It will save us a lot of time spent fetching water from far distance. We the women are strong participants in the work. The work cannot be successful without the participation of women. Of course we are working longer hours than the men as we have household responsibilities as well. The additional work on the watershed is difficult. The watershed work cannot be successful without the active participation of the women” (V1-IIR-1).

However, the research also identified limitations of the intervention, both in terms of technical problems and shortcomings in the approach that it used. In one field observation in study village two, one of the farmers working on the campaign told the researcher, “If they tell you that these structures are useful, do not believe them.” He reasoned, “Our soil is deep, it could go down a lot of meters. When it gets water, it drains it down. It does not stay at the root level. Even if we have a meter of water stored during the rain, it won’t stay. It goes down.” He went on to say, “Such structures could be useful in the highlands where the depth of the soil is shallow. There if it rains heavy, the soil saturates and retains the water for later use. But here on our land, it goes down to the water table” (V2-Ob-2). Hence, the conservation structures made on farm plots in this village could hardly conserve moisture for a useful amount of time.

In study village one as well, the researcher asked a group of development team members who were on duty during the campaign work about the utility of the work they were doing on a specific plot on which they were working. They debated amongst themselves on whether the watershed work was useful or not. Some said that they had learned that when one structure holds water at one level, the farm at next level could benefit from the transfer of the conserved moisture. Others say that the structures hardly conserve moisture, arguing that they have not seen the results on the plots that were treated during the previous year’s campaign. For the plot they were working on, some said that the structures hold some water but they added that since the soil is a clay soil, heavy rain could actually cause serious waterlogging

(V1-Ob-7).

One of the technologies introduced by the intervention was suck wells. These are small water harvesting structures dug at the head end of farm plots in order to capture run-off flowing along the slope of the farm plot. The idea is that the water captured in these structures would slowly percolate down the slope of the farm plot, providing extra moisture for the farm plots. Some of the respondents argued that although they tried it on their own farm, they had not seen the benefit of these structures. One of the respondents said, “They also told us to dig water harvesting pits at the head of our farm plots, but that does not help us much. The water stored does not really reach the root zones of our plot” (V1-IIR-8; V1-IIR-11).

In regards to flood and erosion protection, especially on farm plots, some respondents argued that the benefits are context specific. They argued that for some farms, the structures could actually cause more floods. One respondent stated, “Unlike what we were told, the watershed work is actually causing more floods. The structures hold water, and when it bursts at one end, it causes a lot of damaging floods” (V1-IIR-3). Another one added;

“It is increasing, flood is increasing. This place had no floods. Now, the floods are increasing, taking away our land. When it is dry, the soil gets fragile and when it rains, the water takes the whole soil. In the previous works we did not work from the inlet, of course now, we are improving on that. In any case, when all of us do the conservation work, we are holding the water. However, none of the water is made to drain into the river. Rather, everybody holds the water on their farm. When a burst happens in one of the farms, it creates a lot of flood with high pressure. So, for me I haven't seen any benefit because of the conservation work especially in the farm plots” (V1-IIR-11).

One of the factors that reduces the utility of the structures is their poor design. In study village two especially, some of the structures were constructed in a freshly flooded area without any reinforcement other than the soil beds. Farmers seem to understand this problem as the researcher observed them debating it. Two issues seem to contribute to the problem of poor quality of work. One is neglect by the farmers, as they know that the owner will not appreciate what has been done and might even destroy it. Second, there was no overall layout at the watershed level. Rather, the everyday practice was that each development team would concentrate only on the portion of work given to them according to the daily work norm. As

long as they finish their allocated work assignment, they did not seem to worry about the overall linkage of the structures in the watersheds. Members were expected to work on six-meter portions and no one seemed to check on the implication of what has been done to the natural water flow. This problem was expressed in a focus group discussion as follows;

“The farm terraces are important to hold the water and prevent soil erosion. The problem with the work on the farm is, unless it is designed carefully, it could create more flood than it could avoid. But given the poor quality of work we are doing now, we doubt that the work would have any significant benefit” (V2-FGD-2).

Other opponents of the watershed work argued that although the watershed work has some benefits, it could neither transform their life nor protect them against drought. “Despite the claim by the government experts,” one of the female respondents argued, “the watershed work does not as such help with dealing with rainfall variability or drought” (V1-IIR-5). In a focus group discussion in study village two, discussants expressed the limitation of the work as follows;

“Well, the work is better than nothing. Of course, it will not save us if we face bad weather. The water that it holds is not enough to withstand drought. Sometimes it is just a waste of time. We are doing this out of desperation, not really because it could transform us” (V2-FGD-2)

There were also those who argued against the intervention due to the overall approach that it used. There are two variants of these opponents. The first are those who oppose the watershed development project outright. Watershed development work is often presented as scale free intervention in terms of the benefits generated for communities in a certain watershed. However, in contexts where topographies are undulating and land use property rights are fragmented, the benefit generated for one farm might be at the expense of another farm. While some farmers benefit from erosion protection, others might suffer from either excessive flooding or loss of fertile sedimentation. Hence, if the watershed work is to have benefits for private farm plots, it must be complemented by structures which are tailored for each of the individual farm plots. However, this notion does not have a place in the one size fits all approach of the current intervention. This limitation of the intervention was more pronounced in study village one because of the stark elevation variation within the village (V1-IIR-1, V1-IIR-6, V1-IIR-11).

The second approach related problem of the watershed intervention is the top-down decision-making process. There were two further problems with this issue. On the one hand, because of the collective nature of the public campaign, farmers invest their energy and time in watersheds that have no ecological connection with their farm. The incentive mechanisms found in conservation literature such as payment for environmental services are replaced by the government capacity to force people to work for the sake of their village and national development they are told, in areas where they have no material interest. This practice comes at cost, however. Often farmers derail the work through either absenteeism or delivering poor quality work during the campaign.

The top down approach also failed to correct past mistake or learn from previous experiences. Local communities criticized conservation measures introduced in the past for taking up too much productive space. People argue that the structures take a lot of productive space, which the researcher estimated to be up to 2 meters per contour. In a farm plot there could be two or three contours. In areas where one of the risk settings identified was land shortage, farmers find it very difficult to accommodate these structures. Despite these complains, the government experts continue to push these technologies in mass. This leads to the frustration of farmers and hence, large scale destruction of the structures on farm plots to the extent that it starts discouraging others from engaging in the watershed development campaigns. In an informal discussion with a team of farmers working on the campaign, the researcher asked them what they felt the benefits were of the work that they were doing on that particular farm. Some argued that despite the utility of the work, their effort would soon be wasted as the owner would destroy the structures (V1-Ob-7). The following quotations of two respondents show this problem;

“For the structures made on private farms, we are just tiring ourselves. We have been working hard, but because the structures take a lot of space, the owners of those lands will start ploughing them little by little until they are all destroyed. Besides, when the structures hold water and the farmer ploughs close to them, it causes a very destructive flood. One day of rain could destroy the whole structure because of the sloped nature of the land” (V2-IIR-6)

“The government says soil and water should be conserved. We agree with what the government says. We can improve our productivity and the water resources of our village could be improved by the conservation work. However, we also think for

today, we have very little land. We are already complaining that our land is too small. Now these structures on the farm take up to two meters. You know, we say if only we plough this part and plant it with two or three lines crops. Traditionally we used to have stone bunds . However, usually it does not hold the water. When there is strong water, it is destroyed. The new structure is good now. It holds water as well as soil. Nevertheless, it takes a lot of space and because of this, people destroy it (V1-ID-1).

Even the enclosures, which are widely considered the most praised part of the watershed development intervention, have some critical limitations. Some community members objected the establishment of the enclosure. These are farmers with no property rights, either communal or private, in the enclosure sites. They argue that the enclosures made their livestock rearing a difficult task. There is a 50 birr fine for each livestock that enters the enclosures in both study villages. The community was told to hold their livestock at home and use a cut and carry system to feed their livestock. One of the respondents lamented;

“There are places where the land is given to individuals. However, they are not allowed to graze inside that as well. They are also not allowed to cut the grass before September; even then, it should be seen and approved for cutting. They cannot cut before that. They are allowed to cut the grass only after the grass drops its seeds for the subsequent season. If one says, it is my mountain and I can do what I want, they get penalized. This is what is spoiling our relationship. People say that they are forced to engage in development activities against their will. They complain that they are made to go out for the watershed work, use improved technologies, and contribute money for local development activities, all against their will (V1-IIR-11).

There was also self-criticism on the government side. Reviewed document from the region, zone and district agricultural offices indicate that although enclosures contributed to land rehabilitation and the greening of the environment, their impact has been significantly low. The enclosures left for natural regeneration in many cases ended up growing vegetation with no economic value. Efforts to introduce eco-based economic activities such as bee keeping did not materialize as well (ARAD-2, NWZAOD-1, and GDAOD-1). The documents also recognize a general failure of the interventions that focus on physical work with few tangible improvements in water harvesting, irrigation development and fodder development. The reports also warned of the neglect of watersheds made in the past as well as a wide-spread trend of destroying physical structures on private farm plots (ARAD-1, ARAD-2 ARAD-5, NWZAOD-1, NWZAOD-2, NWZAOD-3 and GDAOD-1).

In summary, the watershed development campaign managed to mobilize a huge number of rural residents for collective soil and water conservation works over the last five years. This resulted in a huge coverage in terms of the total areas of micro watersheds treated with different soil and water conservation structures. The village level analysis showed that the benefits attributed to the watershed work are related to its ability to mobilize mass labour for work that could otherwise be difficult to do with private individual labour. The intervention also exhibited its benefit with the way it controlled resource use in hillsides through enclosures, reduced flood impact, and conserved soil and water especially along the farm terraces. However, some argue that the usefulness of the watershed work is limited by the inappropriateness of the structures, poor design of layout of the structures, and the destruction of pre-built structures.

5.6 Interim conclusions

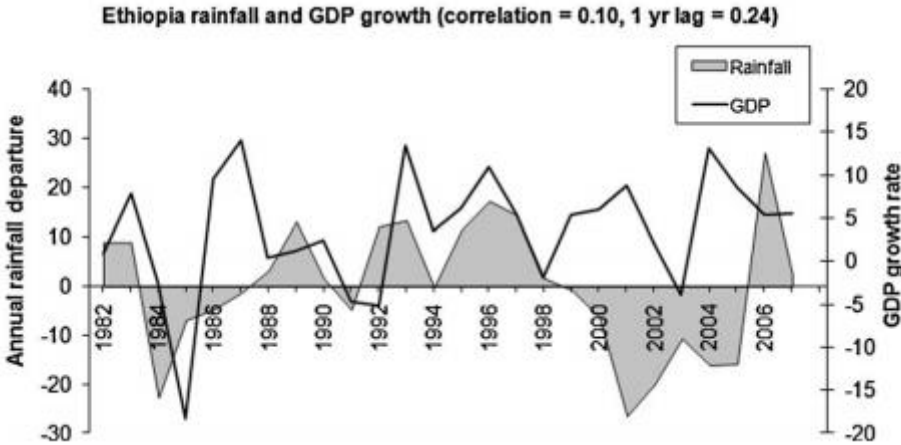
As we have seen in this chapter, interventions on natural resource management and adaptation with climate risks have been historically present in Ethiopia. This is because natural resource management interventions have always been politically driven. They often involve bringing rural communities and the state together for cooperation. However, this cooperation is not among equals. Taking the current watershed development intervention as an example, we have seen that behind the large coverage and huge mobilization of rural people in the national watershed development campaign in Ethiopia is the hegemony of ‘developmental state’ ideology as well as elaborated and well-orchestrated governmentality projects of the state. Nonetheless, ordinary citizens also have the power to resist. This often passes unnoticed by politicians or even when it is noticed it is extremely hard to control. This case study shows that depending on how the hegemony and governmentality projects of the state are received by local communities, the impacts of watershed intervention differs from place to place. In some places the state intervention allowed local communities to coordinate their action and rehabilitate their degraded land, conserve their soil and water, and improve their livelihoods. In other places, the state interventions face serious resistance, which results from a failure to coordinate actions with local communities for the watershed development work even when the potential benefits are acknowledged. These findings demonstrate that adaptation measures cannot be thought of as mere technical solutions. The process that brings these technical solutions into effective implementation is both political and social. Understanding this process is as crucial as understanding technical and ecological dimensions of adaptation.

Chapter Six

Adaptation Action Coordination: The Case of Irrigation Management

6.1 Introduction

Ethiopia has a total land cover of 1.13 million km², out of which with 513,000km² is arable land. The agricultural sector accounts for 43% of its GDP and 90% of its export earnings. Cereal crop production dominates the agricultural production, accounting for 70% of the agricultural GDP. Over 90% of the agricultural GDP also comes from smallholder farmers, close to 55% of them farm on land that is a hectare or less in size (MoARD 2010). The dependency of the agricultural sector on rainfall left millions of Ethiopians in poverty and food insecurity. Historical records shows that the national economy fluctuates up and down following drought years (Conway and Schipper 2011, see Figure 6.1). This trend is expected to be exacerbated by the potential impacts of climate change, whereby national projections show the possibility of more variability in rainfall across the country (Awulachew and Ayana 2011; Hagos et al. 2012; MoARD 2010a). World Bank estimates shows that, if left unmitigated, the current hydrological variability could increase the national poverty rate by about 25% and reduce its economic growth potential by about 40% (World Bank 2006).



Source: (Declan Conway and Schipper 2011)

Figure 18: Rainfall and GDP relations in Ethiopia (1982-2006)

The paradox is that Ethiopia also has a huge water resource potential which should enable the country’s agricultural sector to break its dependency on rainfall. The country has 12 river basins with an annual runoff volume of 124.5 km³, and ground water potential which is estimated to be 2.5 billion to 30 billion cubic meters. While the surface water irrigation potential of the country is 5.3 million ha, the ground water irrigation potential is estimated to

be 1.1 million ha (MoWR/World Bank 2011; Awulachew 2010). Despite this huge potential, the actual utilization of the country's water resources so far is negligible, a total of only around 700,000 ha (van Steenberg, Kumsa, and Al-Awlaki 2015a).

There are renewed efforts to expand the irrigation coverage in Ethiopia. Huge investments have been pumped into large, medium and small-scale irrigation interventions. These interventions envisage a better capacity of the agricultural sector to withstand climate risks and contribute to the national economic growth. These investments are also increasingly mentioned as the main adaptation strategy against climate change in the agricultural sector (FDRE 2015). However, as is the case elsewhere in the world, irrigation interventions in Ethiopia are trapped in what is called the 'hydraulic mission' (Molle, Mollinga, and Wester 2009) whereby decisions are often based solely on hydraulic engineering considerations, downplaying the social and political dimensions.

Critical studies on irrigation on the other hand, emphasise the importance of considering social and political dimensions in order to understand the implications that irrigation interventions would have on local communities. For example, the work of Eguavoen and Tesfai (2012) showed that irrigation interventions are not necessarily beneficial for everybody in a community. While it might improve the lives of some, others can be impoverished due to irrigation interventions. A related study by Eguavoen et al. (2012) also argued for the importance of the scale of the irrigation interventions, as they found small scale interventions allowed for a smooth transition from rain fed to irrigated agriculture for smallholder farmers' compared to large scale interventions. Mollinga and Bolding (2004) also argued that irrigation reforms in developing countries are inherently political, with the state playing a central role in their development and management. It is also argued that irrigation development in Ethiopia is a highly political issue, with the Ethiopian State having a formidable influence on major decisions (van Steenberg, Kumsa, and Al-Awlaki 2015b; Bues and Theesfeld 2012).

This study also aims at expanding the critical views on irrigation management as a strategy for adaptation with climate change. Together with chapter five, the research question for this chapter is "In what ways are actions for adaptation coordinated among the state and local communities and how does this influence the effectiveness of adaptation actions?" The specific case study selected is the Kobo-Girana Valley Development Program (KGVDP). The

KGVDP is a ground water based irrigation management program in the Kobo and Girana valleys in Northern Ethiopia.

The chapter is organized in seven sections. Section 6.2 introduces the basic institutional structure of the KGVDP. Section 6.3 looks at the reason why action coordination is required in irrigation management. Section 6.4 looks at the containment strategies of the state in its attempt to coordinate irrigation management actions, mainly the way that the hegemony and governmentality projects of the state are reflected in the irrigation management. Section 6.5 focuses on the counter containment strategies of local communities in their resistance against state actions. Section 6.6 presents the implications of the struggle between the state and local communities for climate proofing and the economic transformation of smallholder farmers. The final section provides the interim conclusion of the chapter.

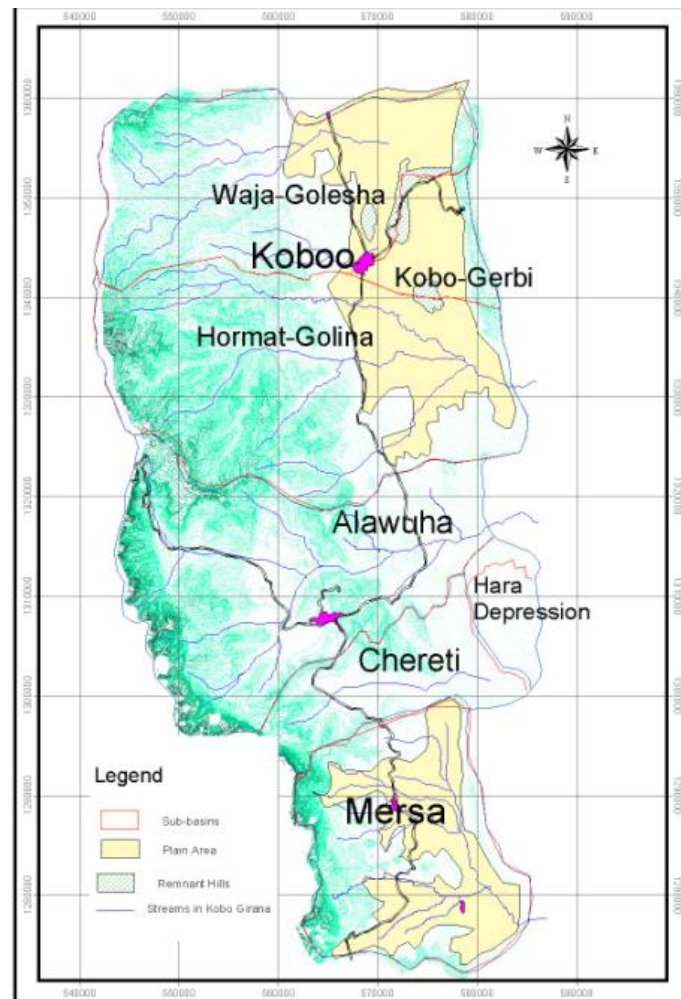
6.2 Institutional Structure of Kobo Girana Valley Development Plan

The Kobo Girana Valley Development Program (KGVDP) is found in the Kobo-Girana Valley, which stretches over 2849.5 km², in Habru, Gubalafto and Gidan districts, in Amhara Regional State. It is one of the pioneer ground water based irrigation projects in the country (van Steenberg, Kumsa, and Al-Awlaki 2015b). The valley has a total of 29760 ha of irrigable land, both with surface and ground water sources. The annual recharge rate of the valley is estimated to be 170 million cubic meters, with the potential of irrigating 16500 ha from the ground water source. Until the 2013/14 budget year 112 wells were dug, with 57 of these continuing to the construction phase. Out of these 33 projects¹⁴ were operational during the same budget year, with a command area of 1381 ha, and 4105 beneficiaries.

According to documents obtained from the KGVDP office (KGVDP-6), the program was first established in 1999 with proclamation number 10/1999 by the Amahara National Regional State. Initially the program focus was wide, including development of crop and livestock production of the area, natural resource management and irrigation development. However, the organization was overwhelmed by its mandates not to mention that most of the mandates were duplicating the day-to-day operations of the Kobo District agricultural office. As a result the program was reorganized in 2011, with proclamation number 77/2011 (CARS 2011). The mandates of the new organization are currently:

¹⁴ A project means individual irrigation scheme with an average command area of 50 ha and 160 beneficiaries

- To reduce the recurrent food insecurity problem of the area through promotion of appropriate and effective irrigation management
- To improve the livelihood and income of the people in the area through promotion improved and market oriented agricultural production
- To facilitate cost recovery of the program investment and
- To ensure the maintenance and operation of irrigation projects in the valley (CARS 2011).



Source: (MoWR 2008)

Figure 19: Location map of Kobo-Girana Valley

This is interesting for two reasons. On the one hand, it shows the political will of the state to transform the subsistence and drought prone farming system. On the other hand, it also raises the question of financial sustainability of such initiatives as all investment costs are borne by the state. As we will see it in the coming section, the fact that the regional government bore

all the investment costs gave it wide discretion in decisions about the economic direction of the areas under irrigation.

At the regional level, a board with the President of Amhara Regional State as board chair leads the program. There are seven members of the board, the regional water bureau head, the agriculture office head, the finance office head, the president office adviser, the zone administrator, the regional TVET (Technical and Vocational Education and Training) head and the KGVDP office head. The board is responsible for allocating the budget and overseeing the overall functioning of the program. An interview with the head of the KGVDP and other experts in the program office showed that the board meets more or less regularly handles the program matters properly (KGVDP-KII-6, KGVDP-KII-2). This shows a presence of strong political will to support agricultural transformation in the valley. This support allowed the program office to have a sufficient annual budget to pay a premium salary for its experts and allow them to have enough mobility within their project sites.

At the operational level, the program is led by a steering committee, which includes members from Kobo District Agriculture Office, Amhara Water Works Construction Enterprise Kobo Branch (AWWCE), the District Administration, the Police, Justice Offices, and the Ethiopian Electric Power Corporation Kobo Branch (EPCO). The steering committee was established to handle operational matters that require intervention from the sector offices in the District. Interviews with the program office experts, however, showed that the steering committee is too weak. It does not meet regularly and it does not adhere to the decisions that it makes (KGVDP-KII-6, KGVDP-KII-2). This creates a system wide problem as a failure of coordination among the sectoral offices poses a threat to the day to day functioning of the irrigation management works at the local level.

6.3 The need for action coordination for irrigation management

It has long been recognized that irrigation requires strong action coordination mechanisms among the actors involved in its management (Meinzen-Dick 2014; Ostrom 1992). This is especially true in irrigation schemes where the beneficiaries are small holder farmers operating on their private plot that share water for irrigation. In situations where the state has a strong stake in the development and management of irrigation schemes, action coordination must happen not only among irrigation users but also between irrigation users, expert, and

political decision makers at different scales (Molle, Mollinga, and Wester 2009; Mollinga, Meinzen-Dick, and Merrey 2007). The specific model for managing coordination might differ from context to context (Meinzen Dick 2014). What is important is to recognize that the effectiveness of an irrigation intervention depends on the smooth functioning of the coordination mechanism in places across scales (Mollinga and Bolding 2004).

In this case study, action coordination involves the coordination of action among irrigation users, among different government sector offices at different scales, among irrigation users and government, and among irrigation users, the government and market actors. Coordination is required to undertake relevant actions such as water distribution, organizing farmers, agricultural extension service provision, marketing, and operation and maintenance. Below is a brief description of these activities.

Water Distribution: With its re-establishment in 2011, the regional government mandated the KGVDP to take over completed irrigation schemes from the Amhara Water Works Construction Enterprise and manage the operation of the schemes. This involves managing a fair distribution of water among users. The irrigation schemes use electric power from the main grid to pump water from the ground. The electric power provider is the Ethiopian Electric Power Corporation (EEPCo). Water distribution is managed by irrigation user cooperatives organized around each irrigation project. Every irrigation project is further divided into blocks and water user groups. At the plot level, the schemes use three water distribution technologies, namely, furrow, drip, and sprinkler systems. The program works using a cluster production approach whereby all water users in a particular irrigation scheme plant only one type of crop. In some cases, the command areas would be divided into two clusters and the farmers in each cluster plants only one particular crop. This strategy is important for water distribution as it makes water distribution schedules fair and easy.



(Source: Own photo)

Figure 20: Water distribution technologies at plot level

Organizing Farmers: There is no panacea for organizing irrigation management, as different mechanisms including the state, water users, and the market, perform differently in different contexts (Meinzen-Dick 2007). The KGVDP irrigation schemes use a mix of state and water users associations for irrigation management. The program office is legally mandated to manage the overall operation of the irrigation schemes as well as the delivery of extension services. However, it delegates part of its daily operations to farmers cooperatives organized around each of the ground water irrigation schemes. Using the available data on 18 such schemes, the average command area of each scheme is 50 ha and the average number of water users in each scheme is around 165 farmers. The by-laws of the cooperatives state that the cooperatives are mandated to take over ownership of the schemes, ensure a sustainable and reliable water supply for members, provide production inputs with the required quantity and price as well as search and link with better markets. In addition, the cooperatives are also tasked with collecting water fees, providing transport and storage

services, preparing a planting schedule, maintaining the quality of its member's products, providing members with production credit, and providing members and people in the surrounding areas with education and training. Membership is open for all farmers whose land falls within the command area of the ground water irrigation schemes. Hence, in principle, membership is open and based on the willingness of the farmers within the command area.

Extension Services: The national government has been undertaking ambitious agricultural transformation interventions in accordance with its 'developmental state' political ideology. In this regard irrigation development has been one of the core components. The government has been promoting irrigation to ensure food security and foster economic growth (MoWR 2002). The basic argument is that by expanding irrigation, not only will farmers be able to withstand climate risks, but they will also be able to use improved agricultural technologies to improve their productivity (MoA/ATA 2014). Accordingly, the KGVDP has been given the mandate to provide extension service on improved agricultural practices to irrigation users.

Operation and Maintenance: One of the mandates of the KGVDP is operating and maintaining the irrigation schemes. To this end, it has a section in its organization structure with technical experts that deal with maintenance issues only. The cost of maintenance is divided between the irrigation user cooperatives and the program office. While the office pays for the salary of its maintenance experts, the cooperatives buy the necessary accessories and materials needed for maintenance.

Marketing: The last, mandate of the KGVDP is assisting farmers with getting access to agricultural inputs and finding better markets for their produce. The marketing function requires coordinating a production process suitable for marketing, linking farmers with markets, and managing the transaction process, a function which features both economic and cultural dimensions. This also involves assisting farmers with selecting marketable products and producing them in large quantities to attract a bigger market.

The activities listed above require strong action coordination among irrigation users and between irrigation users and the state. However, as in other developing countries

(Meinzen Dick 2014; Mollinga and Bolding 2004), the state is the strongest actor in irrigation management both because it is the sole source of the irrigation investment and it has more political influence compared to local communities or other actors. As a result, it is important to understand how the state attempts to manage the action coordination component of its intervention (van Steenbergen, Kumsa, and Al-Awlaki 2015b).

This does not mean, however, that the state is in exclusive control of action coordination mechanisms. Not only does the state need the cooperation of local communities to execute its actions, but in fact, people have the power to influence state actions (Scott 1985). Hence, irrigation coordination in the Ethiopian context in general and the study area in particular can be understood to be a result of a constant struggle between the containment strategies of the Ethiopian state and the counter containment strategies of local users in the management of irrigation water resource (Few 2001).

Hence, this study approaches the irrigation management in the study area as a socio-political problem involving irrigation users, the government at different scales and market actors. This requires an understanding of the state's use of hegemonic projects of 'developmental state' ideology to contain the irrigation management process and its governmentality projects that serve as a mechanism of translating the developmental ideology into coordinated action. It also requires an understanding of the counter containment strategies of local communities in their resistance against state action in their everyday life. The next section will look at the impacts of this action coordination mechanism on the ultimate objectives of the irrigation intervention: climate proofing and transformation of the subsistence agricultural production system in the study area.

6.4 State's containment strategies as action coordination mechanism

6.4.1 Action coordination through hegemony

The Ethiopian government, under the ruling party EPRDF, is a self-declared 'developmental state'. The EPRDF frames poverty as the ultimate enemy of Ethiopia which requires aggressive state economic intervention to be defeated. It depicts failure to embrace developmentalism as a transgression with apocalyptic consequences such as famine and national annihilation. For this, the EPRDF uses militaristic terminology such as "war against

poverty”, “developmental army”, “development patriotism”, and “developmental hero/heroine” to describe the sort of hegemonic consensus that the party wants to see develop among party members and the public at large (Gebresenbet 2015:70; Vaughan 2011). In smallholder farmers’ context, state developmentalism meant enlisting rural communities to be selected priority areas of national development targets set by the government. The two notable recent five year plans, the Plan for Accelerated and Sustainable Development to End Poverty (PASDEP) (MoARD 2006) and the Growth and Transformation Plan (GTP) (MoFED 2010) envisaged a large scale mobilization for national development. GTP especially was the most acclaimed and ambitious even by the standards of the ruling party. Hence, the ‘developmental state’ hegemony projects require citizens to fully embrace the state policy and work towards achieving the nationally set targets (de Waal 2013).

Concomitantly the water sector took a centre stage in Ethiopia’s ‘developmental state’ agenda following the 2002 water sector development program, where irrigation development has been one of the priority areas (Eguavoen and Tesfai 2012; MoWR 2002). Both the Water Resource Management Policy (MoWR 1999) and the Water Sector Development Program (MoWR 2002) explicitly address irrigation issues. They mainly focus on the national priorities of ensuring food security, poverty reduction, and stimulating economic growth through irrigation. The national water sector development program states;

“Irrigated agriculture is important in stimulating sustainable economic growth and rural employment and is the cornerstone for the food security and poverty reduction national agenda” (MoWR 2002:44).

While the national water sector program planned to put an additional 273,829 ha of land under irrigation coverage from the base year coverage of around 200,000 ha in 2002, the performance up to 2010 showed an addition of more than 400,000 ha, making the total coverage close to 700,000 ha (Seleshi Awulachew 2010). A recent document on household irrigation, shared by the major actors in the agriculture and irrigation sectors such as the Ministry of Agriculture, the Agricultural Transformation Agency, and the International Water Management Institute, states that household irrigation has a potential of helping 650,000 farm households double their production, and increase their income from USD 147/ha to USD323/ha per year. This, it is argued, not only ensures food security but also catalyses economic growth (MoA/ATA 2014). In the Amhara Region, where this study was conducted, the GTP of the region targeted an increase of irrigable land coverage from 32726

ha to 245,642 ha, out of which the share of the Federal Government investment was 45.76 % (112, 424 ha) (BoWRD 2011).

Note that major documents such as the Water Resource Management Policy (1999), the Water Sector Development Strategy (2002), and the Ministry of Agriculture/Agricultural Transformation household irrigation working strategy (2014) are based on hydrological and economical narratives. These narratives are based on the water resource potential of the country, with 12 river basins and huge ground water potential. The core problem is taken as a hydraulic engineering challenge of withdrawal and storage of this untapped resource. Once the engineering problems are solved, the narratives claim, the next problem is turning this potential into an economic value that would boost the national level of food security and economic growth. These narratives suit the existing ‘developmental state’ ideology of the Ethiopian state. A critical view on irrigation management in Ethiopia on the other hand reveals interesting features of the state hegemony, both positive and negative in terms of influencing the effectiveness of the irrigation management.

In the case of the KGVDP, the political dimensions of the irrigation management operate at different layers (See Figure 22). The first layer is the overall political environment, where the development state ideology of the federal government prevails in every development programs of the government at different scales. As a government sponsored and led program, the KGVDP is expected to align itself with the overall political environment. For example, one of the quarterly reports of the KGVDP states that the program aims at contributing towards realization of the GTP of the country by pushing farmers to improve their life and contribute to market stabilization to the nation at large. In addition, by aligning itself with the ‘developmental state’ ideology of the national government, the report states that the key strategy to achieve the program objectives is to build a developmental army among its own experts and the target beneficiaries of the program (KGVDPD-3).

In the second layer is the regional government. The regional government brings its influence by acting as the channel for the national government ‘developmental state’ ideology as well as covering the cost of irrigation infrastructure and the KGVDP’s operational budget. Taking into account the ground water potential of the valley and the recurrent drought in the area, the regional government initiated development of ground water based irrigation schemes in Kobo-Girana Valley. Although it was hard to find an exact figure, the total investment cost

was at minimum, 300 million birr over 10 years period, based on an estimate of one of the key informants project engineer (AWWE-KII).

The initial stage of the irrigation development in the valley was a typical hydraulic mission oriented approach (Molle, Mollinga, and Wester 2009), whereby the regional government went straight into construction without proper consultation with local communities. The construction process involved surveying the ground water potential in the valley, digging test wells, digging the main well, and constructing the water distribution system. When all these activities were done farmers had no knowledge of why and for whom the work was being done. One of the respondent farmers said;

“Well, when the project was under construction, we didn’t know what they were doing. We were so mad when the construction was being done on our farm. We kept quiet only because it was something from the government” (V4-IIR-4).

As a result, local community members developed suspicion and rumours that the government intended to take away their land and give it to investors. This was not an unfounded fear, as a large part of the land in the valley had been given out for large scale investors. In one focus group discussion, one discussant stated; “Initially, when they were building the structures, we thought that the government was going to take away our land” (V4-FGD-1).

Things improved overtime as the completed irrigation infrastructures were transferred to local communities, alleviating the suspicion that the government might take the land away from farmers. However, the construction process remained dominated by technocrats from the regional government, mainly from the Amhara Water Works Construction Enterprise. Interviews with beneficiaries and reports of the KGVDP program repeatedly lamented the poor design and construction quality of the newly constructed irrigation schemes (V4-FGD-1, V4-IIR-1, KGVDPD-4, KGVDPD-5).

Apart from covering the cost of irrigation infrastructure, the regional government also pays for the annual operational budget of the KGVDP. The apex body of the program is also a regional board, comprised of seven members, including the regional water bureau head, the agricultural office head, the finance office head, the president office adviser, the zone administrator, the regional TVET head, and the KGVDP office head. An interview with KGVDP participants indicated that the board often meets regularly as development the Kobo Girana valley is one of the priorities in the region (KGVDP-KII-6). The board provides

strategic directions for the program, making sure that its activities are aligned with major national and regional developmental targets (KGVDPD-4, KGVDPD-5). At different times the regional government also showed its desire to use the program as one of the growth corridors of the region. For example, the regional agricultural office attempted to promote commercial production of cotton and beans at different times in accordance with the regional agricultural transformation agenda. There was also an attempt by the regional government to use the beneficiaries as producers of improved teff seeds. However, most of these regional initiatives were not successful.

The third layer of the state involvement comes from the KGVDP establishment proclamation and its relationship with the local government at the district level. As discussed in section 6.2 the KGVDP was established by regional proclamation (CARS 2011) to promote irrigation management, improved market oriented agricultural production, and maintenance and operation of the irrigation projects in the valley. In this sense it is an autonomous organization, conducting itself as more of a professional service compared to the district agriculture office. The program office is supposed to work in Kobo, Habru and Gubalafto districts as the valley extends across the three districts. However, at the time of the field work for this research, the program was confined to the Kobo District.

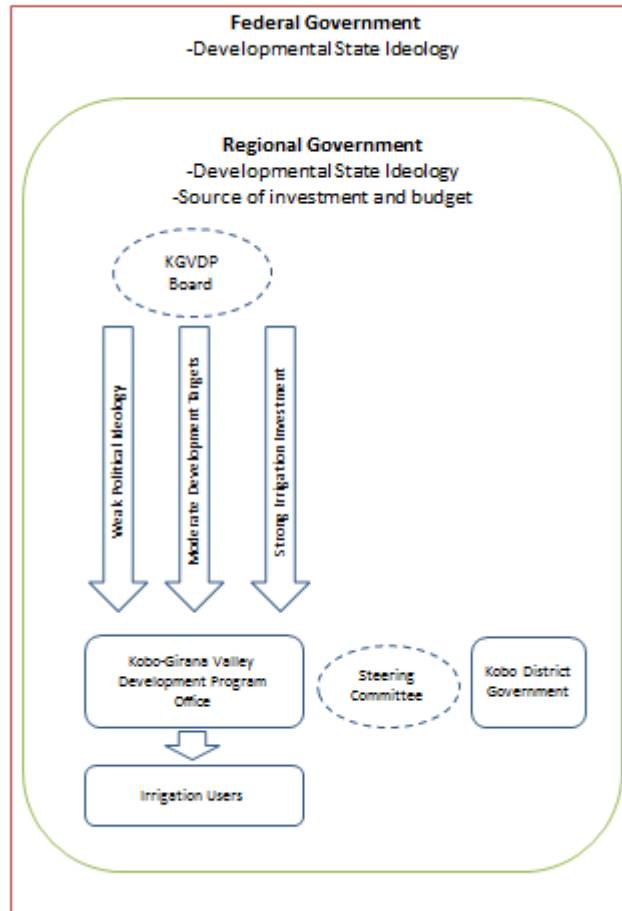
At the program level, the KGVDP works under the oversight of a steering committee whose members include the district police, justice, administration and agriculture offices, the Amhara Water Works Enterprise, and the Ethiopian Electric Power Corporation (KII-6). The chair of the steering committee is the head of the district government. However, interviews with experts and a review of KGVDP documents indicate that the steering committee failed to meet regularly and make a concerted effort to alleviate the structural problems of the program (KGVDP-KII-6, KGVDP-KII-2, KGVDPD-5, KGVDPD-4). Problems related to construction design, quality, as well as electric power shortage and interruption remained the biggest challenges facing the program. These were issues that were supposed to be resolved by the steering committee but were not (KGVDPD-5, KGVDPD-4). The only meaningful relationship among the steering committee members to the KGVDP is with that of the district agriculture office, but that was still limited to taking quotas of improved technology from the district agriculture office and reporting back at the end of the year. In general, because of the professional nature of the KGVDP mandates, it had no political mobilization capacity at the

operational level, neither it was well linked to the local level political mobilizations of the state.

Such a weak coordination at the operational level among the different government sector offices creates an implementation gap between broader political ideologies and targets of the state on the one hand and actual implementation on the other. The program office adopts the government developmental political ideology and accepts regional and district targets for use of some agricultural technologies such as improved seeds, fertilizer, and row planting. Implementation of these practices, however, is left to the program experts. Unlike the agricultural extension activities by the district agricultural office whereby political ideologies and different forms of organizations are used to motivate and mobilize farmers to take up agricultural technologies, the program experts are equipped with only their expert knowledge and regular contact with farmers. Beneficiary farmers were exposed to the government political mobilization only when they attended meetings related to their rain-fed farming plots. This creates a discursive gap between what the government aspires to do and what people understand about government initiatives.

Hence, although not fully supported by the political wing of the district government, the program office and its experts push themselves to provide the program services stipulated in both the establishment proclamation of the program and the regular instruction that it receives from the regional government. The program uses its own hegemonic strategies to influence farmers and promote its activities. This is seen in many of its operations whereby the program experts use either “soft” or “hard” techniques to impose the program objects on farmers.

The “soft” techniques include packaging the program activities into the dominant developmental ideology preached by the state. In so doing, the messages of the experts are packaged to either motivate farmers to align themselves to the developmental ideology or to create a sense of guilt for failing to do so. In the latter case, refusing to subscribe with the program directions is considered anti-developmental, backward or lazy. One of the experts for example complained, “What we lack is visionary farmers [...] many are just happy with their small daily gain. They have no vision for the future” (KGVDP-KII-6). Another expert stated, “Our bigger struggle is convincing farmers to produce three times a year. They feel like the government is doing it just for reporting purposes.” (KGVDP-KII-2).



Source: Own sketch

Figure 21: The political environment of KGVDP

The “hard” techniques involve all sorts of command and control systems created to direct the actions of farmers. When the soft techniques do not work, the experts turn to coercive measures. They first threaten the cooperative leaders, to push members to comply with their demands. If that does not work and if they feel that the whole of the cooperative is against their recommendation, they cut off the electric supply of the water pump. One of the experts interviewed stated;

“So, when people resist too much and go their way, we tell them to go on and do what they want. Then when they need water, we do not give it to them and their crop fails. Therefore, we have the water in our hands to control farmers’ behaviour. We try our best to work smoothly, but it does not always work well” (KGVDP-FGD).

This leverage often causes farmers to submit to the demand of the experts. However, this submission comes at a cost. It affects the healthy relationship of the experts and farmers, brewing subtle resistance by farmers.

What was more interesting is that at times, even the experts might not believe in the technologies that they were introducing to farmers. However, since they are told by their office promote them, they use their coercive power to impose these technologies on farmers. Two examples are the use of fertilizer and row planting for teff. In both cases, farmers resist these technologies arguing that they have not seen their benefits even after experimenting with them. Accordingly, one of the experts interviewed argued that the program office should make sure that any technology that it is introducing is in-tune with the needs of the farmers. Rather, the existing practice is to force experts to disseminate technologies recommended by the regional government to farmers that they themselves are not convinced of (KGVDP-KII-1). The following quotation from a focus group discussion with KGVDP experts demonstrates this point;

“On fertilizer, farmers would tell you that they don’t see the difference between using and not using fertilizer. Once an expert also raised the point in a meeting here at the program office and said that he could not see difference between those who use fertilizer and those who do not. On teff, for example we do not find a proper difference between those who plant in row and those who use broadcasting” (KGVDP-FGD).

In summary, the everyday activities of the KGVDP are linked with the overall political environment that it operates in. Directly or indirectly, the national developmental ideology and the regional government developmental targets dictate what goes inside the KGVDP annual plans. However, the political linkage between the regional/district governments and the KGVDP is weak. As a result, despite promoting regional, district government targets, and recommended technologies, the program lacks a political process that can build a shared attitude between the hegemonic ‘developmental state’ ideology of the state and the needs and aspirations of the irrigation users.

6.4.2 Action coordination through governmentality

The hegemony of the state developmental ideology requires governmentality mechanisms in order to contain and influence the action coordination of the irrigation beneficiaries towards the interest of the state. In this regard, three of the most important governmentality mechanisms in play in the KGDP was: the formation of the KGVDP as an autonomous yet state dependent body, the organization of farmers into cooperatives and other small groups, and the control of irrigation technologies. This section presents these issues together with the challenges of operationalizing these governmentality mechanisms in practice.

Formation of KGDP as a form of governmentality

One of the biggest challenges of state sponsored irrigation interventions is the limited capacity of government organizations to manage the complexity of a modern irrigation systems (Mollinga, Ruth S. Meinzen-Dick, and Merrey 2007). Oftentimes state agricultural offices have poorly skilled workers, are poorly funded, and are overstretched by having to serve large number of farmers. To curb this problem, the regional government decided to use a mix of state and community irrigation management models to manage the Kobo-Girana irrigation schemes. It established an autonomous organization to handle only irrigation management, namely the KGVDP office. The regional government governs the activities of the KGVDP through the regional level board. As described in section 6.4.1, the board meets once every three months and deliberates on the plans and reports of the program office. Such higher-level political attention enabled the program office to keep alert of the policy directions emanating from the regional government and allow the regional government to prescribe its development agendas to the program office with ease.

The KGVDP, especially since its reestablishment in 2011 has been given an exclusive mandate to manage irrigation schemes in the Kobo-Girana Valley. The organization is unique in the sense that unlike the conventional district agricultural office, the front line extension workers are highly educated, (a minimum of a bachelor's degree in agriculture) better paid than their district level counter parts, and have access to transport options such as motor bikes and other vehicles. It has a good mix of agronomists, maintenance technicians and marketing experts. The agronomists, who are also part of the front line extension work, manage three to four irrigation schemes at a time, serving an average of 300-400 farmers. These arrangements allow the program office to provide reasonably good advisory service for its beneficiaries. As

a program directly funded by the regional government, its agronomists work towards realization of the regional government directives and recommendations even when they are not themselves convinced of them (KGVDP-FGD). The regional government governs the program activities through the board established at regional level. The board meets once every three months and uses the program office plans and reports to control the program activities.

At the operational level, the program office has to coordinate its action with other sector offices to ensure the smooth functioning of its irrigation schemes. For example, if the program offices wish to receive high quality irrigation schemes, this must be done with the AWWCE. The irrigation schemes also require electric power to pump water from underground, which is provided by the EEPCO . The irrigation users have to be organized into user cooperatives, as that is the only legal form of farmer organization in the region, which must be done by the District Cooperative Promotion Office. The program office is also expected to align its activities with the other agricultural transformation interventions of the state, all of which are handled by the district office of agriculture. In principle, the action of these sector offices is supposed to be coordinated by the district level steering committee, with the chairman of the committee being the district administrator. However, as discussed in the previous section, the steering committee consistently fails to deliver on its responsibilities (KGVDPD-5, KGVDPD-4, KGVDP-KII-4).

The problem with the steering committee seems to be its composition. The logic behind assigning the Administrator of the Kobo District Government as chairman of the committee is due to the nature of the program activities which are under his political jurisdiction. However, other actors in the committee are outside of his political control. For example, the EPCO is a federal level organization, which the district administrator has no control over. The AWWCE is also a highly technical regional level organization for which the district government has neither the technical sophistication nor the administrative mandate to control its activities. On top of this, the district government also seems to resent the fact that the KGVDP itself is an independent organization accountable to the regional government with better material privileges (AWWCE-KII). As a result, the steering committee's capacity and willingness to coordinate actions necessary for smooth running of the irrigation schemes has been curtailed. This system level problem trickles down to the day-to-day operations of the irrigation schemes, as we will see in the coming sections.

Organizing farmers as a form of governmentality

The KGVDP has been given the mandate of managing the irrigation facilities constructed by the AWWCE. The program office governs the irrigation schemes using the water user cooperatives organized around each irrigation scheme. The legal mandate of organizing and promoting the cooperatives is with the Cooperative Promotion Agency (ANRS 2006). While the district Cooperative Promotion Agencies organize primary cooperatives, Zonal Cooperative Promotion Agencies are responsible for organization of cooperative unions (Emana 2009). Accordingly, there were 33 registered primary cooperatives working on the KGVDP irrigation facilities. There is also one cooperative union with 21 primary cooperatives, with a total 4105 members (KGVDP).

The primary cooperatives are the core mechanisms of organizing and controlling irrigation users for the KGVDP. The cooperatives are responsible for irrigation water distribution as well as the operation and maintenance of the irrigation schemes. The KGVDP agricultural extension service is also cooperative-based in that the services are primarily targeted to each primary cooperative.

In principle, the cooperatives are supposed to serve the best interests of their members. In practice, however, they only serve as control mechanisms for the government. Hence, by controlling the cooperative operations and the services that the program provides for irrigation users, the KGVDP can influence decisions made at the cooperatives level. This is not particular to the cooperatives under the KGVDP irrigation system but has held true for most cooperatives in Ethiopia's history (Emana 2009). The cooperatives function under the broader developmental ideology of the state, whereby the state dictates what counts as development and what does not. This ideology coupled with the power of funding the irrigation schemes gives the government the power to influence the operation of the cooperatives. As a result, the government tends to use the cooperatives as a mechanism to channelling its policy influence to members. Interviews with members of the cooperatives reveal that in many instances, the cooperative leaders are either inclined or forced to side with the government when conflicts arise between the government experts and farmers. This creates resentment among members, which leads to the questioning the legitimacy of the leaders and the notion that the cooperatives are self-help organizations, which in turn leads to resistance by members of cooperatives (V4-IIR-6, V3-IIR-2).

The program office governs the coordination of its irrigation management activities by controlling the leaders of cooperatives, their by-laws and ordinary members. However, a number of factors curtails the governmentality function of the cooperatives. As a result, even the KGVDP itself resents the organization of its users under a cooperative model. Interviews with both KGVDP experts reveal that the current system of farmers' organization under formal cooperatives, with the responsibility of promoting the cooperatives' capacity left to cooperative agencies is not appropriate for agricultural cooperatives (KGVDP-KII-6, KGVDP-KII-5, KGVDP-KII-1). As a result, cooperatives are formed hastily, with limited or no input from farmers; capacity building for financial management and leadership skills for leaders of cooperatives is not provided properly and regular auditing of each cooperative is impossible to do.

As a result, the cooperatives remain poorly organized and susceptible to resource embezzlement by the executive committee members. In most of the interviews and focus group discussions, irrigation users also complain about neglect and the poor functioning of the local cooperative promotion offices. One interviewee stated;

“The cooperative promotion office [...] they don't follow up the cooperatives, they don't check on the cooperative's executive committee. When the executive committee abuses the cooperatives' funds, the district office arrives only after a lot of damage has been done. They do not follow up things. Last time, when the committee was audited, one of the committee members was found to be embezzling 13000 birr, he paid 5000 birr but the rest was ignored. So, our strength is dependent on the follow up of the cooperative office, but because they are poor in their performance we also failed to grow” (V3-IIR-6).

Irrigation users' attitude towards the cooperative model of irrigation management was also negative. Unlike the popular perception of rural communities as homogenous, interviews with cooperative members showed that their life is filled with competition and envy. Members also have different backgrounds, with different land size, financial status, and risk absorption capacity. Nevertheless, farmers face a de facto pressure to join cooperatives despite the clear statement in the cooperative promotion proclamation that cooperatives are organized only on the basis of farmers own interest (ANRS 2006). The following two quotations demonstrate users' attitude towards cooperation;

“We are the first to organize into cooperatives and because of that we lacked knowledge. We failed to work together for growing. We had serious jealousy with each other, something which we have in our culture and which does not leave us that easy. We would have things going good and one member would come and destroy everything. Those who are lazy would drag those who are moving forward” (V3-FGD-3).

“People do not have the willingness to work together. They are actually jealous of each other. If you get a good harvest, people would be jealous of you. People steal each other’s irrigation accessories. You don’t see the attitude of ‘let us work together and grow together.’ It has not developed yet” (KGVDP-KII-1).

These negative attitudes towards cooperative work in general were fuelled by an overall suspicion of cooperative farming in general. This is due to negative experiences from the socialist Derg regime influence current perceptions. The bitter experiences of the cooperative farming from that era and the failure of cooperatives nationally make irrigation users wary of trusting their cooperatives (Emana 2009). This is also evident in the level of maturity of the cooperatives and the services that they provide for their members. Even cooperatives which have operated for the last 11 years, do not have any more collective funds other than what is necessary to pay their electric bills and minor maintenance. This is in violation of the statement in their by-laws which state that the cooperatives should commit 30% of their earning to build their cooperative asset base. Almost all of the cooperatives which have been using drip irrigation for the last 10 years failed to replace their irrigation laterals despite serious complaints that they were worn out. None of the cooperatives have any money for such major maintenance work (KGVDPD-4, KGVDP-KII-2).

One way the KGVDP governs the coordination of action in irrigation management is through control of the by-laws of cooperatives. The regional cooperative proclamation demands that each cooperative develop its bylaws in accordance with its purpose (ANRS 2006). However, in practice, the cooperatives receive their by-laws from the cooperative promotion agencies with little room for contextualizing them. One of the experts of the KGVDP that was interviewed stated “One weakness that I observed of our cooperatives is in their by-laws. They are copy and pasted from the regional template.” This prompts members to find a way to work around the by-laws, creating a parallel norm co-existing with the by-laws. For

example, regular meeting schedules for members and leaders were not observed in any of the six cooperatives studied despite such a requirement in the by-laws. Penalties for violating the by-laws were also not strictly observed. Such leniency of the cooperative members and leaders in observing their by-laws had a detrimental impact on the effectiveness of their cooperatives. One of the interviewees stated;

“The by-laws are the members’ decision; it is not supposed to be ignored. It is even recognized by the government. We have penalties stated in our by-laws for absenteeism in meetings, it is 20 birr, for free grazing livestock it is 50 birr per head, and for piercing the lateral while ploughing it is 100 birr. This was decided, but the executive committees do not implement it. As a result, people do not care much about the by-laws anymore” (V3-IIR-3).

Cooperation for water management is not a new phenomenon in the study areas. Farmers are used to organizing themselves for spate irrigation. The traditional association called a *kire* organizes the flood diversion for both crop production and watering livestock. The *kire* has clearly defined work schedules and penalties for those who violate the schedules. The penalties could be as simple as payment of fine or as severe such as alienation from village social life. When asked about why those principles were not used in managing the irrigation cooperatives, two reasons were mentioned by the respondents. First, the by-laws of the cooperatives were introduced in a top-down fashion. It created a sense that it is the KGVDP office that should be concerned about enforcing the by-laws rather than the farmers themselves (KGVDP-KII-5, V3-IIR-7). Second, the traditional water management mechanisms were a village wide institution, involving the majority of the villagers. For the irrigation institutions, however, there were only a few people who have a direct stake in the irrigation, as there were only a handful of villagers whose land falls within the irrigation coverage area. Hence, it was difficult to mobilize the traditional institutions for the same cause (V4-IIR-4, V4-Ob-4).

The other way that the KGVDP coordinate actions in its irrigation management was through the control of the cooperative leaders. An interview with KGVDP members revealed that the strong cooperatives were the ones that had strong leaders. The leaders play a crucial role in creating a shared vision among members, fostering a productive link with external actors, managing their internal affairs, and setting a good example of hard work for other members

to follow (V4-FGD-2). Interviews with experts also confirmed the same. The following is a quotation from one of the expert interviews.

“The leaders differ from project to project. Those cooperatives with strong leaders, they are usually strong. Those cooperatives with weak leaders are often weak both financially and in their performance. The strength of the cooperatives depends on the strength of the leaders. In general, if the cooperatives get strong leaders, you can see that things change for the better” (KGVDP-KII-1).

A number of factors working against them, however, curtailed the roles of cooperative leaders. The first as already discussed above was that the way the government pressures them to accept recommendations that their members will not agree to, which puts their legitimacy in the eyes of their members into jeopardy. Second, the management of the cooperatives requires basic literacy as well as business and managerial skills, which most of the leaders lack (V4-Ob-5). Of all the leaders interviewed for the study, over 80% of them had only basic education, only few had primary education and even less of them had secondary education. Third, for some of the cooperatives, the leaders lack the trust of their members as their members accused them of embezzling cooperative funds (V4-IIR-2, V3-IIR-7).

The program’s attempt to coordinate irrigation management through control of farmers’ organisations was also curtailed by issues such as land size of their cooperative members and ill structured property rights agreements for land such as sharecropping arrangements. Both large and small land sizes were found to be problematic. Those farmers with large farm size, over 0.5 ha, usually find it difficult to manage their irrigated field. One of the program experts argued that the ideal manageable land size with the current production technology is 0.25 ha (KGVDP-KII-2). Many, however, have land size exceeding one hectare; some even up to two hectare. Especially in study village four where farmers also had access to irrigation from a surface irrigation scheme complained that because all their farmers are under irrigation, they are living under constant pressure to produce two or three times a year (V3-FGD-1, V3-FGD-2). As a result, many decide to give away their land for sharecropping. Some, however, have only very small fraction of their land, as low as 0.1 ha, under irrigation. Hence all the three groups, those who have large land size under irrigation, sharecroppers and those with very small land size were frequently mentioned as difficult to manage in the

irrigation cooperatives as their interests do not coincide with the majority of the members (V3-FGD-1, V3-FGD-2, and V4-IRR-10).

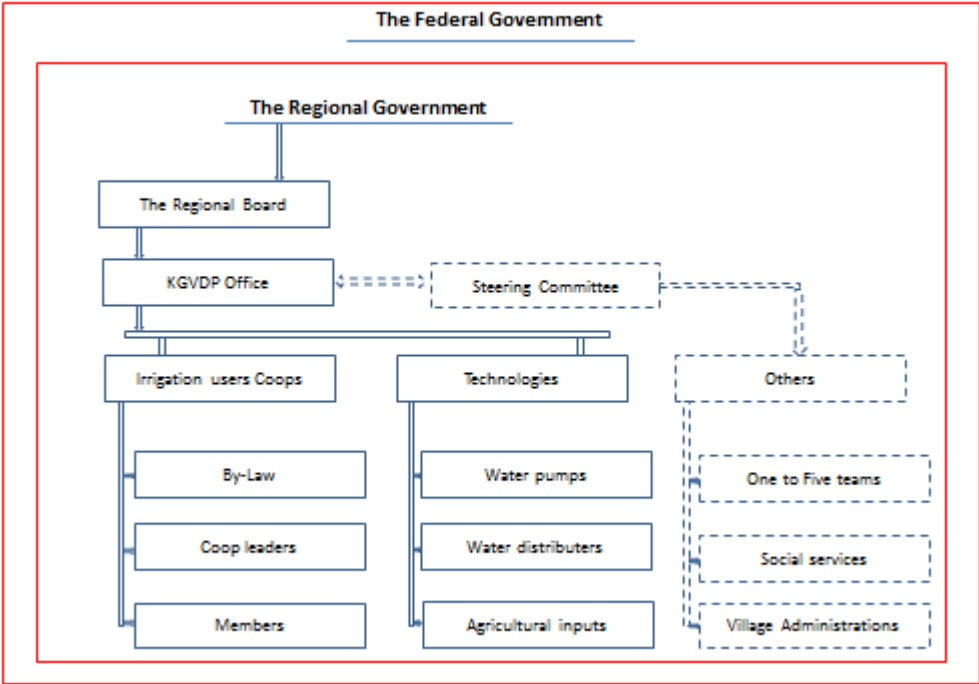
Irrigation technology as a governmentality mechanism

The irrigation technology also serves as a control mechanism by the KGVDP to coordinate irrigation management action, though in some cases it also acts as an obstacle. The irrigation withdrawal depends on pumping of water from underground. The technicians at the KGVDP have exclusive access and authority over the switches of the pumps. When the program office demands something and the cooperatives fail to meet the demands, the experts always threaten to cut off the water supply. The researcher observed this in action during fieldwork. On one of the field research days in study village three, the agronomist of one of the case projects called his boss from the program office to negotiate with committee members of the irrigation cooperative. The problem was that the program office demanded that the cooperative to buy their quota of the fertilizer stored at the program office at a higher price than the local market. The program office argued that the higher price was due to differences in the purchasing process by the program office. The committee on the other hand argued that they should not be forced to buy fertilizer at a higher price than the local market. They also argued that they do not need the amount of fertilizer that the program office was demanding them to take as some members had fertilizer left over from previous years. When the director failed to convenience the committee, he ordered his expert to switch off the electric water power pump. The farmers complained bitterly, but in the end, bought the fertilizer (V3-Ob-2). Such coercive control over the pump has been maintained by the program office as an important mechanism to contain cooperatives that do not abide by its work plans.

The water distribution technology also determines the level of control that the cooperative leadership and experts of the KGVDP have on individual farmers. Individual farmers who do not observe the demands of the cooperative leaders or the experts and happen to use furrow irrigation techniques could be easily identified and punished by cutting their water supply. This is not possible in the sprinkler and drip technologies. This is because for the furrow technology, the irrigation water is often released on individual-by-individual basis, whereas for the drip and sprinkler users, the technology demands that all the participating farmers receive water at the same time. This makes it hard to identify and punish drip and sprinkler free riders easily. The only punishment mechanism available was to take the offenders to a

local social court. Not only does this reduce the ability of the leaders to make quick decision, but also take a lot of their time as the village court process often requires lengthy procedures. The experts would be forced to cut off the water supply for all the users even when they only want to punish very few members of the cooperative. One of the leaders of the cooperatives with the drip technology expressed his frustration as follows;

“Even our village administration is not supporting us. When the committee sues someone, that person goes to court, but won’t be penalized quickly. He would then come back and scorn the committee saying that they sued him but nothing happened to him. We can’t penalize people with the water because the system opens 100 and 200 meters at once. All farmers under that lateral get water irrespective of their observance of the by-laws. If you close one, the whole lateral would suffer. Like in my lateral, we are four people. Three of us are strong, but one is so lazy. We even requested for the government to take away his land, but it didn’t happen and we have no way to force that guy to cooperate with us. The guy does not have a mind to think and the law does not hold him responsible” (V3-IIR-7).



Source: Own draft

Figure 22: The structure of the governmentality mechanism

In summary, the irrigation user cooperatives have been the main mechanism that the KGVDP uses to manage irrigation facilities and irrigation users. The control over water distribution both at the pump and plot levels enabled the program office to govern the irrigation facilities

and irrigation users. However, the effectiveness of these governmentality mechanisms is limited by problems with the irrigation user cooperatives and the nature of the water distribution technologies. The use of cooperatives was limited by the negative attitude of members toward the cooperatives' model, the top-down method of by-law formulation, poor by-law implementation by cooperative executive committees, limited capacity and trust issues of cooperative executive committees as well as other practical challenges such as sharecropping and landholding size. The use of the water distribution technologies was limited in some of the technologies such as drip and sprinkler systems as they do not allow direct control of individuals who violate cooperative by-laws.

Apart from these operational level challenges, some of the challenges of the governmentality are structural in nature. For example, despite the rhetoric in the program documents referring to building a "developmental army" among irrigation users, progress so far was very limited. Important political and bureaucratic farmers organizations such as development teams and one-to-five teams which are increasingly becoming an important forms of farmers organization were completely absent in the KGVDP. This has to do with the limited political influence that the district government has on the activities of the KGVDP. As a result, the hegemonic 'developmental state' ideology as well as its associated developmental targets and practices in the agricultural sector did not find the appropriate discursive and organizational structure to reach irrigation users.

Agricultural advisory service as a form of governmentality

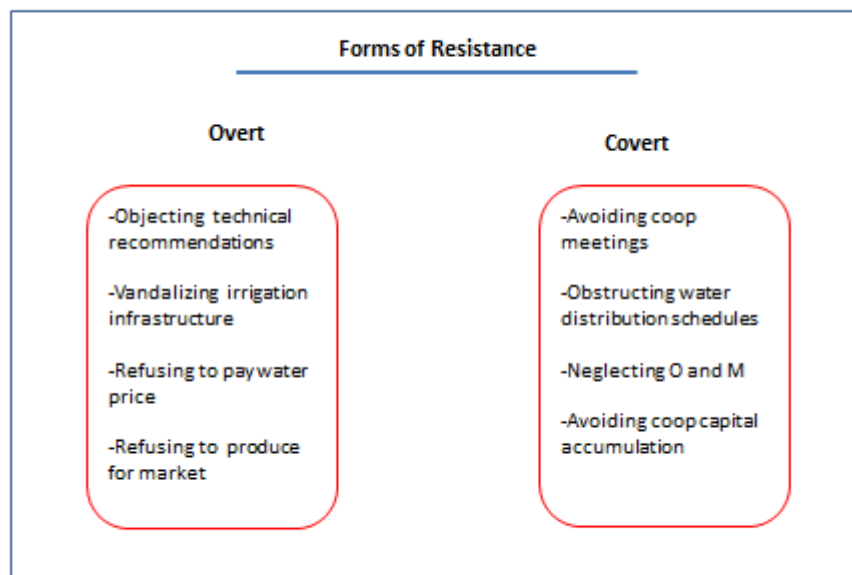
The advisory service under the KGVDP has some unique features that allows the program office to use it as one of the governmentality strategies. The program office calls its advisory service experts, agronomists. The agronomists have a minimum of bachelor's degree and several years of practical experience. They are also paid a premium salary compared to their district agricultural office counterparts. The program office also enjoys generous budget support from the regional government, meaning they can afford better mobility for their agronomists in the field. Every agronomist had a motor bike with enough fuel provision to make regular field trips. Additionally, the agronomists only serve small numbers of target beneficiaries, compared to their counter parts in the district. Each agronomists had two or three projects, with 200-450 beneficiaries, which is far less than the national average of extension workers to beneficiaries ratio of 1: 635 (Davis and Korma 2013). The agronomists

also had a clear list of beneficiaries with their exact land size, making it easier to calculate the amount of inputs such as fertilizer and improved seeds needed for their project. Although these things all sound positive, they also had their downsides when misused by the agronomists as a form of containment strategy.

6.4.3 Counter containment strategies of irrigation users

The containment strategies of the state to coordinate irrigation management, be it the hegemonic or governmentality projects, often meet overt and covert resistance by local communities. While some of the resistance was directed at the state action itself, some resistance was a result of a clash between the state action and local cultures. The overt resistance by local communities started during the initial phases of the KGVDP when the government started developing the ground water source into an irrigation scheme. These initial stages of irrigation development faced serious setbacks due to stiff resistance from the local communities who suspected that the government action was a way of grabbing their farm land. The farmers actively sabotaged the construction activity in many instances and destroyed the irrigation infrastructure (V4-IIR-1, V4-IIR-4, KGVDP-KII-4).

Even after farmers were convinced that the irrigation schemes were built for them, their resistance continued for some time because of a widespread fear that the schemes would force them to abandon their traditional sorghum crop which takes a longer period to mature. This led to numerous instances of destruction of the irrigation accessories by villagers, which frustrated the project staff and the local government at large (V4-IIR-4, KGVDP-KII-4). This brings our attention to the importance of the creation of shared values between those seeking to establish a hegemony and their subjects (Sum 2012). Without the people at the bottom end of the decision making process sharing the values and aspirations of the government developmental initiatives, the focus on hydrologic and national economy logic only will not be successful.



Source: Own sketch

Figure 23: Overt and covert counter containment strategies of irrigation users

Once the irrigation schemes were fully functional, the program office continued with its containment strategies to make farmers produce for the market and use improved technologies/practices. When farmers did not see the benefits of the program recommendations but still had the program pushed on them by the program experts, they resorted to different forms of overt and covert strategies of resistance. In most instances, they would reject the recommendations of the experts openly and refuse to implement them on their farm. For example, many of the farmers objected to the recommendation to plant teff in row. Others objected to the use of inorganic fertilizer on their farm. When forced to use the fertilizer, farmers refused to apply it on their plot, opting rather to sell it on the black market (V4-IIR-2, V3-IIR-9).

One area where there has been continuous struggle with local communities has been convincing them to produce for the market. The establishment proclamation of the KGVDP states that the program would help to commercialize the small holder subsistence production system (CARS 2011). As a result, the program office introduced different crop choices for commercialization. However, only onions found a sustained market, attempts at cotton, beans, pepper, and tomato failed. One respondent from study village three explained the situation as follows;

“Well, initially it was fine, but with time things went wrong, people used to respect cooperative decisions, we used to deliberate quite well. In between, we get used to each other and get loose. We tried pepper and the benefit was good. We did not do it again, but it was fine. We also planted cotton, but the market was not good, we sold it in the end, but we didn’t go back to it again” (V3-IIR-9).

Farmers, on other hand, resist producing for the market for two reasons. First, producing for market often comes with risks. It requires ability and willingness to take risks of market failures. For most of the smallholder farmers, it is either impossible or too costly to take such risks. For some of the farmers, the risk of just a one-season loss could be detrimental to their entire livelihood. The experience of one young farmer whom the researcher met during the fieldwork exemplifies this. He had 0.24 ha of land in the irrigation area. He said, in the year before the fieldwork, he planted onion but the crop failed due to some technical faults, taking away his 4000 birr investment in it. This failure cost him dearly. He was left with nothing and it was difficult to support his family. As a result, his wife divorced him. He said that even if he tried to convince her that they might get better result next time, she was not convinced that he could actually support her and her child. He was scared of living with such uncertainty, not sure of whether he would make it through in life or not. He then said that under such conditions, it is hard for him to get enough money to cover his investment on production inputs. “If now I am asked for 500 birr for fertilizer, I literally have nothing,” he lamented (V4-Ob-6).

For farmers in the area, life had not been market oriented. Production was mainly for subsistence, savings were made in kind using the storage of grains, and the market was limited in scope and was meant only to cover a few other non-food expenses. Hence, some of the respondents said, even with the irrigation, they prefer to produce food items that they know how to save and exchange. As a result, even when they earn well in their commercial production, farmers found it hard to cope with the challenge of saving in banks and managing their spending (KGVDP-KII-1, V4-IIR-9).

The second source of resistance for commercial production was the mistrust that farmers developed toward the marketing processes. When marketing onions, the KGVDP often invites major traders in the surrounding area for a tender when the products are ready. The traders submit their price quotation to a committee comprised of farmer representatives, the program

office, the cooperative promotion office, and the district agricultural office. There were some complaints from the respondents both during focus group discussions and during individual interviews about traders who would form a coalition before the tender process to fix the price of the goods to their own advantage. The traders were also accused of manipulating the weighing machines to cheat farmers (V4-FGD-2, V4-IIR-9). The following quotation sheds light to the sort of complaints that some of the respondents had;

“There was a serious allegation regarding the marketing issue. Both the people of the district and the cooperative committee were implicated. When the traders come and sign contracts, the contracts are signed at the district office. Then the traders would come later and say that they could not deliver what is on the contract, because of market fluctuations. When we complain about this to the district, they would tell us to negotiate with the traders. The committee also sides with the traders. The traders would give a better price or favour themselves on the weighing. That way the committee agrees to shut the mouth of other members who are complaining. The committee, our own people, would tell us to just agree with the traders and fall for whatever the traders say” (V4-IIR-9).

To sum up, the different forms of counter containment strategies poses serious challenges to the realization of the irrigation’s potential to create subsistence farming that is climate-proof and stimulate agricultural transformation in the study areas. As we will see in the next section, there were significant productivity differences among irrigation users indicating the presence of a yield gap. One can also conceive of possibilities that involve introducing more robust technology and market innovations which can tap into the existing irrigation potential, that are not being realized because of failures to coordinate state and irrigation users’ actions properly. Hence, the biggest hurdle facing the irrigation intervention is overcoming the social and political limits of action coordination to enable actors at different levels to develop a shared understanding of the present situation and vision for the future.

6.5 Implications for adaptation with climate risks

The previous sections elaborated the containment strategies of the state to coordinate actions for the irrigation management project in Kobo-Girana valley. We have also seen the counter containment strategies of local irrigation users in resisting the state’s containment strategies. The existing irrigation management strategy is hence a result of the struggle between these

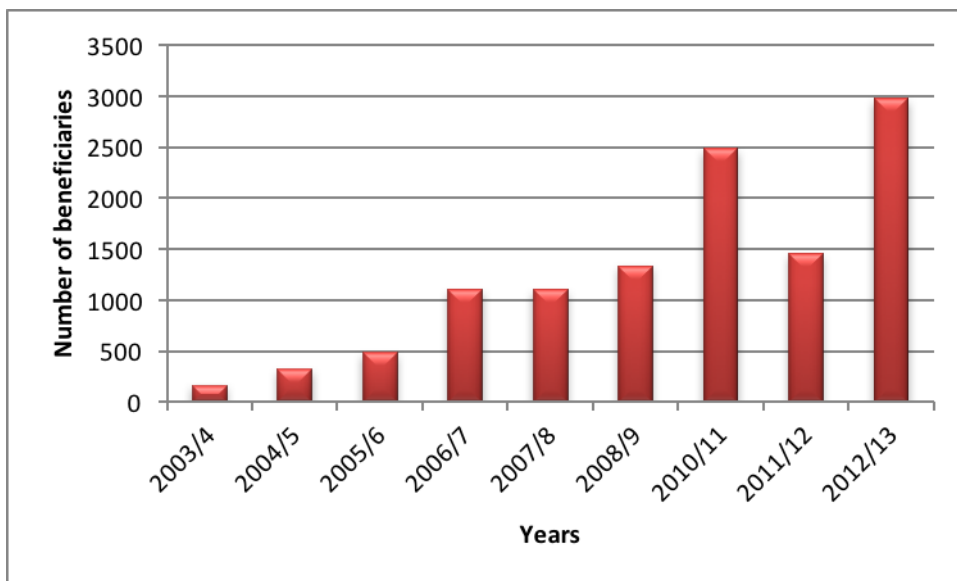
two forces. It is worth noting, however, that the struggle does not necessarily mean a zero sum game between the state and local communities. In fact, they both agree in principle on the relevance of the irrigation intervention to climate proof and transform the subsistence agricultural production in the valley. This section presents the achievements of the irrigation management intervention, highlighting its implications for adaptation to climate risks.

Available data for nine years of the program gathered from KGVDP annual reports from the period of 2003/4-2012/13 shows that commercial production, mainly onion but to a limited extent tomato, started with one project and expanded to 18 projects. The reports contain only those irrigation projects which were active in cash crop production. Hence, it is worth noting that the numerical information on the impact of the program is underreported here due to the omission of food production data. Accordingly, the cultivated area expanded from 39 ha in 2003/4 to 912 ha in 2013/14. During the same period, the number of beneficiaries also grew from 167 to close to 3000. The aggregate annual revenue from sell of cash crops also grew from a little less than 50,000 birr in 2003/4 to over 55 million birr in 2012/13.

Year	Budget	Number of Projects	Area cultivated	No of beneficiaries	total revenue
2003/4	5620001	1	39	167	46800
2004/5	4634250	2	74	320	252374
2005/6	4734316	4	160	485	593971
2006/7	9846502	8	355	1099	6110714
2007/8	8782070	8	356	1099	6150246
2008/9	390000	10	401	1332	10052402
2010/11	2763401	18	720	2486	15747298
2011/12	5300920	6	394	1453	13116657
2012/13	6019360	18	912	2974	56742520

(Source: Compiled from annual reports of KGVDP)

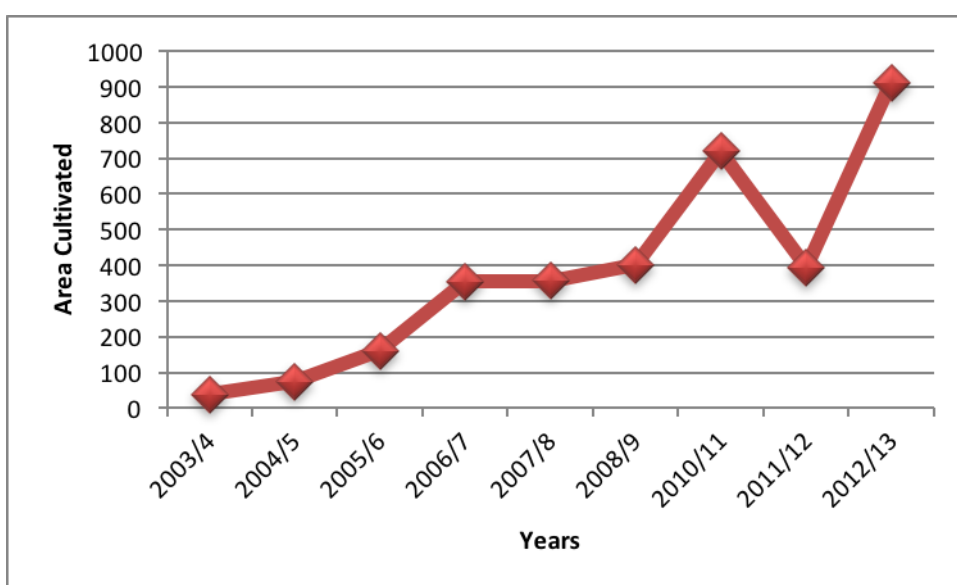
Table 5: Overall growth of the KGVDP for 9 years period



(Source: Compiled from annual reports of KGVDP)

Figure 24: Increase in the number of beneficiaries of KGVDP irrigation intervention

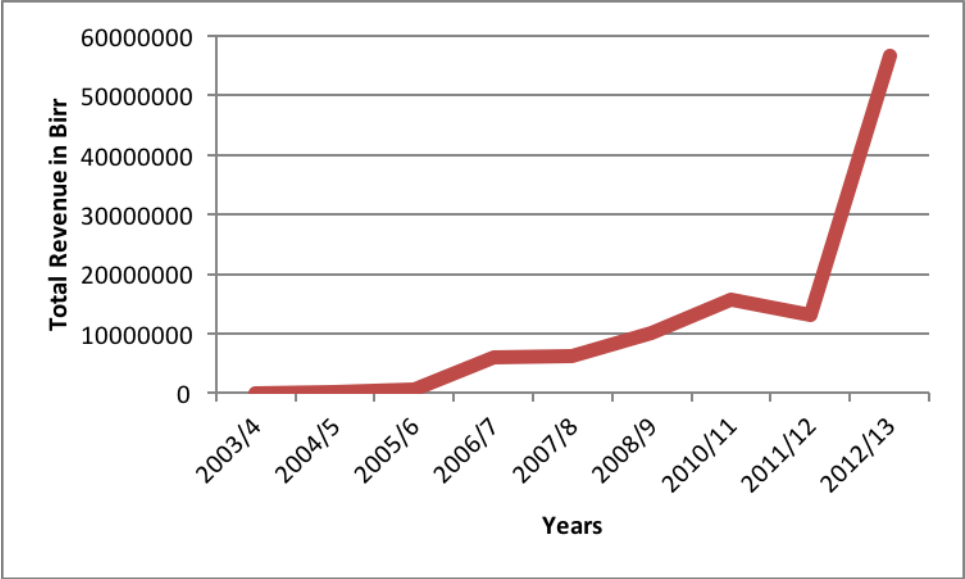
Note that the annual budget of the program has been fluctuating. This is a result of changes in the organizational mandates. During the early stages, the program focused on improving the rain fed farming system of the area. Later on however, the focus shifted towards irrigated agriculture, whereby the program was responsible both for the construction and for management of irrigation schemes. After 2010/11, the responsibility of irrigation construction shifted to the AWWCE and the program office was given the sole responsibility of irrigation management.



(Source: Compiled from annual reports of KGVDP)

Figure 25: Increase in area under cultivation under KGVDP irrigation intervention

It is also important to note that despite a clear statement in the establishment proclamation of the KGVDP regarding the cost recovery arrangement of the irrigation development in the area, in practice farmers were not required to pay back anything. Additionally, unlike the other sectors, small holder farmers are not subjected to income tax. Hence, the huge revenue generated from the sale of cash crops goes directly to the irrigation users. This helped the beneficiaries to build household assets within a few years of cash crop cultivation.



(Source: Compiled from annual reports of KGVDP)

Figure 26: Trend in annual revenue generated from sell of cash crops under KGVDP irrigation schemes

This raises a question on whether this level of state subsidy would be possible in other areas as well and whether such interventions would be financially sustainable in a broader sense. However, this also shows that the very purpose of the program is to help subsistence farmers living in the area to break their dependence on highly variable rainfall pattern of the areas and transform their livelihood. The program design documents of the KGVDP and interviews with its experts also confirm these facts (KGVDPD-1, KGVDP-KII-6, AWWE-KII). One of the experts expressed this as follows;

“Well, famers in this area are lucky. Of the limited scarce resources, a lot is invested here and farmers are improving their life. Now they build assets and improve their life. Of course, these benefits have trickledown effects on the nation at large, but the main beneficiaries are the local community members. This was the main objective

from the start. None of the program beneficiaries have to worry about whether they will be able to feed their family or not” (KGVDP-KII-6).

As indicated in the chain of benefits of the irrigation management intervention (See Figure 27), the KGVDP provides both supplemental and full irrigation services. The supplemental irrigation is meant to tackle climate related risks such as rainfall failure during planting and seed setting stages, and moisture stress during the crop growth stage (AWWE-KII). As a result, the beneficiaries do not have to wait for the start of the rainfall or worry about moisture stress after the crops are grown. This also makes farming more predictable than purely rain fed production systems. Farmers can plan their activities and estimate the amount of produce they would get from their investment (V3-IIR-4). One of the respondents during a focus group discussion with KGVDP experts relates his experience as follows;

“Well this area is known for moisture stress, especially during the seed setting stage. Moisture stress is common. Because of that, most of the projects were supplemented by irrigation during the main production season. For example, I have two projects, project number 21 and 20. Last year both had moisture stress. Project 20 had irrigation, and project 21 did not because of a pump problem. The difference was significant both on the crop stand and on the harvest. Those in 21 had to give the crop stand to their livestock as it was damaged completely. Those in 20 harvested well. The difference was visible, not just on my projects, but in other projects as well. Without supplemental irrigation, the yield loss is a lot” (KGVDP-FGD).

The full irrigation services on the other hand is meant to add a second and/or a third production season to the traditional one production season per year common in the area. The irrigation intervention also introduced cash crop production using the cluster approach, which allowed beneficiaries to produce for bigger markets. These services improved food crop production and increased the income of farmers, which in turn improved the overall livelihood of beneficiaries of the program. One of the experts interviewed explained this as follows;

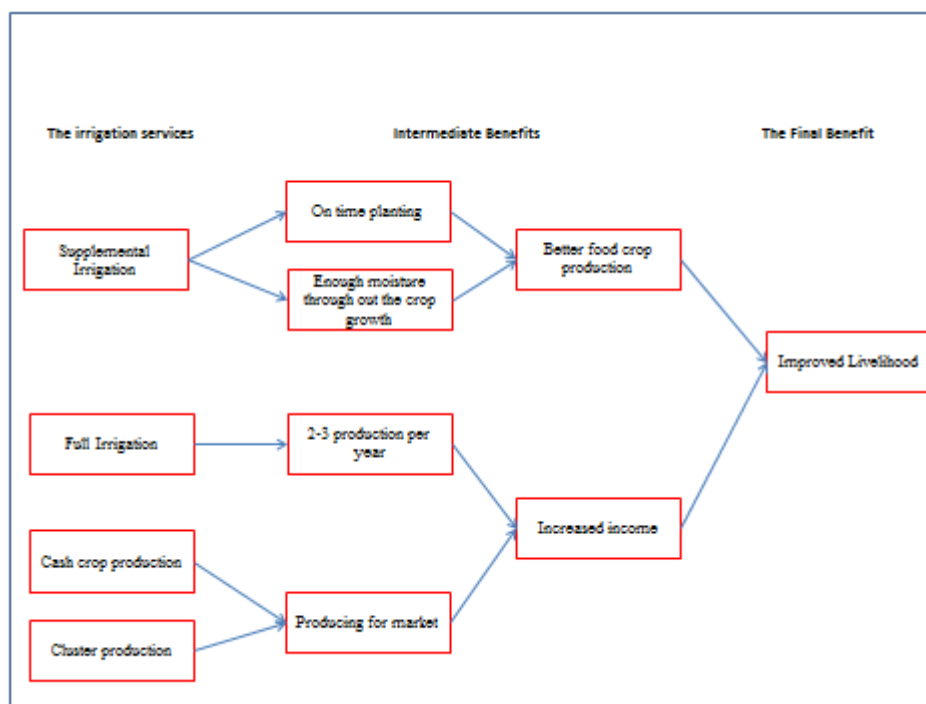
“There was a farmer who got 73,000 birr from close to one ha of land. From 0.25 ha, there were those who got 40000, 30000 or 20000 birr. It all depends on the farmers’ strength. Some even had no ox to plough their land. Now they have a pair of oxen and camels. When I start working in this village, there were only seven iron-roofed houses, now there are 50 iron-roofed houses. That is the data of last year, and I am

sure this year the number will increase. When farmers plant onion, they usually sell at a minimum price of 7.5 birr per kilo. For an onion, if you sell even for anything above three birr, you are profitable. When they get a price such as 10 birr, they get a lot of money.”

The beneficiary farmers also concur with the experts on the benefits. Many of them stated that the irrigated plots are their main source of cash. This allowed many of them to buy plough oxen, build houses, send their children to school and even send their grown up children to Arab countries for better opportunities. Even when their land is small and when some of them had to work on someone else farm as a sharecropper, the irrigation still provides a good source of income (V3-IIR-3, Vs-KII-4, V4-IIR-5, V4-IIR-9). The following quotations from individual respondents indicate the kind of benefits that they receive from the intervention.

“Like myself last year, with sharecropping, I was able to make 33000 birr; I gave 16500 for the owner and took the rest for myself. This is just in three months, I only payed 4000 for labour. Then I planted it with teff and we got six sacks, I gave him three sacks and I took three sacks. So, as you can see, even if land is small, with irrigation, land size is not the main problem” (V4-IIR-3).

“Well, the government made us this irrigation; it saved us from a lot of trouble. We now produce without waiting for the rain. In addition, when we can, we build assets with it. For me, I am able to support my family and myself. Once I was able to earn 23000 birr. With the money I sent my kid to Saudi and bought an ox” (V4-IIR-4).



Source: Own sketch based on data analysis

Figure 27: Chain of benefits of the irrigation management intervention

Despite the benefits described above, however, some outstanding issues limit the usefulness of the irrigation intervention. First, it is important to note that the benefits generated from the irrigation do not apply to all irrigation users. The most vulnerable, the poor and female-headed households could either be negatively affected by the intervention or not get equal benefits compared to others. For example, market oriented production subjects farmers to high production and marketing risks. Onion production, for example, requires an initial investment for production inputs such as, seeds, fertilizer, pesticides and labour. As in any other agricultural production, the outcome is uncertain. When the crop fails for some reason, it takes all the investments with it, which is a scenario that poorest farmers cannot afford. Second, although the price of onion could get as high as 10 birr, it could also sink as low as 1 birr per kilo, depending on the regional market trend. In such cases, farmers might not be able to break even.

Some groups of beneficiaries, such as female-headed households also could not get as much benefit as other beneficiaries. This is due the local culture that does not allow female farmers to plough their land. What happen often is that the female headed households either rent out or give their land out for sharecropping. In one particular incidence, the researcher met one women beneficiary from the oldest irrigation project in the area and asked her what the

benefit of the irrigation intervention had been for her and her family. She answered as follows;

“It is not much. First, our land is too small. Second, the land belongs to my sister and me; hence, whatever we get we have to divide it into two. Third, we have given it for sharecropping; hence, we only get a handful of grain or small money. It is too small. As a result, I never went to the meetings of the irrigation project” (V3-Ob-3).

Interviews with KGVDP members also show that while the climate risk management component of the project has been realized, the full potential of the development component has not yet been met. The experts argued that there are still yield and market gaps that could improve the beneficiaries’ livelihoods. Experts complained that the irrigation beneficiaries lack vision, that they are happy with their small gain. The benefits are also so far only at the individual level. The cooperatives hardly grew as an organization. Most barely accumulated joint capital or asset (KGVDP-KII-6, KGVDP-KII-1, KGVDP-FGD). As a result, the huge investment by the government is perceived to be limited in its impact. One of the interviewed engineer lamented;

“I consider an irrigation scheme to be successful only when the people accept it as theirs and use it properly. In any project, the design and the construction work are not too difficult. Convincing the people to make best use of it is what is most difficult. I have a feeling that all of what we do will not be sustainable. I feel that we are wasting our resources for nothing. Farmers are exempted from many expenses. A single deep well could cost about 3.5 million birr, the pump around 600,000 birr and there are a lot of other costs. Farmers are paying only for the electricity after the construction phase is over, and they start using it. In the long term, we expect them to cover even the initial investment. But from the way they use the system; I don’t think they take the infrastructure seriously” (AWWE-KII).

The irrigation intervention might also not be fully climate change proofed despite relying on ground water. As of the current situation, the project design reports indicate that there is enough ground water to irrigate around 17000ha of land. However, the source of the ground water is run off coming from the neighbouring highlands. As a result, according to an interview with an irrigation development engineer in the area, the future of the ground water is dependent on the impact of climate change in the neighbouring highlands (AWWE-KII). The irrigation technology, especially the drip system also has some defects, which makes it

unsuitable for local crops such as teff. The drip system is completely useless for the supplemental irrigation of teff production, for example, as the distance between the two drip irrigation laterals is too wide for teff production.

The intervention also created its own risks. As it was seen in chapter four, two of the risk settings identified in the irrigation management case study area were market volatility and government policy failures. Both of these risk settings are related to the intervention. For example, the program office promoted cash crop production and the use of improved agricultural inputs. Both of these recommendations helped many households transform their life for the better. However, for some, the exposure to the risk of market failure comes with a high cost.

The containment strategies of the state in general and the program in particular also create their own risks for farmers. As it was seen in the previous chapter, the government's development state ideology gave it a discursive advantage in deciding what counts as development and what does not. This creates a condition whereby the program office and other operational level offices automatically take any recommendation from the regional government in general as "development" irrespective of the contextual relevance of the recommendation for their specific area. This created strong resistance from local communities. However, some of the recommendations were pushed through using coercive measures.

It is also important to note the tricky combination of development and adaptation in practice. Most of the respondents were happy about the irrigation project's role in breaking their rainfall dependency. One of the respondents in study village four said, "it would have been better if the government focused on the provision of water and leave the production system for farmers." He further argued, "If that was the case we would have sown our own seed and used our own cultural practices which we know how to do well" (V4-IIR-6). While such climate proofing of agricultural practices was part of the initial objective of the intervention, the government added a mandatory development dimension to it, requiring farmers to produce for the market and use the government promoted agricultural technologies. Hence, the addition of a development component created its own risks.

6.6 Interim conclusion

The action coordination for irrigation management in this case study involves management of the cooperation of a multitude of state, community and market actors. This case study intervention had two components, climate proofing of agricultural production in the area and a development component of commercializing subsistence production. To this effect, the government used different containment strategies, by combining state developmental ideology and governmentality strategies. A number of counter containment strategies from irrigation users met this. Several points are worth mentioning as concluding remarks.

First, the struggle between the state containment and local communities' counter containment strategies were not always negative. While the state containment strategies helped to break cultural barriers to improved agricultural practices, local communities counter containment strategies helped the government to contextualize and refine its recommendations. In instances where the state was too adamant in using its containment strategies irrespective of local communities' response, it has to use coercive measures and this often leads to failures in well-meaning recommendations. On the other hand, certain counter containment strategies may develop which are not necessary against state containment strategies, but has to do with cultural reasons that are not amenable to the intervention logic.

Hence, the future of the KGVDP irrigation management intervention depends on how the state hegemony and governmentality containment strategies play out with people's counter containment strategies. On the one hand, the containment strategies need to be forward looking and innovative in addressing climate risks and agricultural transformation while ensuring that local peoples interests, aspirations and capacities are recognized. On the other hand, irrigation users need to make use of existing action coordination mechanisms that exist for best interest. Outstanding issues which need the state's as well as users' attention include: operation and maintenance of irrigation accessories, the use of yield improvement technologies, the mechanization of some of the agricultural activities, diversifying cash crops grown and penetrating bigger markets. What is needed most is a mechanism that brings actors from different scales together to build a common consensus about the nature of the problem in coordinating action in irrigation management and develop a shared vision for the future.

Chapter Seven

Social Learning for adaptation action coordination

7.1 Introduction

The previous chapters showed that both the watershed development and irrigation management interventions require action coordination between local communities and state actors at different scales. The case studies also revealed that the final results of these interventions are a function of the struggle between the containment strategies of the state and the counter containment strategies of local communities. The watershed development intervention for example, was most successful in places where the hegemonic ‘developmental state’ ideology penetrated everyday life of local communities through variegated forms of state governmentality strategies. The watershed development intervention enabled local communities to coordinate their actions in order to rehabilitate their degraded land, conserve their soil and water, and improve their livelihoods. In places where the state containment strategies faced counter containment resistance from the local communities, the watershed interventions failed to coordinate the actions of local communities even when the potential benefits were well acknowledged. For the irrigation management intervention as well, the climate proofing as well as development impacts of the project depends on the alignment of the state’s objectives with the interests, aspirations and capacities of the local people. The results also show that this intervention tends to be dominated by hydrological and economic considerations rather than social and political ones. Because of problems within the governmentality strategies of the state, as well as local resistance, the irrigation interventions studied failed to achieve its full potential.

These findings show that natural resource based adaptation actions are not merely technical solutions. Rather they also have strong political and social dimensions. Hence, understanding these dimensions is as crucial as understanding the technical and ecological dimensions of adaptation actions .

This chapter takes the conceptualization of adaptation even further by looking at it from a social learning perspective. The point of departure for the chapter is the assumption that social learning could help to transform action coordination by opening spaces for deliberation and learning. Learning could develop social capital and social/political efficacy of actors,

which would reduce the negative outcomes of conflicts between state containment strategies and local communities counter containment strategies (Hanson 2012).

This chapter aims at addressing the third research question which states, “How do power relations among actors influence the transformative potential of interactive platforms created for adaptation action coordination?” The central argument is that action coordination among local communities as well as between local communities and the state can be transformed by opening up a space for inclusive deliberation and learning among actors (Hanson 2012). This chapter is organized into five sections. Section 7.2 presents the definition and operationalization of social learning as a concept. Section 7.3 presents the social learning dimensions of the watershed development and irrigation interventions. Section 7.4 outlines the various forms of learning in the case study interventions. Section 7.5 presents the limits and potentials of the interventions for transformational adaptation. The final section provides the interim conclusion for the chapter.

7.2 Social learning as a theoretical concept to understand action coordination

Chapter five and six, on watershed development and irrigation management, revealed that resource management is a process which involves multiple actors, both within the state and the local communities. These chapters also revealed that resource management processes in Ethiopia are intrinsically political, with the state taking a lead role in coordinating the action necessary for resource management. While the state attempts to contain the collaborative process, local communities respond with various forms of counter containment strategies. This chapter zooms in on the social interactions among local communities and between local communities and the state, in order to understand the process of developing shared understanding around resource management problems and possible solutions.

The analytical concept used in this chapter is social learning. Social learning has been defined and operationalized in various ways, at times creating confusion about its exact meaning (Rodela 2012; Rodela 2011; Reed et al. 2010). Hence, Ison, Blackmore, and Iaquinto (2013) underscore the importance of delimiting the specific operationalization of social learning in a given study. This helps to avoid vague and at times contradictory use of the concept (Armitage et al. 2008). Accordingly, social learning in this study is defined as a process as well as an outcome whereby actors with multiple interests come together for an

interactive engagement in order to coordinate their actions towards the sustainable management of natural resources (Ison, Röling, and Watson 2007; Mostert et al. 2007).

The above definition of social learning combines five crucial elements. First, it indicates the need to bring multiple actors together. In this study, these are state and local community actors who are engaged in the implementation of watershed development and irrigation management interventions. This requires the creation of a space of interaction among these actors, often called a “public sphere” (Hanson 2012) or “stakeholder platforms” (Faysse 2006). The second element is the nature of these spaces. The spaces of interaction need to be inclusive and deliberative. Inclusiveness in these spaces ensures their legitimacy among actors (Hanson 2012). Deliberation ensures that people get the chance to express their views and interests in a non-threatening way (Hanson 2012; Burkhalter, Gastil, and Kelshaw 2002). The third element is the decision making process in the spaces. The actors interacting in the public spheres or platforms need to feel that their views are accounted for in the decisions that are reached (Hanson 2012; Burkhalter, Gastil, and Kelshaw 2002).

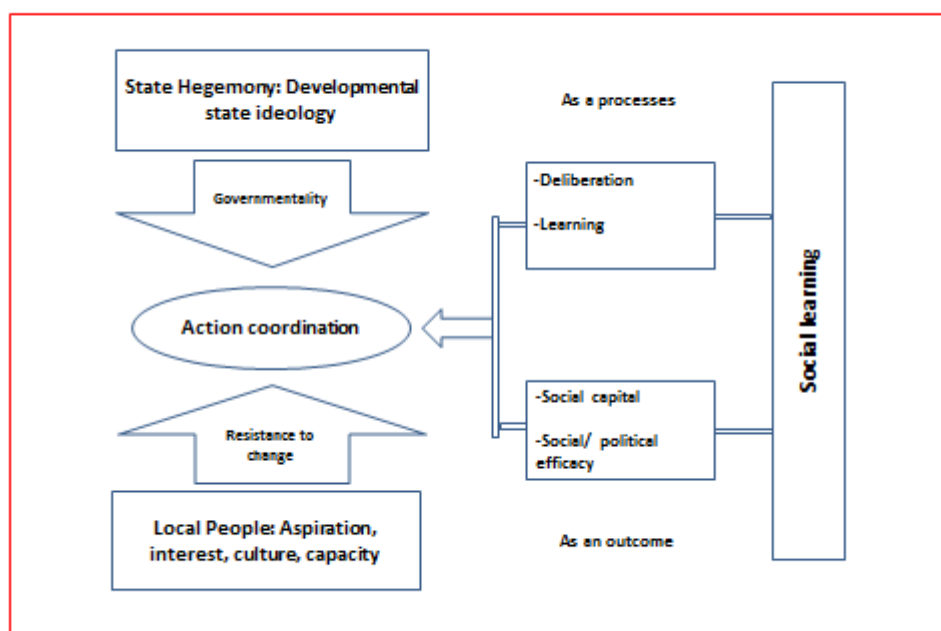
The fourth element is the issue of learning. Social learning processes allow those engaged in the process to learn from their social interactions and mutual reflections with others in joint ventures. Such learning is termed in a variety of ways, including “transformative learning” (Mezirow 1997), “adaptive learning” (Armitage et al. 2008), “experiential learning” (Maarleveld and Dabgbégnon 1999), “anticipatory learning” (Tschakert and Dietrich 2010), “loop learning” (Tàbara and Pahl-Wostl 2007), “collaborative learning” (Daniels and Walker 1996) or “situated learning” (Lave and Wenger 1991) depending on the focus and the source of learning. What is common in these manifestations of learning is the involvement of social groups in the learning process and the use of some form of mutual reflection as the main source of learning. The fifth element of the definition is the final outcomes of the above processes, social capital and socio-political efficacy. Deliberation and learning in public spheres and/or platforms can enhance the social network and bond of actors involved (Adger 2003; Pahl-Wostl 2009). Such social capital can enable actors to have stronger social and political efficacy when implementing the decisions and learning outcomes of their mutual engagement (Hanson 2012; Pahl-Wostl 2009).

In a given action coordination for resource management, there are three broad patterns of participation that are possible. They are referred to here as: “no social learning”, “first order

social learning” and “second order social learning”. In a no social learning situation, decision-making would take an exclusive command and control approach. In such a situation, no attempt is made to bring actors together, or if they are brought together, decisions are exclusively based on the unilateral interest of powerful actors. Experience has shown that when the state uses such an approach in a top-down fashion, it faces serious resistance from locals and often such interventions fail to yield the intended results (Li 2005; Scott 1998).

First order social learning is what Hanson (2012:1184) called “participation as social guidance”. In social learning and organizational studies, this is also referred to as “single loop learning” (Armitage et al. 2008; Argyris and Schön 1974). This is when social learning processes are used for the instrumental purpose of ensuring cooperation of local communities in an intervention with an externally fixed set of objectives. The wills, interests, aspirations and capacities of local communities are given secondary priority. Interventions seek the participation of local communities because local communities have the necessary knowledge or resources needed for the intervention or because local communities wield power to derail the implementation process of an intervention (Hanson 2012). This scenario addresses the conflict between state containment and local communities’ counter containment strategies to a limited extent.

Second order social learning is what Hanson (2012:1184) called “participation as a transformation”. In social learning and organizational studies, this is also called “double loop learning” (Armitage et al. 2008; Argyris and Schön 1974). This is a situation whereby local communities’ interests, aspirations and capacities dictate significant portions of the intervention. In this scenario, people feel that they are active agents in the decisions that affect them and take the opportunity and responsibility of fulfilling their interests (Burkhalter, Gastil, and Kelshaw 2002). This scenario can significantly reduce conflicts between the state and local communities by enabling reasonable and acceptable target setting by the state and acceptance, or at least toleration of the policy directions on the part of local communities.



(Source: Own sketch)

Figure 28: The role of social learning in action coordination in resource management

This chapter uses this operationalization to analyse the social learning situation in the case studies of the watershed development and irrigation management interventions. The analysis proceeds first by identifying the public spheres/platforms created for deliberation in both case studies. It then proceeds to analyse the deliberation process in terms of its inclusiveness and openness. It continues with identifying different forms of learning evident in the case studies. The final part of the analysis looks at the outcome of the social learning process by looking at the social capital and socio-political efficacy brought about by the case study interventions.

7.3 Deliberation in the case study interventions

7.3.1 Spaces of interaction in the watershed development intervention

Action coordination in the watershed development intervention requires the interaction of multiple actors at different scales. At higher levels, such as the federal or regional levels, state and donor actors interact in defining policy directions and funding mechanisms. The focus of this chapter, however, is not at this level. This chapter focuses on the interactions that occur at the village level between different community and state actors working in the case studies.

Action coordination in the watershed development intervention requires the interaction of government experts with community leaders and the public. The leadership in the watershed development intervention includes the village cabinet, the village council members, development and one-to-five team leaders and the village militia. The public includes other community members in the village, some are party members and others are not. The experts include village development agents as well as district and sometimes even zonal and regional experts who come to the village for technical and political support/supervision. This section presents these spaces of interaction together with a brief analysis of the inclusion, deliberation and decision mechanisms.

Village council meeting

Village councils are a core part of village governments. As in higher level councils, village councils bring together electorates from different election sites in a village. In study village one for example, the village administration set seven election sites in the village. As the only active party, the EPRDF nominated its candidates. Then from each of the seven sites, council members were elected. The number of members that represent each site depends on the number of people living in that site. Accordingly, the council had 202 male and 198 female members. The missions of the council include evaluating the work of the village cabinet, evaluating the implementation of village plans and village law making. The council had seven sub-village and 15 standing committees. The council meets once a month and in these meetings, reports are presented and missions on important issues are given to the relevant bodies in the village. Votes are considered as the main decision making mechanism with decisions being passed after a majority vote. On average, council meeting attendance in study village one was about 75%, and meetings were held only when more than half of the members are present (V1-IIR-10).

In the watershed development intervention, important discussions such as what should be done and on particular watersheds were often discussed during village conferences. The members of the council also participate in village conferences as part of the community. The decisions of the conferences are forwarded to the council and the council affirms the decisions into by-laws. The village administration would use these by-laws as an instrument of intervention. There are by-laws to regulate hill-side enclosure protection which includes

penalties for encroachment and absenteeism during campaign works among others. The speaker of the council framed the role of the council in the watershed development work as follows;

“Without the council, no work could be pushed through. For example, it is only the council that evaluates the quality of work of the watershed. Even when the village administration fails to take its role seriously, the council suggests corrective action. For example, during the initial days of this year’s watershed development work, the turnout of people was not going as per the plan. The council pushed the leaders for better mobilization and we were successful. We also commented on poor quality of the work that was done and corrective measures were taken. The village administration took notice of the council suggestions” (V1-IIR-10).

In one of the village council meetings that the researcher attended in study village one, the meeting was well organized and deliberations were open. Especially when the matter under discussion was within the control of the village, members expressed their views openly. They also challenged the targets of the watershed development was set by the district and imposed on the village. They argued that some of the targets were unreasonable and had been imposed in a top-down fashion. The meeting was organized in a way similar to parliamentary sessions. A report was presented first and then questions and answers followed. Members addressed each other as “honourable” and the council speaker also addressed each member as “honourable”. These performative elements gave the meetings a necessary air of formality and weight. The meeting agenda was comprised of village development issues such as watershed development work, school enrolment and so on.

In terms of inclusiveness, in study village one, members were drawn from the seven designated election sites; hence representing the interests of their small communities. This was interesting because although a village seems like a homogenous unit, farmers from different sub-villages had different problems and interests. However, when it came to deliberation, not all who were included were able to articulate their views equally. Female members, for example, did not contribute during the meetings that the researcher attended. The village development agents were also not satisfied by the village council meetings as they felt that farmers were not using the opportunities to interrogate the village administration. In one of these meetings, a village development agent complained;

“Village councils are not supposed to be like this. In other villages, the council

members bring lots of questions for the village administration during the council meeting and debate on it. You are elected from every sub-village and you are expected to represent the interest of your electorate. However, you come here and do not ask questions, you do not contribute when you are asked; you just want the meeting to end and disperse (V1- Ob-10).

In study village two, the village council has 300 members. In one of the meetings that the researcher attended however, the attendance was only 30 people. In principle, the council meeting are not supposed to be held if attendance is less than 50%. However, that particular instance was the third time that the meeting was called. The previous two meetings were cancelled due to lack of attendance. District experts were also around to attend the meeting and wanted to take the opportunity to deliberate on the problems in the village including the absenteeism of council members. The meeting started two hours later than planned because the chairman of the village was late. Compared to the meetings in study village one, the meetings in this village seemed disorganized. Neither the village manager nor the chair of the village were present for a report, they were engaged in some other business in another office. The district experts had to intervene and call the chair to attend the meeting. The chair came and said that his deputies were absent and he was tied up by another responsibility. Participants complained that council members are often absent from such important meetings, and those who come often are stretched to make decisions in the absence of the majority of members.

The discussion started with watershed development campaign work. No one had prepared a report to present. The development agents and the chairperson just talked about how bad the situation was and went to discussion. This was a meeting which showed that things were out of the control of the local leadership. Everyone blamed everyone else in the meeting for the failed performance. The participants blamed the village cabinet for failing to give strong leadership to the lower level leaders. The village experts also blamed the village chair and the cabinet for their failure to assist the experts in executing their task. The chair on the other hand blamed everyone. He complained that the experts were not living in the village, coming to the village only occasionally. He also blamed his cabinet members who were absent from the village council meeting, the most important meeting in the village. He blamed also the development team leaders and the public for their rebellious attitude towards the watershed development as well as the other development activities in the village. All those who were

present in the meeting showed their frustration that the village leadership mechanisms such as the village cabinet, the village council, development teams, one-to-five teams and even the village experts were incapable of providing proper leadership in coordinating action on the watershed and other development initiatives in their village (V2-Ob-1). The representatives from the district also expressed their frustration in the situation in the village. They blamed the village chair primarily for failing to coordinate even his own cabinet. With regards to the general public they argued that if people were convinced of the watershed development work, they would not abandon it the way they did (V2-Ob-1).

Annual conferences for development agents

Annual conferences are one of the main platforms created by the government to discuss annual developmental work plans. The conferences start with higher-level party led conferences. Then they proceed with conferences for regional, zonal, district and village level experts and political leaders. Once these are completed, the district leadership take the lead in facilitating village level conferences for party members and the general public.

The focus of this analysis is at village level; hence, the discussion here is limited to the village development agents' conference and community conferences. Development agents working at village level need to coordinate their actions with their superiors at district level and local communities at village level. For the village level development work, including watershed development and other natural resource management works, the development agents attend an annual conference at the district level.

The conferences often have two components, skill and attitude components. The skill component was provided for the experts to refresh their knowledge. For those development agents who were new to the profession and were not trained in natural resource management, these conferences offered them a first-hand practical training. The attitude component on the other hand was meant to orient the minds of development agents towards the budget year targets. The name of the conference itself is "performance evaluation and plan orientation". The conferences are held parallel to the annual conference for village administration cabinets. In the experts meeting that the researcher attended, the experts demanded that the conferences be held together with the district political leadership and village administration cabinet as the work often involve coordinated action between them. However, the district agricultural office

head, who was the chair of the conference, argued that the conference was not meant to be a forum for accusations. Rather it was to allow development agents to see their weaknesses and strengths and develop positive attitudes which would be essential in the realization of the annual plan. The development agents interviewed expressed the importance of the conference in developing positive attitude for the annual plan as follows;

“During the attitude training, we were made to reflect on our past year’s achievements, as well as the strengths and weaknesses in our performance over the past year. The main problems identified were a lack of determination, laziness, and procrastination. We evaluated all our works in this regard. The district gave us the insights on our weaknesses and we were asked to discuss possible solutions. We discussed the importance of developing positive attitude towards the work and make ourselves ready for hard work and determination to achieve our goals” (V1-KII-1).

This is a good example of participation as guidance. Often the development agents were not allowed to challenge the targets or work conditions that they face. They were not even allowed to pin point the weaknesses of the district office or experts. When the development agents insisted on being able to do so, the response they were given was that the district leadership has already evaluated itself and identified its weakness. The development agents rather were urged not to externalize problems in their performance and focus on identifying their own weakness and work to overcome them. The district plans and targets were not touchable. The district office performance evaluation of the village development agent was unnegotiable. Instead, the development agents were expected to accept the evaluations from the district, to internalize it and align their attitude towards it. One of the interviewed development agents stated;

“The aim of the training was to enable us to be able to mobilize the community for the campaign work. In the previous year’s conference, we saw that some development agents had a negative attitude towards mobilizing their community for the watershed development work and complain a lot on their work environment. The training was meant to tackle that mentality. We were encouraged to develop a sense of patriotism, to fight laziness, not to focus on the low pay for our work. We need to work hard and bring results. We were told that improving the life of our society should be our pride. We took the lesson and we came with determination to fulfil our mission” (V1-KII).

The researcher observed this during the 2013/14 conference. During the first day of the

conference, the district agricultural office head presented an annual report and opened the floor for discussion. Then the development agents raised a number of critical issues. Two of their main concerns were worth mentioning here. One, they argued that the district put the blame of poor performance of the district agriculture squarely on the development agents, while both the district experts and leadership had contributed their share. Two, the district had not been considering the poor working condition of development agents. They argued that even in things which were within the capacities of the district to improve, it failed the development agents.

However, during the proceedings of the conference, the chair never addressed the issues raised by the development agents. Rather, he created his own sets of questions for further discussion and forced the discussion only in that direction. A final evaluation of the conference by the development agents stated that the chairmanship was not good. He was supposed to allow everybody to say what was in their mind. There was also the complaint that the chairman tried to impose his agenda on them claiming that the leadership had deliberated on it at a higher level. They argued that this hampered the effectiveness of the forum. They also criticized themselves saying that the participants tended not to push hard against the agenda. They argued that they were supposed to fight the dictatorial nature of the chairman but that among the development agents there was a strong fear towards raising a critical voice against the plan presented by the district. They lamented that the forum was only meant to tell them what they should do despite their difficult work condition (GDAO-Ob).

Despite the complaints toward the conference proceeding, the conferences provided the development agents a forum to debate some of their concerns with the representatives from the political and technical leadership in the district. Hence, from an instrumental perspective, the conference enabled the district to instil its 'developmental state' ideology into the minds of the agents. The following quotation from an interview with development agents shows the impact of the training on them;

“I can't explain how important the training was. Attitude is crucial. One needs three things to work, skill, knowledge and attitude. Out of these attitude is very important. If you don't have the attitude even if you have knowledge, it is nothing. It is important for behavioural change. The training helped me see myself. The problems mentioned in the training were reflected in me as well. When I see how crucial it is to

cultivate an appropriate attitude and the importance of this to bring change, I was impressed. I believe that hard work is the key to change. That is how China grew. China used to be as poor as we were. We used to send them food aid. Now it is one of the largest economies in the world. That comes through hard work. They work hard. They believe in what they do and accept the work as useful for them. So it made me change my attitude for a better performance. It helped me to see my weaknesses. The training made me see who I am. For example, I know myself; I don't like working with a fighting spirit. I also see that if I work in a team, I achieve a lot. The training was designed in a way to help us look at our strengths and weaknesses. It also evaluates the district leaders and experts. We got the chance to criticize the district experts and argue on things that they missed in our strengths. Therefore, the training was useful for all of us. There are things that the development agents complain about, that our pay is small, and our benefit is not comparable to what we do. However, we withhold those feelings so as not to spoil our motivation to work (V1-KII-1).

Annual conferences for villagers

The village conferences are held at the beginning of Ethiopian year in September. The conferences are held in two rounds. The first round is for party members and it lasts five to seven days. It is followed by a conference for all the members of the village. The conferences for the party members are held in the village administrative premises. In terms of inclusion, this conference is particularly designed for all party members. The party has youth and female members as well as members from all the sub villages in the village. Hence, there was no systematic exclusion. However, there was a frequent complain by the district that the women and youth wings of the party are weak. Hence, although they are not formally excluded, it is difficult to get them organized and actively involved in party related activities including the annual conferences.

The conferences for the general public are often held at the sub-village level. Hence, in one village there could be two to four such conferences held in parallel at different sub-villages. These conferences are held at sub-village level for two reasons. First, since these conferences are for everybody, there could not be enough space for all the villagers to meet all at once. Hence, they have to divide the total population into smaller groups. Second, these meetings

are crucial for the active mobilization of local communities in village development activities for the whole year. Hence, the organizers want to ensure the presence of as many participants as possible by holding the meetings near the residences of the villagers.

The deliberation processes, for both party members and the general public, are filled with contradictions and manipulations. This is not surprising given the political atmosphere behind the conferences. The deliberation processes demonstrated that the state wanted to use these public spheres as a mechanism of influencing local communities towards its policy agenda, rather than enabling local transformation. This was evident in some of the remarks by the chair of the conferences and the way the conference proceedings were handled. For example, the chair in study village one stated that the objective of the conference, was to motivate party members to work hard to accomplish the 2013/14 plan. Some participants also applauded the importance of the conference in the past years, one participant stated, “These conferences are important. Last year we discussed the problems that reduce our productivity and their possible solutions. Now we can see the results” (V1-Ob-9). Note that the conference was not meant to prepare village plans, but to motivate the villagers to work hard to accomplish plans prepared by the village administration using guidance from the district.

When the conference with party members started, a debate erupted between the conference chair and the participants. The debate arose out of a remark that the chair of the conference made at the beginning of the conference. The chair claimed that the conference would be an opportunity to build consensus by debating ideas. He stated that the ideas that win would be the ones to govern them all. He further said that that is how their party, the EPRDF, does its business and that is how they would do it in the village as well. However, farmers argued against the consecutive six days of meetings and eight hours of meeting per day. They cited problems such as pest outbreak, the need to take care of their livestock and for the women to be able to take care of their children at home. However, the chair was unwilling to compromise saying that the regional government decided the schedule and nothing could not change much. One of the participants complained;

“Now if we oppose these ideas we are afraid that we will be labelled us someone who is against the party. If you told us that the number of days and the number of hours was fixed already, we would have accepted and moved on. However, if you ask us to discuss it, you should be flexible to make changes. We should not be forced” (V1-Ob-9).

There was also another round of debate among the participants themselves. Once the participants settled down after accepting the imposition of the conference schedule by the chair, a debate continued on what to do about those who do not come to the conference. While some of the members argued that a penalty should not be imposed, others insisted on the importance of penalties. Those who were against penalties argued that the conference was party members' conference and people choose to be party members willingly and they should not be penalized for skipping party meetings. Others argued that even though it was a party members' meeting, it is a natural tendency for people to be serious about their commitments when they face penalties. The chairman sided with those who argued that a penalty should be imposed. He then set the penalty, taking the experience from previous years. This, however, made controlling attendance a daunting task for the conference organizers. Every morning of the conference, they had to spend close to one hour of monitoring attendance. Even during the conference, controlling people who snuck out of the conference was dramatic. To ensure that no one left before the conference ended, there were no breaks during the conference. As a result, when the conference ended, participants had to run to use the toilets. A serious control on absentees continued throughout the conference. On the third day of the meeting, upon seeing that attendance was shrinking, the village chair threatened to extend measures including withholding credit access of those who were absent. He said that the EPRDF government provides the credit and not attending an EPRDF meeting is a violation of the authority of the EPRDF. The chair of the conference also complained;

“An army does what it is told to do. If it is asked to stand, go, come, do this or that, it does so without condition. You are an army, but some of you after coming here you tend to do things that you are told not to do or fail to do the things that you are told to do” (V1-Ob-9).

As stated above, from the start of the conference, the chair failed to live by his rhetoric that the guiding principle of the conference would be a mutual struggle with ideas, and that the winning idea would be the one that governed all the party activities afterwards (V1-Ob-9). Throughout the conference proceeding, deliberations were limited to addressing the obstacles of implementation of past year's plan and how to implement the current year's plan. Major decisions about the plan, on the other hand, were already made before the conference. For example, the village development agents based on their own ecological considerations already made the decision on the watershed that would be developed for that particular year. Most of

the soil and water conservation structures to be constructed were also decided in advance. The work standards and schedules were decided at regional level. The government wanted to use the conferences to guide people to accept its predetermined interventions. Hence, the debates in the conferences were often about contextualizing decisions made at higher level as well as some minor decisions which required local level decisions.

To the dismay of the conference chair as well as the village cabinet and development agents, however, the party members were not conceding fully to expectations of their party. In the conference that the researcher attended, the participants repeatedly questioned the utility of the work, the status of the work done in past years, and the work norms set for the campaign (V1-Ob-9). Frustrated by the party members, one of the cabinet members complained during the conference by saying;

“The experience of last year is that, it was the party members that were blocking discussions and decisions with the public during village meetings. They were the once who were asking negative questions.”

When the conference was concluded, there were still differences among party members on major decisions made during the conference. For example, the village manager read out the planned watershed development which included the preparation of three watersheds for development, 206 ha on communal land, 230ha on private plots soil and waters conservation works. A total of 3000 workers and 4367 farm implements would be mobilized to construct the appropriate soil and water conservation techniques. However, it was also planned to increase gully treatment from 33% to 58%. The village manager only briefly read the plan for the participants. In the latter stages, many objected many of the targets to the extent that some members felt that other members were opposing their own party’s plans. The following three quotations from conference participants show the challenge of the conference in convincing the members to buy in to the plan of the village administration;

“When the EPRDF finds itself shaking, it stops, reflects and gives proper solutions. It stood up and cleared its insides. Now we as a village are shaking, hence we need to take time and discuss. In this meeting neither the leadership convinced us nor we convinced the leadership, hence we are about to disperse just like that” (V1-Ob-9).

“Can this plan succeed with the level of the commitment of the party members? Can we accomplish it? We are not taking it seriously, for the sake of our own conscience. It is only few who take the meeting seriously, we do not seem to see that we are

accepting responsibility and we are going to be accountable. Therefore, we fail to discuss the plan thoroughly, how could we lead others and how could others follow us?” (V1-Ob-9)

“The reason why we meet every year for members and village conferences is to assess our performance and get ready for the next year. Hence, when we meet even though our capacities differ, our aim is the same. The forum is meant for a debate of ideas. But, in the past six days, some of us were talking repeatedly and some of you thought of us as talkative, that is not good. Anyways, the conference showed us our weaknesses and strengths. If we see the plan in general, it may seem big, but when we divide it amongst ourselves, it is small. Hence, it is doable and good. Our problem is implementation. We say that those who go to foreign countries and Arab countries are rich. However, we do not see how many hours they work when they go there. There are some problems with this plan, which I think will hold us back. First, the unity of the village cabinet and its strength is questionable. Some say that they are tired and do not want to work anymore. Second, party members’ commitment is questionable. The attendance problem that we have seen the last few days is a reflection of a problem in the members. Not all members are problematic; those who are strong should encourage those who are weak. None of us is asked to go to war, we are asked to wage war against ourselves to improve our income. Moreover, this is not out of our reach. If a member works hard and changes his family, he could easily change his neighbours. Third, development teams’ leaders should be loyal and strong. We need to work hand in hand and change our village for the better” (V1-Ob-9).

In study village two, participation in these kinds of conferences was often poor. One of the respondents said that in the last conference, only one third of the party members and an even lesser number of the general public attended such conferences (V2-IIR-7). Often the conferences had to be rescheduled two or three times before getting enough participants. Even when people come out for the conference, they do so only after a heavy penalty was imposed on non-attendance. As a result, even after coming to the conferences, participants hardly paid attention to the conference proceedings (V2-Ob-7).

The deliberation in the public conference was even more manipulative. The conference organizers seemed knew the upper hand they have on the public. They knew that they could

manipulate them easily. One of the chairs in one of the sub village conferences expressed the situation by saying, “the general public does not have problems, and they are submissive.” He even said that “they are like a river flow; you can lead them to where you want. Rather the party members are the ones who do not comply because they feel that they can oppose us” (V1-Ob-11). In line with this statement, in the sub-village public conference that the researcher attended, the chairman of the conference opened the conference by imposing a decision, right from the start. After introducing the objectives and schedule of the conference, the chair went on to say “first you will give your ideas on the importance of the meeting; you should say that the forum is a must, that it has our life at stake and that it is extremely important to improve production and productivity” (V1-Ob-11). With these opening statements, one could imagine the intimidation that the people would feel throughout the conference proceedings.

In the public conference that the researcher attended in study village one, attendance varied between 250 and 300 out of an expected 370. In another sub-village only seven people were absent out of 197. Attendance in these conferences was mandatory. However, by design the deliberation process was made to be skewed towards the government’s interest. Deviation from the plans and recommendations presented by the chairs was not often entertained. Party members were used to influence the discussion and decisions in the meeting towards what had already been approved at the party member’s conferences. On the reason why the party members’ conferences were held first, the village development agent in study village one stated;

“These are farmers with a better attitude and skill. They are 550 in number. We use them as a technology transfer channel for around 11,000 residents. They are channels for political and technological agendas set by the party and the government. Therefore, we start by reminding them that they are the better off in their community and shoulder the government development agendas. These are people who went through the up and downs of the party. Some of them even participated in the guerrilla fighting of the party. Because of that they accept anything brought about by the party. They may discuss on how to do it, but they will never discard any idea brought about by the party” (V1-KII).

Accordingly, the facilitators influenced the conference proceeding by allowing party members

to speak first in favour of the planned activities. If some members of the community opposed the plans or some aspect of the meeting proceeding, the party members were told to impose “positive pressure” by labelling such an individual as anti-developmental (V1-IIR-11, V1-KII). This often scared non-party member who knew of the absolute control the party and the village administration has on social services.

However, as discussed in the previous paragraphs, party members themselves were not fully convinced of their party agenda. Hence, they often failed to play their role in the general public conferences as planned. One of the party member participants in the sub-village conference that the researcher attended lamented;

“The development team leaders were supposed to talk about how they are trying to set an example and encourage others to work hard. But to our disappointment, they didn’t talk, they just kept quiet” (V1-Ob-11).

There was also some evidence that the conferences enabled some sections of the general community to resist the demands of the village administrations. In the first study village, two of the sub-villages refused to join other sub villages in the next campaign because of the long and arduous distance that they would have to travel to reach the campaign sites. The following quote shows how they managed to negotiate their case;

“Watersheds for development are normally selected by the village development agents and the administration. Of the four watersheds, the first round of the campaign was done on Azeg. Then we worked on Mamuwarecha. Now for this year, the watersheds to be developed were chosen by the experts and local administration. When the people were told about the issue during the conference some complained saying that the chosen sites would force them to travel a long distance. There was resistance. But then they were convinced later after deliberation brought out the rationale for the chosen watersheds. Only those from Dimaka and Fengel complained seriously. Those in Dimaka complained that they could not go up to Fengel and those in Fengel said that they could not come down to Dimaka simply because it was too far and too tiring to travel between these places. After giving it a thought, the village administration decided to choose a place which is half way between Fengel and Dimaka” (V1-IIR-6).

In another occasion, one of the female respondents revealed that there was a problem with the campaign work in one particular sub-village. The conference participants complained that the

sub-village had failed to protect the physical structures that had been constructed in the previous year. Hence this year, people refused to go to that particular sub-village to finish the previous year's work. The decision was left for the conference participants to decide. After a long deliberation and taking into consideration the ecological importance of the watershed work in that particular sub-village, the conference participants decided to give them one more chance (V1-IIR-5).

Decision making in the conferences was dominated more by the facilitators than the participants. Even from the start, the conference facilitators started with a demand for a concession to their agenda. One respondent for example stated, "When the district conference facilitator told us that we would be working on the campaign for 60 days, we fought with him. We fought hard, but in the end the chairman defeated us by imposing the decision" (V2-IIR-3). A female respondent also complained that after they had decided in the conference to work on the watersheds that were near the residencies of the villagers, the village administration changed its mind and made them to distant watersheds (V2-IIR-1). One of the cabinet member in the first study village also admitted that the final implementation depends on not only consensus but also a push from local leaders. Responding to whether the people are convinced of the watershed work and motivated to turn out for the campaign work, the cabinet member admitted;

"Usually people do not like the campaign work; they refuse to go to other places to work and complain about the number of campaign days and number of hours spent each day. However, with the good work of the facilitator during the conferences and pressure from the lead farmers, people decided to accept the campaign work. The conferences give us a good opportunity to explain the benefits of the work. But I would say about 50% of the people do not think of the work as important. We just decided to move on irrespective of people's complains" (V1-IIR-4).

Such limitations on the deliberation processes led to resistance by local communities. When the conference facilitators exhibit unwillingness to compromise their decisions after deliberations, farmers often turn to soft strategies of resistance. This can entail acting non-confrontational during the conference, but then derailing decisions during implementation. One of the local development agents in the second study village complained;

"Oftentimes, farmers do not seem to be interested in making use of these platforms. There are issues that farmers would raise, sometimes against the agendas that the

conference facilitators bring. The farmers in *Kola*, they have no problem with speaking, they speak their mind. However, they have a problem of patience; they do not want to argue with the facilitator on ideas. When the facilitators show resistance, rather than debating, they give up and give in to the demands of the facilitators. I do not remember any occasion where farmers refused completely the decision of the facilitators. What is problematic for us is exactly that. They do not say no when the facilitators impose decisions on them. They say yes, but in the end, they fail to implement the decisions that they agree with. In the end, we the local development agents are the ones responsible. We are blamed if farmers refuse to cooperate with us as per the decisions in the conference” (V2-KII).

Hence, the biggest complaint of the conference by the people was that important decisions were often made against their will. Although the conferences opened a space for deliberation, the spaces were open only to clear obstacles that could impede implementation of pre-planned interventions rather than supporting a genuine transformative process.

One-to-five teams and Development teams

One mechanism created to facilitate interaction among community members, their leaders and local experts was the organization of farmers into one-to-five and development teams. In terms of inclusion, all members of the community are organized into one-to-five teams. However, in study village one, the women work only under the men. This often leaves the voice and contributions of women in the village unrecognized. One of the female interviewees lamented;

“As I told you they don’t involve us in any of these. We work under the men’s team. No woman is told that you are a member of this team or that team. They only call us through our men when they want us or when they report. We are working, but our work is not reported separately. We are working together with the men, but we are not reported in the women group. We the women don’t mobilize ourselves, take responsibility and report our work [...]. We are told that without the woman, the village development work will not be complete. Even in the watershed development campaign, initially we were absent and an instruction came from the district and the village administration that the women should also participate, and we started to participate. We have seen how the work has progressed since then. Therefore, the

women should be strengthened. The traditional culture within the women, a refusal to be led by other women, should be avoided” (V1-IIR-5).

In study village two, the one-to-five teams were practically absent. People even did not know their team members. Interviews with the village development agent show that before the watershed development campaign was organized, the village administration organized a three day orientation meeting to allow people to become acquainted with their one-to-five teams (V2-KII-1). However, this did not seem to help much as community members in the village did not know their team members (V2-IIR-7, V2-IIR-6).

The teams had limited space for deliberation. First, the primary aim of organizing farmers into these teams was to make them serve as an implementation mechanism of the development agendas of the government. In a focus group discussion with development team leaders in study village one, discussants stated the role of the leaders as follows;

“We are leaders to channel the government mission through our one-to-five groups to the people and take justice against those who oppose government agendas. The leaders take the mission, discuss it with the members and implement it. It is meant to facilitate development works and for members to encourage with each other and share knowledge while engaging in development works. Therefore, our teams are good for implementing the government agenda; we also use it to implement village administration agendas. We have been also told that it is better if our farm plots are also adjacent so that we also help each other on our farm. But we are not using our team to help each other on our farm activity” (V1-FGD-1).

Hence, the teams were more of the mechanisms of guidance than transformation. The organizers expect the one-to-five team members to meet every week and their team leaders once every two weeks in their respective localities and deliberate. However, despite the intentions of the organizers, team members neither met nor used the teams to help each other in their private farming activities (V1-IIR-2). Nevertheless, the team leaders report to the village administration that the teams are active and working together as that is what is expected of them (V1-IIR-4). One of interviewees stated

“The one-to-five teams are meant to help us share experiences and good practices. It is meant to help make us challenge each other, ask each other why is it that you did not weed on time, why is it that you did not sow on time, what inputs have you used.

This is what we are told to do by the government. As party members we the leaders of such teams are given more responsibility. We are told to take up the mission of organizing farmers in our villages. We are expected to do this up to our coffee ceremony. However, this is just the rhetoric; we never practiced it (V1-IIR-4).

The more practical way that the teams deliberated was during the watershed campaign days in the field. During the campaign work, each individual is expected to work in his/her respective one-to-five and development team. The village leaders seriously insisted on this as it was the main means of control and organization. Hence, the campaign working days allowed team members to interact and exchange ideas with each other as well as with experts. Experts from different levels also got a chance to interact with each other at the field level. As they worked on their task, farmers exchanged ideas. This at times took the form of jokes and mockery as well, laughing and enjoying a relaxed environment. On one cold campaign work day for example, one of the farmers joked saying, “this was the time to stay home, have a nice breakfast and a cup of coffee.” People around him burst into laughter. On the same day, in another group of farmers one of the team members satirically said “now this place will be planted with soybean, and we will export it”. “That is right”, said the others in his team all laughed. They were making fun of what they were told in public conferences, that they could plant soybeans on the physical structures and sell them for a high export value despite most of the soybeans in previous years failed to germinate.

During the campaign, the village administrators also invented a clever way of encouraging farmers. On the first day of the campaign work the school children would carry signs which read "we the children do not want to inherit degraded land from our parents!" Farmers responded by saying "we won't leave you degraded land." Students that the researcher talked to said that their parents degrade the land by cutting trees, causing erosion and flooding. Now they want their parents to stop this and work hard to rehabilitate their environment. They said that could be done through planting trees, constructing soil and water conservation structures, crop rotation as well as using fertilizer and improved seeds. When asked where they had learned all these, they replied that they had heard it from their parents and from school. One of the farmers was asked how he felt when he heard the kids' slogan. He said that they made him feel responsible. He went on to quote a saying which goes “*abat yabejew, le lij yebejew*,” meaning, when a father does something good, his kids will benefit. He said “the land is for the kids; they are now encouraging us to protect it” (V1-Ob-2).

The leaders of the development team also meet regularly to take as well as report on missions from the village administration. In study village one, these meetings were held every Saturday at the village administration compound. Attendance in these meetings was often low and at times had to be rescheduled due to a lack of participants. For example, in most of these meetings that the researcher attended, attendance was around 30%. In study village two, it was even worse, with attendance well below 10% for a meeting which was held once or twice a month. On respondent lamented “the leaders are supposed to meet every two weeks or once in a month. But we are not doing that. It is just a wish now. We never met” (V2-IIR-7).

In terms of the nature of deliberation, these meetings were often open. The members could speak their mind. Members would often bring up the concerns and positions of their team members and defend their interests. This often brought them into conflict with the village administration. In one meeting for example, two members from two different sub-villages in study village one argued that they were being forced to work in sub-villages with no ecological link with their own sub-villages and it would be hard to convince people to work on the campaign. Another member accused the village administration of sending false reports to the district government that their village was performing well. The discussion went on for a long time, but in the end, the village chair blamed the leaders, saying that they were the ones dragging the work behind, not the people. He argued that the people in the aforementioned sub-villages agreed with the work plan during the public conference and there was no way they would change their mind. He scolded the team leaders saying that while the main purpose of one-to-five teams is to channel down missions from the government, they were performing poorly and dragging the people behind (V1-Ob-15). This exchange shows that the role of one-to-five and development teams is limited to passing down missions from above rather than creating opportunity for genuine engagement with the team members.

Militia meetings

One of the village leaders who was active in the watershed development and management work was the village militia. The researcher attended one of their meetings in both study villages. In study village one, attendance of the meeting was 31 out of expected 62. The meeting agenda was focused on the security of the *kebele* and the role of the militia in the

watershed work. The chair of the meeting was the military chief. The meeting procedure was well coordinated. The militias were organized into teams. Two teams presented their report and the other two teams analysed the report and asked questions. Participants were allowed to speak only within the set agenda if someone attempted to pre-empt something that was on another meeting agenda, other participants would stop him and get him back to the agenda. Those who had additional ideas were supposed to present it at the end of the meeting (V1-Ob-3).

In the watershed development work, the chair of the village administration lamented that he was not getting proper support from the village militia. He complained that the militia members were not setting an example for others by participating in the watershed work actively and forcing those members of the village who were not going out for the watershed development work. Although the militia unit was awarded a certificate of appreciation last year, this year the cooperation of the militia has been too low, the village chairman complained. This opened an interesting discussion. The militia also presented their side of the story. On their active participation, they complained that they have been double tasked with working on the watershed campaign as well as bringing those members of the community who were absent in the watershed work to justice, leaving them exhausted. In regards to bringing others to justice, they also complained that they received an instruction from the district government not to use force unless they get a written instruction from the village social court. Besides, some of the militia members complained that they found themselves socially outcast by their community members when they take them to the social court for absenteeism. This opened a long debate on the role of the militia and further improvements that could be made. They finally agreed to intensify their effort and cooperate with the village administration more closely, warning the village administrators also to abide by the formal procedures of the militia functions in the village (V1-Ob-3).

This was in stark contrast with the experience in study village two, where the militia meeting was disorganized. In the meeting that the researcher attended, the chairman of the meeting was the chair of the village administration. The chairman came an hour later than the meeting time that he himself called for, long after other members arrived. Out of the 47 militia members in the village, only 4 made it to the meeting. The rest were associate militia members who assist the militia since they own firearms. A total of 17 people attended the meeting. The chair went on accusing the militia of not taking orders from him and

undermining his ability to keep order in his village. Then he came up with a new agenda that their village is required to make financial contribution for an initiative by the ruling party. He demanded an on the spot contribution, but the majority refrained to make a payment. The chair went on to say;

“I am sorry that you guys failed to be leaders of the village. You were supposed to take the initiative in this. We have no militia in our village. You proved that you are not responsible people. You are not in line with the EPRDF spirit. You will pay, whether you like it or not. The 79,000 birr quota given for our village will be paid in full, whether you like it or not” (V2-Ob-11).

Many in the meeting complained that the chair was cornering them because of their attendance. They lamented that those who were absent from the meeting were not subjected to the kind of pressure that those who did attend meetings were facing. Many also complained that they were being forced to make decisions with significant number of their members were absent (V2-Ob-11).

7.3.2 Spaces for interaction in the irrigation management intervention

Irrigation management requires close collaboration from a multitude of actors. As it was seen in the previous chapter, the irrigation schemes at the local level brought together different state actors from village level up to the federal level. Hence, action coordination requires the creation of spaces for these actors to interact. This section, however, focuses on the interaction of actors at a more local level, which includes irrigation users and their cooperatives, leaders of irrigation users’ cooperatives and agronomists working with irrigation users.

Annual conferences

One of the spaces created by the KGVDP, starting from the 2013/14 production year was the organization of farmers’ annual conferences. This was in line with the common practice in the agricultural sector in general whereby the production year starts with an annual conference with farmers. Similar to the conferences in the previous section, the conference organized by the KGVDP were also divided between leaders and other members of irrigation cooperatives. The difference between the conferences of the KGVDP and the conferences organized by the agricultural offices was that while the conferences in agricultural offices were often led by the

political wing of the government and had strong political dimensions, the ones organized by KGVDP were technical in nature and led by KGVDP staff.

According to the conference minutes, the first conference was held for four days. The participants included irrigation users' cooperative leaders, village leaders, agronomists and other experts of the KGVDP, 144 participants. The conference program included an evaluation report of the past production year, a field visit to a well performing irrigation cooperative and a discussion of the current year plan. The aim of the conference was to evaluate the past year's performance and introduce the current year plan. In so doing, the organizers aimed at influencing the attitudes of the cooperative leaders who would then go and influence the attitude of their cooperative members. According to the minutes of the conference, the problems identified in the conference as bottlenecks to the effectiveness of the irrigation management in the area were: weak leadership from the cooperative executive committee, negative attitudes of irrigation users towards improved technology packages, poor agricultural input quality and delivery time, weak irrigation user cooperatives, weak farmers organizations within the cooperatives, poor operation and maintenance, problems with maintenance accessories, electric power interruption, water shortage in some projects and road problems in some of the projects.

The conference also came up with decisions on the way forward, giving responsibility to each section of participants. For example, the conference minutes stated that the leaders of cooperative should hold, members conferences, ensure fair distribution of water, set an example of using improved agricultural technologies, hold members meetings once a month, hold block meetings once every two weeks, and hold one-to-five meeting once a week. Experts were advised to introduce the current year plan in conferences with irrigation users and farmers, provide technical training for farmers, strengthen farmers' organizations, and work on improving negative attitudes of farmers towards improved agricultural practices. Ordinary members were also urged to learn improved agricultural practices from their fellow farmers and the agronomists working for them, organize themselves into blocks and one-to-five teams, use the necessary amount of agricultural inputs, accept recommendations and advice of agronomists with sincerity. However, it was not clear from the minutes of the conference whether there was conflict of ideas among the meeting participants and how those conflicts were settled (KGVDPD-6).

Then the leaders and the experts went back to their respective cooperatives and organized conferences for all irrigation users. This was a one-day conference organized for 3969 irrigation users. Attendance in the meeting was 75%. In terms of inclusion, male irrigation users dominated the meeting. This exclusion however, is not limited to the conference. In almost all activities of the cooperatives, the role of women is limited. This has to do with the culture of the area which does not allow active participation of women in farming activities without their husband. Women headed households often have to give their land for sharecropping or get one of their male relatives cultivate their land on their behalf (KGVDP-6).

The report on the conferences indicated that there were some issues which were raised by the participants. For example, the report indicated that there were a significant number of participants who were insisting on using their own traditional agricultural practices and technology. Others did not accept the claim that the effectiveness of the improved seed supplied by the KGVDP was curtailed by inappropriate cultural practices. Rather participants claimed that the improved seeds had quality problems. Others raised serious issues of unfair water distribution because of damage to the irrigation accessories. Still others raised serious complaints about the high cost of inputs and electric power. Overall, however, the conferences provided a forum for leaders, experts and members of cooperatives to deliberate on the activity plan of the year (KGVDP-6).

The researcher also attended two such conferences. One of the conferences was organized for three of the irrigation cooperatives at once. These were new cooperatives with only one round of production experience. There was an open deliberation during the conference as participants were speaking freely. However, everyone eventually started accusing everyone else. The experts were accusing members of not heeding their recommendations in the use of production technologies. The leaders were complaining that members were not coming when meetings were called. Members on the other hand complained that the experts were bringing them technologies which do not work in their context. For example, the previous year the experts had insisted that all members should plant sorghum while the farmers wanted to plant teff. In the end, the sorghum failed, which led the farmers to accuse the experts of blindly siding with their bosses who did not know the farming conditions in the area. They also complained about their cooperative leaders who failed to execute their role properly. Some of the issues that they seriously complained about were related to their newness to the

irrigation project. For example, they resisted the recommendation to produce in cluster and use of improved technologies such as fertilizer and improved seeds. Despite this, however, the conference seemed to give actors an opportunity to express their frustration and lay the ground for a more fruitful engagement in the future. For example, what to plant in the coming production season was heavily discussed (KGVDP-Ob-1).

The conference proceedings overall were not well coordinated. People were talking as they wished and the chair had to struggle to bring everyone together. Things got worse when an agronomist told the participants that those who were planting teff would have to plant in rows. Most farmers seriously objected to the idea. They challenged the agronomist bringing evidence of people in their surrounding who had planted in rows but harvested much less than before. Some of them also mentioned their own experiences, where they had planted a small portion of their land in row with disappointing results. Some argued that the experts often focus on the yield only while farmers consider the yield as well as with the by-products and the cost of production when deciding what to plant. However, the expert insisted that they should plant in rows as per the direction taken by the program office. This led to a confrontation between the agronomist and the participants. The agronomist left the meeting threatening to shut off the water if they don't plant in row. The people responded by insisting that they would rather see the water shut off than row planting (KGVDP-Ob-1).

The second conference that the researcher attended was with two cooperatives that had been operational for over seven years. The difference from the new cooperatives discussed above was clear. In these conferences, there was better attendance. The chairpersons of the two cooperatives also chaired the conference. There was better and open communication between the participants. There were many issues raised, such as problems with the drip irrigation laterals which needed replacement, choice of crops, and problems related to power interruption. The conference gave the participants the opportunity to clear some misconceptions and coordinate their action better. For example, some of the participants complained that the experts forced them to plant crops that were not their choice. The expert on the other hand clarified that the experts did not force farmers, but since the decisions were made in a conference, those who were absent during the conference think that the crops were imposed on them. The cooperative committee members also lamented that they were not able to provide effective leadership as their residences were far from each other. However, they vowed to improve. They agreed to intensify their effort to request the KGVDP to assist them

in procuring a replacement for the laterals of the drip irrigation system. They also vowed to be more serious about controlling absentees in their monthly meetings. Finally, the decision on what to plan in the coming season was made after a lengthy debate and a vote (KGVDP-Ob-2).

In sum, the annual conferences, both for the leaders and the ordinary users served both instrumental and transformative purposes. They had an instrumental element because the program office attempted to guide the production systems towards market orientation and adoption of improved agricultural technologies. However, there were also spaces of decision making left for the irrigation beneficiaries, which were essentially transformative. This was seen from the deliberation process. Although the agronomists at times resorted to direct deliberations to their own interest, they also allowed users to direct deliberations in the direction that suited them. The inclusiveness of the conferences, however, was questionable since women headed households and sharecroppers were not part of these conferences.

Monthly irrigation users' cooperatives meetings

The irrigation cooperatives hold a monthly members' general meeting to discuss issues pertinent to that particular month. The monthly meetings serve three purposes. First, they are the main forum to discuss the overall functioning of the irrigation management in each cooperative. Issues related to water distribution, the financial status of the cooperative, water fee collection and the like were often discussed in these meetings. Second, the meetings were the main mechanism of collective decision making on issues such as choice of crop for the next production season and marketing of products. Third, the meetings were an important source of learning among members and the KGVDP agronomists.

In terms of inclusion, the monthly meetings are open for all registered members of the cooperatives. However, there were two groups of users which often get excluded in such meetings. First, because of their lack of direct involvement in irrigation agriculture, female headed households are practically excluded from such meetings. Rather, they have to send either their sons or male relatives to attend such meetings on their behalf. Second, sharecroppers were also not allowed to participate in the meetings. This creates a big problem as sharecroppers are increasing in number. Many times, members complain that issues of irrigation mismanagement and violation of by-laws are common among sharecroppers. This

has much to do with their exclusion from major decision-making processes such as monthly meetings.

Deliberation in these meetings was often open. The fact that the cooperatives are smaller makes it easier to handle meeting proceedings. There are also no apparent hierarchical differences among members and the limited political interference from the local government makes the cooperative meetings less threatening for members. In two of such meetings that the researcher attended, the deliberation process among the participants was open. For example, in one of the meetings, a decision was to be made on the crop type to be planted in the next production season. The local agronomist forwarded his suggestion; he argued that since it had been a long time since they planted a cash crop and received good benefits, the cooperative should plant onion. He further explained the reason for past years loss was a poor use of agricultural technologies. With some adjustment on the source of failures from last time, the agronomist argued, a better yield of onion could be harvested. He then opened the meeting for a debate. The Farmers debated a lot. They were divided between planning onion and teff. Those who were on the side of planting teff argued that in the previous production seasons, they lost their investment on onion because of poor performance and low market price. Hence, they argued that teff would save them from yet another failure. Those who were on the side of planting onion on the other hand argued that the previous year failures were attributed to negligence on the farmers' side which could be corrected. Despite taking a long time to deliberate, they failed to reach a consensus. Hence, they held a vote and the vote went to planting teff. Afterwards, the discussion continued on the planting date and the technologies to be used (V4-Ob-6).

In the same meeting, an issue of water distribution was raised. The chair of the cooperative complained that the first come first served principle that the cooperative executive committee used was creating a lot of coordination problem. Hence, he told the members that the committee decided to distribute water by block¹⁵. He argued that some people were abusing the system. If they are denied water for some reason, they would take the water from someone else's turn and water their crop. The idea was resisted by some who said that the current system was working well as they did not have to wait for the presence of block leaders to get water. Now, if they have to distribute water in blocks, they argued, the block leaders

¹⁵ For the farrow irrigation users, block members are those who receive water from one water distribution outlet. In one scheme there could be 4-8 blocks depending on the size of the irrigation scheme.

would need to be around all the time. Those who said that the watering should be done in blocks argued that the block option could help to ensure coordinated water scheduling and identify wrong doers such as those who fail to pay their water fees. Finally, it was decided that the distribution should be done by block.

These meetings also gave members and agronomists the opportunity to deliberate on management issues. At times such meetings created a conflict between the two. There were times when the agronomists were forced to compel farmers into decisions made at a higher level. At other times, they were allowed to compromise. One of the experts shared his experience as follows;

“Well, we normally talk at meetings and deliberate. For example, that is what happened during the last season on the teff. We were at Woldia in a meeting with the leaders of the cooperatives and the seed rate was told to be 5 kg per ha. They refused to use 5 kg arguing that only 5 kg per ha is too small to withstand pest attack. After a long deliberation, they were told that the recommended rate is 5 kg per ha but if they insisted they could tolerate up to 10 kg per ha. We agreed on that way and when we came here, it was I who started it here. We deliberated about it in a monthly meeting. The practice was new for farmers. The seed rate was too small, and they were recommended to plant by mixing it with sand. After a long resistance and with an assurance that we will be with them, farmers agreed with the seed rate. I was demonstrated the sowing method for them” (KDVPD-KII-4).

However, the effectiveness of such meetings was curtailed by several factors. First, in almost all of the interviews, the respondents complained that there was very serious problem with meeting attendance. Oftentimes decisions were made with only a handful of members in attendance. Although such decisions were binding and those who were not present know that they have to comply with these decisions, the absentees create a lot of problems during the implementation of decisions. One of the leaders in a focus group discussion complained as follows;

“The members are not uniform. Members come to the project site when they want water. However, when we call them for a meeting, they do not come. When we penalize wrong doers, it is obvious that they complain a lot. We cannot avoid our responsibility, we cannot back down. We are entrusted by our community and we have to do it whether we like it or not” (V4-FGD-3).

Second, cooperatives also had some leadership and logistic limitations. For example, in three of the meetings that the researcher attended, the meetings had no proper proceeding. Most of the cooperatives do not have proper meeting places. Given the hot weather in the area, it was often hard to sit in the open air. As a result, people sat in disarray to get shades to protect themselves from the burning sun, but miss the meeting proceedings. Cooperative leaders also lack some basic skills on handling meetings such as agenda setting and discussion facilitation.

Other meetings

There were other important spaces of interaction, but somehow, they were not used properly. For example, the executive committees of the cooperatives were supposed to meet every two weeks. Interviews with the KGVDP experts showed that the strength of the cooperatives depends on the strength of the leadership (KVDP-FGD). Partly, the strength of the leadership also depends on the frequency and quality of the meetings that the executive committees hold. The executive committees are comprised of 10 people, but often only the chairman, the treasurer and the secretary tend to meet frequently and make decisions. This was reflected in three of the six cooperatives studied and interviews with the experts showed that it is a problem in most of the other cooperatives (V3-FGD-1, V3-FGD-2, V4-FGD, KGVDP-FGD). One participant in a focus group discussion expressed this as follows;

“On meetings, we are not yet serious. Even the chairman is not serious. We are not meeting much. It is only the secretary, the chair and the treasurers who are meeting. Only three of us are actively working. We have by laws; it is even scary, because the penalty is a lot. If I am absent from committee meetings I should be penalized 100 birr. However, we have not started implementing it. As a committee we agreed to be serious, but it is not yet done” (V3-FGD-2).

Partly, the reason for the limited frequency of meetings is that some of the committee members live very far apart from each other. For example, in one of the cooperatives studied, there was a distance of two walking hours between the residences of some of the committee members. This makes it hard to meet as frequently as they want. Overall, however, the problem seemed to be more on the failure of the leaders to take their responsibility seriously. The following quotation from the chairman of a cooperative that was rated as good by the

local agronomist shows the role of the leaders and the importance of meeting and discussing issues as frequently as possible;

“I am the chairman; we have two meetings per week. When the committee is strong, the rest of the members would cooperate easily. If committee members are late, they are penalized. The penalties are incremental, a few minutes late is penalized by 5 birr, coming half way through the meeting is penalized by 10 birr and absenteeism is penalized by 20 birr. We penalize up to 120 birr. We were determined to be serious about the committee. We work hard. For example, when we have to start transplanting seedlings, we the committee start ourselves and plant our seedlings. Once we plant, we immediately employ guards to watch out for livestock. When it is time to prepare our land, we the committee take the lead and start ploughing, the rest start following us. When seeds are sown, we employ guards. Until we harvest, we stay close. We meet twice in a week. We work with the guards closely.”

The other two possible spaces of interaction were water user groups, also called water blocks and one-to-five teams. The water blocks are groups of farmers who share a water distribution schedule. The one-to-five teams are groups of farmers with farm plots adjacent to each other. Members know their block membership as they use it for water distribution and for the collection of water fees. However, the one-to-five teams only exist because it is the government’s general approach to organize farmers in that way. As a result, the one-to-five teams practically did not exist during the fieldwork for this research despite a strong insistence from the program office of their establishment.

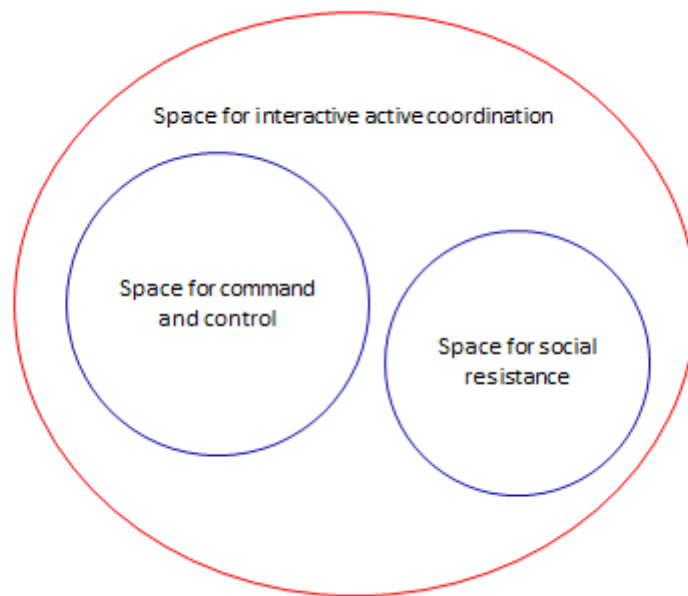
7.4 Forms of learning

Learning is another dimension of the social learning concept. In the social learning literature, learning can mean three different things. The first is the learning of an individual from social interactions. Literature on this dimension of learning focuses on how group based activities such as workshops, training programs or other types of group activities can lead to an increase in the cognitive, affective and/or motor skill domains of a person’s mind (Rist et al. 2007; Rist, Delgado, and Wiesmann 2003). The second is the learning of a network of individuals from their group based activities. Here, the focus is not an individual but a group of two or more people that engages in a common social practice and thereby acquires some form of common cognitive, affective and/or motor skills from their mutual interaction and reflection (Wenger 2000; Lave and Wenger 1991). The third is learning as an emergent property of a

system in response to changes in socio-ecological systems. In this case learning is one dimension of resilience together with self-organization and adaptation (Pahl-Wostl et al. 2007; Armitage et al. 2008).

The discussion in the previous sections as well as the previous chapters shows that action coordination in both the watershed development and irrigation management are a result of a constant struggle between the state's containment strategies and local communities' counter containment strategies. We have also seen that neither the state nor local communities are homogenous entities, but rather are comprised by actors with competing interests. With such circumstances, the space for action coordination left between purely "command and control" and "social resistance" is filled by the development of inter-subjectivity between actors, among both local communities and the state (See Figure 29).

The discussion in the previous two sections presented the deliberation component of social learning as a process. This section will build on the previous section and deal with the learning component of social learning. Learning is seen at the systems level. Hence, a system in this case includes a human system at the watershed or village level for the watershed development intervention and irrigation users and program command area for the irrigation intervention. Hence, this section presents evidence which shows the presence of some form of learning at a particular scale of the system under consideration. This also means that there might be numerous other learning forms at different scales which are not captured by the analysis. This could be either because the learning is at a scale that is not covered by the analysis or because of the latent nature of the learning experiences which makes it hard to observe. Accordingly, two broad sets of learning are identified, passive learning from past experience and active experiential learning.



(Source: Own draft)

Figure 29: Space for action coordination based on social learning

7.4.1 Passive learning from experience

The local communities as well as government experts at different scales are not new to resource management. In watershed development for example, the study areas have been subjected to interventions on soil and water conservation as far back as 1974. In the 1980s, the communities in the study areas participated in a consecutive food for work “development program” which included soil and water conservation as well as afforestation. In recent experiences, most of the rural communities in the study areas have been under the Productive Safety Net Program (PSNP). The PSNP is one of the biggest social protection programs in Africa. The PSNP supports farm families who cannot feed themselves year round by covering their food needs for six month. There are two types of PSNP beneficiaries, those who benefit from the program unconditionally and those who benefit from the program in exchange for contributing their labour for public works. The public work under PSNP includes works on soil and water conservations (Bishop and Hilhorst 2010; Gilligan, Hoddinott, and Taffesse 2009). In addition, since 2010, all rural villages in the study areas have been under an intensive watershed development campaign under the Growth and Transformation Plan of the Ethiopian government (MoFED 2010).

In the irrigation intervention as well, past experiences include various forms of small scale irrigation in the study areas, the experience of early interventions of the KGVDP, and traditional water resource management mechanisms in the study areas. Farmers also have a wealth of experiences in farmers' organizations as well as government led interventions.

These experiences led to a system level learning on technical aspects of the interventions as well as lessons on the pros and cons of the interventions. On the watershed development intervention for example, the following quotations taken from a regional level document, a zonal level expert interview, a district level experts' interview and a village level focus group's discussion respectively show this type of learning.

“Due to several natural resource management and conservation interventions we have been undertaking, we managed to reverse the dangers posed by a high degree of land degradation in many parts of the region. We have learned a lot of lessons from our interventions from 2010 through 2013 in strategic support for people's mobilization based on deliberation and structured organization” (ARAD-2).

“Our zone had been stricken by serious droughts in the past, including the deadliest of the 1965 and 1977 E.C famines. As a result, this area has been under intensive aid intervention, including conservation interventions. [...] So, when we look generally on what we do now and compare it with the way we used to do things in the past, now we have goals that are more concrete. In the past, our main concern was just the environment. We wanted to rehabilitate it; we want it to be green. Now, we have the determination to make sure that the conservation work benefits the people. We want to make sure that what we do is beneficial to the people. Now because of the interventions, farmers are able to retain their soil, we also make sure that the greenery is comprises of more fodder, fruits and useful trees. There are lots of lessons from the past which we use in our current intervention” (NWA0-KII).

“There were NRM works during socialist Derg regime as well. The work was done through peoples 'mobilization'. There were no proper structures like the ones we have now. The concept of watershed was also limited to mountains. The community destroyed all the structures made during the transition period between the Derg and the EPRDF and they have learned the consequences of doing so. They got a big lesson

from those damages and now the farmers take NRM works seriously. They have seen how important the NRM works currently being undertaken are” (GDAO-KII-3).

“First they taught us. They told us that the conservation work will attract better weather. The whole area was deforested with no vegetation cover left on it. We then left most of the hillsides under enclosure and strict management. Now when the grass grows, we understand its usefulness. Initially we resisted the whole idea of the enclosure. There was a lot of resistance; we told them that we have nowhere to send our livestock but the hillsides. But when we see the results now, we are convinced of the usefulness of the intervention” (V2-FGD-2).

The above quotations show that actors at different scales learned various lessons from experiences. These lessons include technical lessons as well as lessons about the general usefulness of the interventions. For example, almost all the documents reviewed and respondents interviewed agreed that the watershed interventions in the past, mainly the ones on the hillsides that include enclosures and conservation techniques have been effective in reducing degradation and increasing vegetation cover. Despite initial resistance by local communities, seeing the experience of rehabilitated hillsides with reduced erosion and flood impacts overtime have given unparalleled lesson on the usefulness of such interventions. The following quotations show the nature of learning among local communities in the study areas;

“The village had a USAID supported soil and water conservation program especially on the hillsides. Because of that, now the hillsides and the gullies are rehabilitated and the people are happy with the benefits. We use these experiences when discussing the current watershed development work. We always talk about these success stories as examples to convince the villagers. Now farmers can evaluate the work done in the past much better, because they have seen the benefits from their experiences” (V2-KII-1).

“People now know the importance of the work. People in this village used to be resistant to come out for a meeting, let alone for development. Now after seeing the results, people are now willing to go out for development” (V1-IIR-6)

The past experiences also equipped local communities with technical skills on soil and water conservation practices. In this regard, we could divide the community in two, those who are

in leadership positions and those who are not. Development agents have been training in the last five years the ones in leadership positions on soil and water conservation techniques. Others have also been working with these leaders over the past few years. This has built the technical skills of many of the local community members. In some of the interviews, the respondents actually argued that the poor performance of the watershed development work could not be attributed to a lack of technical knowledge or skill, as people were already quite knowledgeable (V2-IIR-5, V1-IIR-9). The following is a quotation in line with this argument;

“Some of us had no knowledge of design and construction of conservation measures. Now we know how to properly layout conservation structures. However, people do not feel responsible to work properly. They make mistakes, not because they do not know but because of the ‘I don’t care’, mentality. We are taking care of our land according to the lesson from the watershed. We conserve our soil and water carefully” (V2-IIR-6).

The same has been true in the irrigation intervention. The initial years of irrigation construction in the early and mid-2000’s faced serious resistance from local communities. The same was true for the organization of farmers into irrigation user cooperatives. Because of experiences in cooperative farming, people resisted the idea of cooperatives for irrigation management. However, with time, people started to realize the benefits of both the irrigation intervention as well as their organization into irrigation user cooperatives. The following quotation from one of the focus group discussions supports this argument;

“When the project was started I for one didn’t think that it would be useful. But over time, they explained everything to us. We were then organized into cooperatives and contributed 110 birr as a share in the cooperative, we were complaining a lot. With time, however, people started to realize the benefits. With the onion production, people saw something that they haven’t seen before; they counted a kind of money that they have never seen in their life time” (V4-FGD-3).

People also learned from the experiences of irrigation interventions which were not under the KGVDP. These are irrigation schemes mostly run by traditional institutions or the district agricultural office. Although these irrigation schemes are less formal and less rigid in their control of irrigation users, the lack of organized farmer organizations and technical support make them unable to produce for bigger markets. There were 400 ha under such scheme in the third study village and close to 25 ha in the fourth study village. Farmers often cite these

examples to explain the benefits of the irrigation work and their organization into cooperatives (V3-IIR-4, V4-IIR-4). One of the respondents stated;

“In the KGVDP cooperatives, farmers are coordinated. When they form the cooperative, they knew that they are supposed to work together. The 400 ha, it is divided, some people are members of a cooperative and others are not. Hence, you cannot make them produce for the market. Some grow onion and others potato, which makes it difficult to produce for big markets” (V3-IIR-4).

The problem with this type of learning is that it is passive in nature. As a result, it is hard to control the learning content as well as the process. There is also a possibility of negative learning as well. For example, due to experiences of failure, people in the watershed development intervention were often sceptical of the sustainability of the conservation works on farm plots. Past learning from failed cooperative movements during the socialist regime also curtailed the effectiveness of current irrigation cooperatives. Members find it hard to trust their leaders and the government with their money to build their cooperatives capital (KGVDP-KII-1, V3-IIR-3).

7.4.2 Active learning from recent and current experiences

The second set of learning observed at a system level in both the watershed development as well as the irrigation management interventions was active learning from recent and current experiences. This could be grouped in adaptive learning, experiential learning and/or co-production of knowledge forms. Adaptive learning is learning from policy makers or scientists through purposely-designed resource management interventions. Lessons learned are captured through a deliberate assessment and integrated as the interventions scale up (Armitage et al. 2008). Experiential learning is “learning based on a learning cycle driven by the resolution of the dual dialectics of action/reflection and experience/abstraction” (Kolb and Kolb 2012). Knowledge co-production is a learning form whereby the engagement of actors, in everyday practices produces important lessons for all actors involved (Wenger 2000; Lave and Wenger 1991).

Adaptive learning allows policy makers to experiment with practices on smaller scales and through reflection, learn lessons that allows the scaling up of the practice. There is some evidence that the watershed intervention has been driven by some sort adaptive learning

oriented approach. A zonal document written to give feedback for district level government decision makers states the importance of adaptive learning in the watershed development as follows;

“This year, 2013/14, we planned to start experimenting with natural resource development and protection in small scale pilot programs. After evaluation of our experience and learning lessons from the pilot interventions, we plan to up scale the best practices” (NWZAOD-4).

Accordingly, scaling up the best practices has been an integral part of the watershed development intervention. Districts frequently request village development agents to compile and send their best practices. These practices are then compiled at the zonal and regional level and redistributed back to districts and villages.

Experiential learning involves learning from everyday practices through reflection. Both the interventions had this form of learning built in them. In the watershed development intervention, this often involved the interaction of experts and local communities within their work teams during campaign works. The sources of knowledge were: active experimentation in the field, mutual reflection on the completed work, experience sharing with each other, and lessons from experts in the field. In one instance for example, one group member in a development team working on the campaign said to his teammate, “let us talk now, discussion will make the work good.” He said, “If the stone bund is made the way it is started, it will take a lot of farm land and the owner may destroy it latter. So we have to reduce the bund size a little.” His teammates agreed and corrected the problem on the spot (V1-Ob-6).

The daily work is not only a place for learning technical skills, but also organizational matters. In the first village, those in the campaign work were advised to work only in their development teams and one-to-five teams. This does not happen naturally, as farmers tend to mix, especially within their development team. However, the village leaders insisted that it makes it hard to evaluate the contribution of each member if people mix up. The leaders insist on this partly because that was also one of the evaluation points when experts from the district came to supervise (V1-Ob-6). This made farmers learn to work in their small groups. This was in contrast with the case in the study village two, where by people mix during campaign works.

In the irrigation management, intervention farmers learn from their own experience and the experience of their fellow farmers. The cluster production system created a unique learning opportunity for cooperative members. The cluster system meant that actions of members such as ploughing, planting and watering had to be coordinated. It also meant that members could get a natural experiment to compare the performance of crops based on the type and level of management practices. This also allowed the local agronomists to use the differences as a natural demonstration. The following quotations from an expert's interview and focus group discussions show this aspect of learning;

“What we do is, during meetings we use differences among farmers as a learning experience. We will mention failures by name and make them ashamed in front of others. Members will criticize that person. That person will take his criticism and be told to make improvements for the next season. If I see better practices in other projects, I will take selected members for an experience visit. For example, the teff for my project is said to be good, in the next week they will bring groups from Waja for an experience visit. I also go from farm to farm and give personal advice” (KGVDP-KII-4).

“Well, group approaches are essential. In this area, people take things personally. If they see their neighbour's farm is better off, it is considered laziness to have less performance. Therefore, now people are pulling up to those who are doing better off, those who are performing well are the ones driving others with them. For example, on spacing, apart from what you teach them, they improvise things. Then others see these and become better. They copy each other and closely observe the activities of the other farmers. Now people have a lot of knowledge and experience. Now those people who used to resist fertilizer are experts on the quantity and timing of its application. They are even better experienced than the experts even” (KGVDP-FGD).

The cluster production also allowed irrigation users to form a community of practice with the agronomists working with them. This allowed for the co-creation of knowledge. Farmers often know the nature of their land, its fertility, its exposure to weed and pests, and water holding capacity. The experts on the other hand come with refined and marketable agricultural practices. The best results are achieved when the two sources of knowledge find a smooth mix and co-create in a contextually relevant agricultural practice. The following quotations from a KGVDP expert and a farmer conform to this argument;

“Well, not every technology could bring about the desired change. Practically, the best results are found in the selected use of farmers’ knowledge and expert knowledge. If I give you an example, in the last production season, there was land with a serious striga weed problem. I wanted them to plant maize, and the farmers refused saying that their land is not suitable for maize. We decided to let them plant chickpea instead. Some decided to plant maize though, but it failed completely. Another example is that we usually recommend them to make the spacing between plants large and at times, they make it narrow and get high produce. We learn from these experiences and move with them. In other occasions, they learn from us. For example, on onion, when we first started it, farmers resisted it a lot. They were saying that it is stingy; it is not edible even by the livestock and so on. Once they saw the result, however, they don’t even want to produce anything else” (KGVDP-FGD).

“We innovate and we learn from each other. For example, when the drip irrigation lateral came, we used to plant one row on one side of the lateral and one row on the other side of the lateral. However, if you use proper cultural practices, you can add one more row in each side of the lateral. I heard one young man, a friend of mine, talking about such planting practice and how he got good produce. So, we take such lessons from each other” (V3-IIR-4).

This learning experience is active in a sense that it can be controlled to some extent. The state, the people or both, depending on their power relationship, can control the learning content and process.

7.5 Outcomes of the social learning process: Is there room for transformation?

Following the discussions in the previous sections, it is possible to propose two arguments. The first argument is that even in “interventionist” states, there are often some spaces left from a command and control approach for deliberation and learning approaches. This is because state officials know that they would face stiff resistance from local communities if they rely purely on command and control approaches. They also know that allowing some level of deliberation and learning would actually enhance the effectiveness of their interventions. Hence, they allow a limited space for deliberation and learning in order to soften local resistance and guide local communities to work towards the realization of state objectives.

The second argument is that at times, the instrumental approach for participation can lead to a failure to achieve the intended objectives of an intervention. This is because either local communities might resist even well-meaning interventions because of the approach used or because such an approach fails to bring about the necessary intersubjectively between actors. For example, in the watershed development intervention, the government officials claim that they developed a “developmental army” around the watershed development work. They argue that the development army is built when the EPRDF, the administrative experts and the public develop a shared understanding, skill-set and attitude on developmental issues and implement interventions within the government set strategic directions and organizational arrangements (GDAO-Ob). Utilizing the terminology and concepts used in this research, what the government officials’ claimed was the development of social capital and socio-political efficacy at the village level between party leaders, experts and local community members.

However, the claim that the development army was built around the natural resource management work was contested. As seen in the previous sections, those who oppose the claim of a developmental army in NRM argue against the claim using two arguments, one based around social capital and the other based around socio-political efficacy. First, they argued that if a development army were already built, that would mean that politicians, experts and local communities developed joint social capital to coordinate their action. Such work norm was supposed to be useful in other areas of development interventions in addition to the watershed intervention. The actual experience however, is that local politicians and experts failed to use development and one-to-five teams to promote crop production in the area. Taking this argument, they argue that at best, what the government could claim is that the governmentality structures created around NRM served as an effective mechanism to control and guide local residents in the watershed development intervention (GDAO-Ob).

Second, even in the watershed development intervention itself, the effectiveness of the current intervention was only partial in some areas and failed in other areas. For example, the interventions on the hillsides were effective compared to interventions in flat farm plots. The interventions also failed to stop the destruction of physical structures constructed on farm plots in the previous years. The intervention was also more effective in outputs than outcomes. For example, despite the good performance of the physical structures in

rehabilitating degraded lands, little has changed in the livelihood of the villagers due to the interventions. The opponents of the claim on the creation of the developmental army argue that the socio-political efficacy of the intervention was weak or limited.

The same could be said about the irrigation intervention. Despite the formal organization of irrigation users into cooperatives, the cooperatives did not yet develop into a genuine farmer's organization which defends and promotes their members' interest. Most irrigation users were still sceptical of their cooperatives and the leaders. Without strong trust among members, the cooperatives could not venture into collective capital accumulation. That was seen in most of the cooperatives under the KGVDP where none of them had more financial assets than what was necessary to pay their electric bill and cover some minor maintenances. The cooperatives also failed to control fully the production and marketing process of their members, creating gaps in productivity and performance between members and limiting the diversity of marketable products that the cooperatives produced.

This leaves us with questions such as why do such well-meaning state interventions fail to realize their objective? What are the limitations of the current approach to people's participation? Are there entry points for a transformational approach to people's participation in the existing interventions? These are some of the questions addressed below.

First of all, when a state is involved in resource management linked with local communities' livelihoods, the challenge is often to balance the tendency of the state for command and control approaches and the normative requirements of deliberation and inclusion for sustainable management. It would be naive to dismiss the role of the state all together. In situations where neither the market nor an incentive system exists to encourage farmers to cooperate, a strong state led command and control approach might be a good alternative (Nyssen et al. 2004). Such arguments were often heard from farmers working in the watershed development intervention. Farmers often argued that that if it were not for the state driven and compulsory nature of the intervention, marginal and communal lands would suffer from land degradation. The intervention is also a good case to show that in the face of land fragmentation and a differentiated level of households' capacity to invest in conservation measures, the state intervention could be seen as a social support system to assist those who cannot afford the investment in essential soil and water conservation practices. In both the

watershed development and the irrigation interventions, some visionary farmers made a good use of the interventions and improved their livelihoods.

Despite the well-meaning intentions of the interventions, however, their effectiveness in achieving their intended objectives was curtailed. The major limitation of the interventions lies in the mismatch between the visions, interest and aspiration of the state and that of the local communities. There were concrete reasons why people resisted the interventions. As it was seen in the previous sections, sometimes the recommendations from government experts were not reasonable. They simply do not work in local conditions. Examples abounded in the watershed development work where the state representatives pushed practices even when they knew that they would not be useful. The same was true in the irrigation interventions, where experts pushed farmers to adopt certain technologies even when farmers argued that they had tried them and proved that the practices were not useful in improving their productivity. Some of the recommendations were also in conflict with the local social and ecological contexts of the intervention areas. As we have seen in chapter six, the market oriented irrigation production in areas where producing for the market was not part of the local culture faced resistance. In the watershed development intervention, the fragmented nature of the farmlands and the presence of numerous micro watersheds made it difficult to coordinate action on the village level. Most importantly, however, the interventions faced resistance because the logics of the interventions, which were biased towards a command and control approach and used participation only for instrumental purposes.

Hence, transformational change in both case study interventions is possible within the state politics in Ethiopia. Here, we can talk about strong and weak transformation. Strong transformation would come from a political transformation geared towards improving governance through democratizing the Ethiopian state. This would involve the promotion of a multi-party system, the strengthening civil society, and the maintenance of a free press. However, such a radical approach would find little or no space in current day Ethiopia as the current regime directly or indirectly undermines all such actions as it strives to consolidate more power on its hands (Tronvoll 2010). Hence, what is practical is to target for weak transformation.

Weak transformation in the current political system would aim at improving the governance mechanism within the existing political framework. The Ethiopian government needs to

mainstream some transformative dimensions of its politics for its own sake. Not only would this boost its political legitimacy, but also it would allow it to get the necessary support from the public for its citizen-centred “developmental” agenda. This involves putting its hegemonic ‘developmental state’ ideology in check by making sure that local voices are allowed to decide what development means for them.

As we have seen in the previous chapters, in the current political circumstances of Ethiopia, the governing party officials who are seated at federal or regional levels often decide what counts as development. Little space is left for local control over developmental trajectories. Hence, transformation should start by allowing lower level decision-making bodies such as districts and villages to have a genuine right to decide on and pursue what they consider development. This could be done if higher-level decision makers limit their role to that of setting targets and allowing lower level decision makers to define their own strategy to reach the target. Better yet, lower level decision makers could also be supported in setting their own targets and pursuing them using their own strategy.

In the case studies what this would mean is to open more space for local governments to decide the area that they would want to develop in their watershed development plans, choose the conservation structures that work in their context, decide the timing of the watershed campaigns, and decide the people that have to participate in the campaigns. With such provisions, local governments would be able to engage their communities in genuinely deliberative processes. This requires easing the usual argument against such a move by higher level decision makers which posits that if left without concrete top-down targets, lower level officials would target less ambitious goals and drag down the country’s development ambitions. It requires finding innovative political strategies to induce lower level officials to set ambitious targets. In this regard, the existing practice of fostering a competitive environment by rewarding the best performing local governments could be amplified with more budgetary and other administrative reward systems.

Once the ‘developmental state’ ideology is grounded in local contexts, the next step would be to allow the governmentality strategies of the state to be not only an instrument of influence but also a platform of deliberation for local communities. The possibility of this is already evident in the current political structures. This was evident, for example, in the party members’ conferences for the watershed development intervention. In the study village one where the party politics was strong, the party members challenged the decisions of the

conference chair as well as their village leaders so much so that the leaders including the chair complained that it was as if they were discussing with members of the opposition. This assertiveness could be encouraged in other areas of governmentality such as village councils, annual conferences, development teams and one-to-five teams. This could also enable decision makers at different scales and local communities to take lessons learned either through passive or active learning mechanisms seriously.

This is notwithstanding the need to consider technical innovations as well. In both the watershed development intervention and the irrigation management interventions, the role of local, regional and national research and education institutions was limited. For example, despite the presence of a strong agricultural research institute in the case study area, interviews with researchers in the institute shows that they had no direct involvement in either of the intervention cases studied. As a result, the local politicians and extension professional depend on technical guidelines developed either by regional or even national level experts. The irrigation intervention could, for example, benefit a lot from a market and value chain research and technical innovations which, the current extension and political leadership could not adequately provide.

7.6 Interim conclusion

This chapter aimed at understanding the limitations and potential of transformation within the current social and political context of resource management in Ethiopia using social learning as an analytical framework. The analysis showed that the government created a number of platforms to engage local communities and state actors at different scales. In terms of inclusion, most of the platforms identified include critical state and local community actors. However, in both the watershed development and irrigation management interventions women were systematically excluded because of the prevailing patriarchal culture in the study areas. In terms of deliberation, it was seen that the state often tends to use deliberative processes for instrumental rather than transformational purposes. As a result, deliberations at most allow the state to effectively control and direct local communities for its pre-defined developmental interventions. This also led to an underutilization of learning opportunities. Hence, despite the presence of learning in both passive and active forms, lessons learned seldom led to transformational changes. The current conditions of the interventions could be transformed by opening up more political space within the state hegemonic developmental ideology and the various governmentality strategies.

Chapter Eight

Conclusion

This chapter briefly summarizes the main findings of the study, vis-a-vis the research questions, and provides the core conclusions. The final part of the chapter also provides the outlook for further research.

The first research question of the study was “What social, economic, political and ecological sources of livelihood risks are identified by state and community actors and how do these sources interact to produce livelihood risks in the study areas?” This research question was a result of an observation that recent social science research on vulnerability and adaptation put climate risks at the centre of their analysis (Taylor 2014). This not only obscures other sources of livelihood risks, but also masks the process of livelihood risk production that involves both climate and non-climate sources of risks. The findings of the study show that the core risks that people in the study area face are food insecurity and poverty. These risks mean different things for different sections of the society within the study areas. For some, it makes life a struggle to feed their family, forcing them to live at the verge of famine and food insecurity. For those with a little extra resources or social capital, the level of livelihood risks makes it difficult to sustain themselves with their farming activity only. Still for others who are better off, farming related risks limit their growth and transformation potential (cf. 4.2). There is a difference in opinion among experts and local community members regarding the source of the risks. Each had their own framing of the problem situation and developed a particular set of what are called “risk settings”. A “risk setting” refers to a category of risk that is underlined by a variety of different factors. What was common among both the experts and local community members, however, was the identification of risks settings that put local livelihoods at risk. These major risks settings include naturalized risk settings, subsistence risk settings, demographic risk settings, market volatility risk settings and government policy failure risk settings (cf. 4.3).

It is important to note that there were convergences as well as divergences on the way experts and local communities framed the risk settings. For example, there was a high convergence on the naturalized risk settings, mainly in the climate related risks. Both the expert and local communities identified climate risks as the major source of livelihood risks in the study areas.

Subsistence risk setting was more of the experts' framing than the local community members in the study areas. Experts squarely blame farmers for their precarious livelihood condition, attributing their circumstances to the farmers' laziness, procrastination and resource wasteful agricultural practices. The argument of the experts was that even if climate risks is posing a significant challenge, it would still be possible to cope if farmers were keen to deal with it. Local community members on the other hand focused more on population growth and market volatility risk settings as drivers of their food insecurity, together with climate related risks. They also blame the top-down and at times ineffective government interventions as an exacerbating factor in their precarious livelihood conditions (cf. 4.3).

The five risk settings identified interact in a varied way in the four study villages, producing unique livelihood risks in each village. Accordingly, similar weather condition in a particular year could produce different impacts in different villages. It was also noted that sometimes well-meaning government interventions that were introduced to the community to tackle climate risks and promote local development could interact with existing risk settings in the villages and produce negative results. (cf. 4.5).

With this understanding of risks and risks settings in the study areas, the subsequent chapters assessed two of the case study interventions. The second research question for the two case studies was "In what ways are actions for adaptation coordinated among the state and local communities and how does this coordination influence the effectiveness of adaptation actions?" The concluding statements below present the main messages of each of the chapters.

One of the case study interventions was the national integrated natural resource development and management intervention, also called watershed development intervention. This intervention was chosen as a case study for a study of adaptation due to an increasing recognition of the link between NRM and climate change adaptation such as in the recent IPCC report. This recognition has been a result of a well-established experience in NRM, mainly in land degradation and desertification debates (cf. 5.2). Accordingly, one of the important lessons from the global experiences in NRM with regards to adaptation to climate change is the paradigm shift in resource management from "blame resource users" to "trust resource users" and lately to "collaborate with resource users" as the purely science or community based approaches are challenged by practical experiences of implementations of

interventions. However, this study took a more critical approach to collaborative approaches as they are often presented as managerial challenges, downplaying their deep social and political challenges (cf. 2.4).

In Ethiopian context, the current narrative on the link between natural resource management and climate risk management is a result of a historical experience in dealing with drought and land degradation, involving a number of local, national and global actors. The overall framing of land degradation has a neo-Malthusian nature, with strong criticisms of traditional farming practices and livelihoods as drivers of degradation. Successive governments in the last four decades used these narratives to legitimize their interventions. As a result, NRM has been at the centre of the successive government policies. Currently, resource management is getting even more traction as it is increasingly linked to climate change adaptation and mitigation.

The integrated natural resource management campaign or what is otherwise called community mobilization for watershed development has been active since 2010 and has achieved huge coverage in a short time. The achievements gave the Ethiopian government a positive credit from the international community. Some compared these achievements to the famines of the 1970's and 1980's and claimed that Ethiopia is food secure and greener than it was 140 years ago (cf. 5.3). However, the performance of the intervention differs from place to place. Even within the two study areas, there was significant difference in performance (cf. 5.3). How was the government able to mobilize its population and cover huge areas? What explains the difference in performance of the two study villages? What are the implications of the current approach for adapting to climate risks, both in terms of the technical performance of the intervention and the approach used? The answers to these questions can be found in the political and social processes of the intervention.

The action coordination for the watershed development needs to be seen in light of the broader politics of development in Ethiopia. It could be seen as a result of the struggle between the containment strategies of the state and the counter containment strategies of the people (cf. 5.4). The government enlists large numbers of its citizens for its 'developmental state' ideology by creating a hegemonic ideology around its policies and programs. Party members at different levels are used to enlist others in their area to subscribe to the government ideologies. Resisting any of the prescriptions of the government is considered as

anti-development. This strategy was successful in mobilizing large numbers of rural communities and ensuring huge amounts of soil and water conservation as well as land rehabilitation coverage, both locally and nationally (cf. 5.4.1). In this regard, the government claimed that it built a development army in natural resource management. The argument goes on to say that the governing political party, the expert bureaucracy and the people have similar levels of understanding, attitude and skill sets necessary for NRM. The indicator used to justify this argument was the large coverage of the watershed development campaigns, which was implemented through the social organizations, created by the government, such as village councils, development teams and one-to five teams (cf. 5.4.2). However, this claim was contested by lower rank experts who stated that although it was true that much of the watershed development work used government established social organizations, these organizations were used more as mechanisms of controlling local people rather than forums of genuine negotiation and deliberation. Accordingly, they claimed that the watershed campaigns were implemented by combining coercion with strict social control, rather than deliberation and genuine participation (cf. 5.4.2). Looking at the governmentality strategies of the state could shed more light on our understanding of these competing arguments.

The government fused constitutional based forms of organization with the party politics to govern the watershed development and other developmental interventions. The centralized decision making culture of the governing party, budget dependency of lower level administrative units on higher level administrative units, and complex sets of governmentality projects were all used to translate the state's hegemonic developmental ideology into implementable actions (cf. 5.4.1). Decisions made at the federal level can reach villages in a matter of weeks through the social organizations created at different scales. Information also travels from villages to federal government with relative ease. However, information travelling upward was found to be highly filtered to fit to what the decision makers at top levels wanted to hear (cf. 5.4.2).

The governmentality strategies include both organizations for information dissemination as well as strategies of calculation and controlling from a distance. The village council, development and one-to-five teams and watershed development committees were some of the social organizations aimed at disseminating information and influencing citizens' attitude towards the state's developmental ideology. The use of local by-laws, daily command post evaluations, elaborated calculations of the number of able bodied village members, regular

reporting, and creating of a sense of competition at different scales on the other hand enabled to the government to induce self-control among the residents of the study areas and influence them towards the state led watershed development intervention in their locality (cf. 5.4.2)

However, despite the containment strategies of the state, action coordination for collaboration in the watershed development faced social and political obstacles. The social obstacles include, the individualistic nature of social life in the study areas, the tendency of people to take advantage of other people's work, disappearing customary arrangements for collaborative work, land fragmentation, and the failure of some members of local communities to see the immediate benefits of the watershed development intervention. The government approach, as seen in the previous sections, was not tuned to deal with these complex social issues (cf. 5.4.3). For the government officials, a village is the intervention unit. They homogenize villagers' problems, aspirations and commitments while people even in a same village have different riskscales, dreams and capabilities. In these circumstances, the use of soft power, pseudo democratic hegemony, and governmentality projects by the government did not escape facing resistance from local communities, either in subtle or open ways (cf.5.4.3).

Concerning the political obstacles, although the people were subjected to an unequal power relation with a state that carries the political and economic upper hand, they found their own way of countering the state's containment strategies. Some of these strategies include boycotting the watershed campaign work, destroying conservation structures built in the past, absenteeism and delivering low quality work. The counter containment strategies of the villagers seemed to serve two functions. On the positive side, these strategies helped local communities to avoid soil and water conservation practices that have no practical value or even have negative impacts on their livelihood. The strategies were also sometimes successful in forcing the government to take people's concerns seriously in its subsequent activities. On the negative side, however, the local resistance negatively affected both the quantity and quality dimensions of the resource management interventions (cf. 5.4.3).

The outcome of the watershed intervention was contested. Many of the respondents, both experts and villagers agreed that the watershed development work was successful on the hillsides. The rehabilitated hillsides reduced surface run-off, contributing to a reduction in flood impacts especially in flood prone areas. There was also a general consensus on the fact

that the watershed development intervention, which was a public campaign, allowed those members of the community who could not afford the labour required for conservation works on their own. There were also some sections of respondents who argued that the terraces built on the farm plots are able to trap top soil which would otherwise be carried away by surface run-off. As a result, crops grown near the terraces were observed to perform better. They also argued that the structures could also retain part of the run-off from the farm plot allowing more moisture to remain in the root zone of the crops planted (cf. 5.5).

However, the research also identified some limitations of the interventions both on in its technical dimensions and the approached used. On the technical side, some doubt the usefulness of the physical structures saying that the structures do not conserve moisture well. Others argued that although the watershed work has some benefits, it neither could transform their lives nor could proof them against drought. In terms of the approach used, they argued that while some farmers were benefitting from erosion protection, it was at the expense of others who might suffer from excessive flooding or a loss of fertile sedimentation. The containment strategies of the state also forced people to invest their energy and time on watersheds which have no direct ecological connection with their farm. The top down approach also failed to correct past mistakes or learn from previous failures. It was argued that generally, the intervention failed to translate the conservation gains achieved by the physical works into improvements of local livelihoods (cf. 5.5).

The second case study was an irrigation management project. Because of the dependency of the agricultural sector on rainfall, millions of Ethiopians are forced to live in poverty and with food insecurity. The paradox is that Ethiopia also has a huge water resource potential which should enable the country's agricultural sector to break its dependency on rainfall. There are renewed efforts to expand the irrigation coverage in Ethiopia and huge investments have been invested into large scale, medium and small-scale irrigation schemes (cf. 6.1). These interventions envisage an agricultural sector with a better capacity to withstand climate risks and contribute to national economic growth. Critical studies on irrigation on the other hand emphasise the importance of considering social and political dimensions when trying to understand the implications of irrigation interventions for local communities. It has long been recognized that irrigation requires strong action coordination mechanisms among the actors involved in its management. This is especially true in irrigation schemes where the beneficiaries are smallholder farmers operating on their private plot that must share water for

irrigation. Hence, water distribution, farmers' organization, extension services, operation and maintenance, and as well as the marketing dimensions of irrigation management require a strong action coordination mechanism among irrigation users and between irrigation users and the state (cf. 6.3).

Within the development state narrative in the country, the water sector became a primary focus following the 2002 water sector development program, where irrigation development had been one of the priority areas. Accordingly, the state plays an active role in directing irrigation interventions towards nationally set development priorities. In the case of the KGVDP, the political dimensions of the irrigation management operate at different layers of the state developmental hegemony. The first layer is the overall political environment, where by the development state ideology of the federal government prevails in every development program of the government at all scales. In the second layer is the regional government, which exerts its influence by acting as the channel for the national government's 'developmental state' ideology as well as covering the costs of irrigation infrastructures and the KGVDP operational budget. The third layer of state involvement comes from the KGVDP establishment proclamation and its relationship with local governments at the district level. The constellation of these political hegemonies allows an exclusive decision making power for KGVDP on water distribution, level of production, and technology of production (cf. 6.4.1).

The governmentality strategies of the KGVDP include its control of the steering committee, irrigation cooperatives, the irrigation technologies, and its agronomists. The steering committee coordinates the actions of sector offices which have role in irrigation management in the area. The program office also controls the irrigation users' cooperatives. While in principle the cooperatives were supposed serve the best interests of their members, in practice, however, they only serve as control mechanisms for the program office. Hence, by controlling the cooperatives' operation, combined with its control over the services that the program provides for irrigation users, the KGVDP can influence decisions made by the cooperatives. The irrigation technology also served as a control mechanism by the KGVDP to coordinate irrigation management actions. The technicians at KGVDP had an exclusive access and authority over the switches of the water pumps. If the program office demands something and the cooperatives fail to comply, the experts will use the threat of cutting off the water supply as leverage to make the cooperatives comply (cf. 6.4.2).

However, the effectiveness of these governmentality mechanisms was limited by some critical factors. First, the program had problems with its steering committee. The chair of the committee had no political control over the other actors involved in the committee which seriously undermined the committees' ability to coordinate actions. The use of cooperatives was also limited by the negative attitude of members towards the cooperative model of farmer organization, the top-down formulation of by-laws, the poor implementation of the by-laws by the cooperative executive committees, the limited capacity and lack of trust in the cooperative executive committees and other practical challenges such as sharecropping and landholding size. The use of the water distribution technologies was also limited as some of the technologies such as the drip and sprinkler systems do not allow for sanctions individuals who violate cooperative arrangements (cf. 6.4.2).

Apart from the above operational level challenges of governing the irrigation management, some of the challenges of the governmentality strategies of the state were structural in nature. For example, despite the rhetoric in the program documents on building a "developmental army" among irrigation users, progress so far was very limited. Important political and bureaucratic farmers' organizations such as development teams and one-to-five teams were also absent in the KGVDP. This has to do with the limited political influence that the district government had on the activities of the KGVDP. As a result, the hegemonic 'developmental state' ideology and the associated developmental targets and practices in the agricultural sector did not find the appropriate discursive and organizational structure to reach irrigation users (cf. 6.4.2).

Hence, local communities often met the containment strategies of the state to coordinate irrigation management with overt and covert resistance. The resistance began when the government started constructing the irrigation schemes without consulting users, creating a suspicion about who was going to benefit from the schemes. Even after farmers were convinced that the irrigation schemes were built for them, their resistance continued for some time because of a widespread fear that the schemes would force them to abandon their traditional sorghum crop that takes a longer period to mature compared to other cash crops. Once the irrigation schemes were fully functional, the program office moved forward with its containment strategies to make farmers produce for the market and use improved technologies and practices. When farmers were pushed to accept the program recommendations by the

program experts, despite the fact they could not see the benefits of it, it resulted in widespread hostility towards the intervention which only exacerbated their resistance. This resistance sometimes meant that farmers would reject the recommendations or only use part of the recommended packages (cf. 6.4.3).

The struggle between the state containment and irrigation users' counter containment strategies posed a serious challenge to the irrigation intervention potential to climate proof subsistence farming and stimulate agricultural transformation in the study areas. There were significant productivity gaps among irrigation users indicating the presence of a yield gap which could be attained by existing technologies and practices. One could also conceive of a possibility of introducing technology that is more robust and market innovations that could tap into the existing irrigation potential that is not being realized because of failures to coordinate state and irrigation users' actions properly (cf.6.5).

The containment strategies of the state in general and the program in particular also create their own risks for farmers. The government's development state ideology gives it a discursive advantage in deciding what counts as development and what does not. This created a condition whereby any recommendation from the regional government was accepted by the program office and other operational level offices as "development" irrespective of the contextual relevance of the recommendation for the specific area involved with the recommendation. Some of the recommendations were pushed using coercive measures which cost farmers a great deal when the technologies failed (6.5).

The last chapter brought the discussions in chapter five and six together to see them from a social learning perspective. The chapter addressed the third research question "How do power relations among actors influence the transformative potential of interactive platforms created for adaptation action coordination?" The point of departure for the chapter was that action coordination for resource management is a function of a struggle between a state's containment strategies and local communities' counter containment strategies. Social learning could help to transform action coordination by opening spaces for deliberation and learning to enhance social capital and social/political efficacy of actors, hence mitigating the negative outcomes of conflicts between the state and local communities. Accordingly, the creation/availability of spaces for deliberation, the deliberation processes, and learning forms

were assessed for the watershed development and irrigation management interventions (cf. 7.2).

The conclusion of the chapter was that although a number of spaces of interactions were created to bring the multiple actors for resource management in both interventions, the transformative potentials of the spaces was limited by the government's tendency to use those opportunities for instrumental purposes. In both interventions, women farmers were also systematically excluded because of the prevailing patriarchal culture in the study areas. In terms of deliberation, it was seen that the state tends to use deliberative processes to either sell its predetermined policy directions or to get the cooperation of local people for its policy implementations. As a result, deliberations at most allowed the state to effectively control and direct local communities into cooperation with its pre-defined developmental interventions. However, this does not mean that there were no spaces for transformation in the case study interventions as there was evidence that the spaces created for interaction were also positively used by local communities to challenge and influence government decisions (cf. 7.3).

The use of public spheres/platforms for instrumental purposes also led to missed opportunities for learning. Hence, despite the presence of learning in both passive and active forms, lessons that were learned seldom led to transformational changes. The findings also suggested that the existing conditions of the interventions could be transformed by opening up more political space within the state's hegemonic developmental ideology and the various governmentality strategies (cf. 7.4).

By combining perspectives from the two case studies and the three research questions, this study has led to the following conclusions in terms of implications for adaptation. Note that some of the conclusions are peculiar to Ethiopia and some are general in nature. This is expected as one of the arguments of the study is the need to ground vulnerability and adaptation in social-economic contexts. The concluding remarks are;

1. Experiences in the past and current natural resource management interventions could provide an important insight on how adaptation can unfold in practice. This is because of the strong linkage between climate risks, resource degradation and local livelihoods.

2. Adaptation actions in countries like Ethiopia, where livelihoods are resource based and the land holdings are fragmented, require well managed action coordination among different actors from within and outside of an area undergoing adaptation interventions .
3. For smallholder farmers, livelihood risks have multiple sources, with both material and discursive components. Hence, in a given area these multiple sources of risks interact with each other in a unique way to create unique livelihood risks. What this means is that, even if there is certainty on the presence of climate change impacts in a particular place, the degree of the impact depends on how it interacts with other sources of risks in that place. Hence, it is important for adaptation responses to identify major risks that relevant actors recognized and understand how these risk settings interact to produce livelihood risks.
4. The two case studies provide an insight on adaptation action coordination. Adaptation action coordination between actors with a power imbalance, in our case between the state and local communities, could be seen as a struggle between the state containment strategies and local people's counter containment strategies. The state containment strategies have hegemonic and governmentality dimensions, both of which are essential. While the hegemonic ideology of the state determines what is desirable both in terms of the final outcome and in terms of the process of adaptation, governmentality projects of the state bring the hegemonic ideology to projects and programs which allow the state to plan, control and tangibly direct the actions of other actors. Hence, containment strategies often combine ideology, organization and coercion in a coordinated manner. However, local communities are not passive recipients of the state containment strategies. Depending on their level of social capital and political efficacy, they exert pressure on the state either to influence its action, if not to resist it.
5. Such an understanding of adaptation forces us to reconsider the dominant technocratic approaches to adaptation. When power asymmetry exists among the actors involved in adaptation actions at different levels, the rhetoric on participation and collaboration devolve into a struggle for containment and counter-containment. This reveals the necessity of understanding the social and political dimensions of adaptation.
6. One of the emerging issues in the adaptation debate is the criticism which sees adaptation as maintaining the status quo rather than bringing about transformational change. The debate on what constitutes transformative adaptation is still in the

formative stages. However, two of the common elements often mentioned are: recognizing and accounting for local views or grievances and using social learning approaches. This study provides two lessons as a conclusion in this regard. First, even when the state containment strategies dominate the process of adaptation decision making, there could still be spaces for social learning, as the state requires the legitimacy and cooperation of local communities to implement its policies. Second, unlike the apolitical nature of social learning literature, this research found that both dimensions of social learning, namely deliberation and learning are highly sensitive to political influences. When there is a power asymmetry between the actors involved in adaptation decision making, the powerful actors tend to use social learning processes for instrumental than transformative purposes.

Currently, research on adaptation practice is still in a formative stage. While there are increasing funds on adaptation, actual adaptation projects on the ground are still limited. However, there will still be plenty of opportunities to learn about adaptation as it unfolds in practice. One of the limitations of this study was its primary reliance on local level processes, while the nature of the study requires the consideration of multiple scales. The researcher attempted to fill this gap using methods such as document reviews and experts interviews. However, the researcher's experience at the local level shows that the social and political dimensions of adaptation processes can be captured better by active observation and participation in the decision making events, such as meetings, workshops, conferences and other spaces of interaction among actors at multiple scales. This not only allows an insight on unspoken and sensitive issues but it also provides the opportunity to talk to actors as they make decisions. Hence, future studies could delve more into the technical, political and social dimensions of adaptation action coordination using a multi-scalar approaches.

References

- Adem, Teferi A. 2004. “‘Decentralised There, Centralised Here’: Local Governance and Paradoxes of Household Autonomy and Control in North-East Ethiopia, 1991–2001.” *Africa* 74 (04): 611–32. doi:10.3366/afr.2004.74.4.611.
- Adger, Neil. 2003. “Social Capital, Collective Action, and Adaptation to Climate Change.” *Economic Geography* 79 (4): 387–404. doi:10.1111/j.1944-8287.2003.tb00220.x.
- Adger, Neil, Tor A. Benjaminsen, Katrina Brown, and Hanne Svarstad. 2001. “Advancing a Political Ecology of Global Environmental Discourses.” *Development & Change* 32 (4): 681–715. doi:10.1111/1467-7660.00222.
- Adger, Neil.W. 2012. “Vulnerability.” In *Future climate change: Critical concepts in the environment*, edited by Mark Maslin and Samuel Randalls, 35–62. Milton Park, Abingdon, Oxon, New York: Routledge.
- Adger, W. N. 2006. “Vulnerability.” *Global Environmental Change* 16 (3): 268–81. doi:10.1016/j.gloenvcha.2006.02.006.
- Adger, W. N., Saleemul Huq, Katrina Brown, Declan Conway, and Mike Hulme. 2003. “Adaptation to climate change in the developing world.” *Progress in Development Studies* 3 (3): 179–95. doi:10.1191/1464993403ps060oa.
- Admassie, Yeraswork. 2000. *Twenty Years to Nowhere: Property Rights, Land Management and Conservation in Ethiopia*. Lawrenceville, NJ: Red Sea Press.
- Aggarwal, P. K., W. E. Baethegan, P. Cooper, R. Gommers, B. Lee, H. Meinke, L. S. Rathore, and M.V.K. Sivakumar. 2010. “Managing Climatic Risks to Combat Land Degradation and Enhance Food security: Key Information Needs.” *Procedia Environmental Sciences* 1:305–12. doi:10.1016/j.proenv.2010.09.019.
- Agrawal, Arun. 2005. “Environmentality: Community, Intimate Government, and the Making of Environmental Subjects in Kumaon, India.” *Current Anthropology* 46 (2): 161–90. doi:10.1086/427122.
- . 2010. “Chapter 7: Local Institutions and Adaptation to Climate Change.” In *Social dimensions of climate change: Equity and vulnerability in a warming world*, edited by Robin Mearns and Andrew Norton, 173–98. New frontiers of social policy. Washington, DC: World Bank.
- Alemneh, Dejene. 2003. “Integrated Natural Resources Management to Enhance Food Security Approaches in Ethiopia: The Case for Community-Based.” Environment and Natural Resource Working Paper 16. Unpublished manuscript, last modified May 13, 2015. <http://www.fao.org/docrep/005/y4818e/y4818e00.HTM>.
- ANRS. 2006. *Cooperatives Proclamation 134/2006*. Bahir Dar. Amhara National Regional State Council.
- Argyris, Chris, and Donald A. Schön. 1974. *Theory in practice: Increasing professional effectiveness*. 1st ed. San Francisco: Jossey-Bass Publishers.
- Armitage, Derek, Melissa Merschke, Ryan Plummer, and Melissa Marschke. 2008. “Adaptive co-management and the paradox of learning.” *Global Environmental Change* 18 (1): 86–98. doi:10.1016/j.gloenvcha.2007.07.002.

- Arnall, Alex, Uma Kothari, and Ilan Kelman. 2014. "Introduction to politics of climate change: discourses of policy and practice in developing countries." *The Geographical Journal* 180 (2): 98–101. doi:10.1111/geoj.12054.
- Asfaw, Adugna. 2007. "The role of introduced sorghum and millets in Ethiopian agriculture." *Journal of SAT Agricultural Research* 3 (1).
- Assefa, Kebebew, Seyfu Ketema, Hailu Tefera, Henry T. Nguyen, Abraham Blum, Mulu Ayele, Guihua Bai, Belay Simane, and Tiruneh Kefyalew. 1999. "Diversity among germplasm lines of the Ethiopian tef [*Eragrostis tef* (Zucc.) Trotter]." *Euphytica* 106 (1): 87–97. doi:10.1023/A:1003582431039.
- Awulachew, Seleshi. 2010. "Irrigation potential in Ethiopia: Constraints and opportunities for enhancing the system."
- Awulachew, Seleshi B., and Mekonen Ayana. 2011. "Performance of Irrigation: An assessment at different scales in Ethiopia." *Ex. Agric.* 47 (S1): 57–69. doi:10.1017/S0014479710000955.
- Ayele, Zemelak. 2011. "Local government in Ethiopia: still an apparatus of control?" *Law, Dem. & Dev.* 15 (1). doi:10.4314/idd.v15i1.7.
- Ayers, J., and D. Dodman. 2010. "Climate change adaptation and development I: the state of the debate." *Progress in Development Studies* 10 (2): 161–68. doi:10.1177/146499340901000205.
- Bach, Jean-Nicolas. 2011. "Abyotawi democracy: neither revolutionary nor democratic, a critical review of EPRDF's conception of revolutionary democracy in post-1991 Ethiopia." *Journal of Eastern African Studies* 5 (4): 641–63. doi:10.1080/17531055.2011.642522.
- Barnett, Clive. 2005. "The consolations of 'neoliberalism'." *Geoforum* 36 (1): 7–12. doi:10.1016/j.geoforum.2004.08.006.
- Bassett, Thomas, and Donald Crummey, eds. 2003. *African Savannas: Global Narratives & Local Knowledge of Environmental Change*. Oxford: Currey [u.a.].
- Bassett, Thomas J., and Charles Fogelman. 2013. "Déjà vu or something new? The adaptation concept in the climate change literature." *Geoforum* 48:42–53. doi:10.1016/j.geoforum.2013.04.010.
- Bates, Thomas R. 1975. "Gramsci and the Theory of Hegemony." *Journal of the History of Ideas* 36 (2). 351-366.
- Beck, U. 2010. "Climate for Change, or How to Create a Green Modernity?" *Theory, Culture & Society* 27 (2-3): 254–66. doi:10.1177/0263276409358729.
- Berkes, Fikret, Derek R. Armitage, and Nancy Doubleday. 2007. *Adaptive co-management: Collaboration, learning, and multi-level governance*. Sustainability and the environment. Vancouver [B.C.]: UBC Press.
- Bernard, H. R., and Gery W. Ryan. 2010. *Analyzing qualitative data: Systematic approaches*. Los Angeles [Calif.]: SAGE.
- Bewket, Woldeamlak. 2007. "Soil and water conservation intervention with conventional technologies in northwestern highlands of Ethiopia: Acceptance and adoption by farmers." *Land Use Policy* 24 (2): 404–16. doi:10.1016/j.landusepol.2006.05.004.
- . 2011. "Farmers' Knowledge of Soil Erosion and Control Measures in the Northwestern Highlands of Ethiopia." *African Geographical Review* 30 (2): 53–70. doi:10.1080/19376812.2011.10539143.

- Bewket, Woldeamlak, and Declan Conway. 2007. "A note on the temporal and spatial variability of rainfall in the drought-prone Amhara region of Ethiopia." *International Journal of Climatology* 27 (11): 1467–77. doi:10.1002/joc.1481.
- BFED. 2011. "Amhara National Regional State Profile." http://www.amharabofed.gov.et/about_ANRS.html.
- Bhaskar, Roy. 2010. "Contexts of Interdisciplinarity: Interdisciplinarity and Climate Change." In *Interdisciplinarity and Climate Change: Transforming Knowledge and Practice for Our Global Future*, edited by Roy Bhaskar, Cheryl Frank, Karl Hoyer, Petter Naesse, and Jenneth Parker. 1st ed., 1–24. London: Routledge.
- Biot, Yvan, Piers M. Blaikie, Cecile Jackson, and Richard Palmer-Jones. 1995. *Rethinking Research on Land Degradation in Developing Countries*: The World Bank.
- Birkmann, J., O. D. Cardona, M. L. Carreño, A. H. Barbat, M. Pelling, S. Schneiderbauer, S. Kienberger et al. 2013. "Framing vulnerability, risk and societal responses: the MOVE framework." *Nat Hazards* 67 (2): 193–211. doi:10.1007/s11069-013-0558-5.
- Birkmann, Jörn. 2012. "Measuring vulnerability to promote disaster-resilient societies and to enhance adaptation: Discussion of conceptual frameworks and definitions." In *Measuring vulnerability to natural hazards: Towards disaster resilient societies*, edited by Jörn Birkmann. 2nd ed., 9–78. Tokyo, Bristol: United Nations University Press; University Presses Marketing [distributor].
- Bishop, Carly, and Dorothea Hilhorst. 2010. "From food aid to food security: The case of the Safety Net policy in Ethiopia." *J. Mod. Afr. Stud.* 48 (02): 181–202. doi:10.1017/S0022278X10000248.
- Black, Richard, Bennett, Stephen R G, Sandy M. Thomas, and John R. Beddington. 2011. "Climate Change: Migration as Adaptation." *Nature* 478 (7370): 447–49. doi:10.1038/478477a.
- Blaikie, Piers. 2006. "Is Small Really Beautiful? Community-based Natural Resource Management in Malawi and Botswana." *World Development* 34 (11): 1942–57. doi:10.1016/j.worlddev.2005.11.023.
- Blaikie, Piers M. 1985. *The Political Economy of Soil Erosion in Developing Countries*. 1st ed. Longman development studies. London: Longman.
- Bohle, H. G. 2001. *Vulnerability and Criticality: Perspectives from Social Geography*. Newsletter of the International Human Dimensions, no. 2: 1–7.
- BoWRD. 2011. *Growth and transformation plan*. Bahir Dar, Ethiopia.
- Bridge, G. 2014. "Resource geographies II: The resource-state nexus." *Progress in Human Geography* 38 (1): 118–30. doi:10.1177/0309132513493379.
- Bryant, R. L. 1998. "Power, knowledge and political ecology in the third world: a review." *Progress in Physical Geography* 22 (1): 79–94. doi:10.1177/030913339802200104.
- Bues, Andrea, and Insa Theesfeld. 2012. "Water Grabbing and the Role of Power: Shifting Water Governance in the Light of Agricultural Foreign Direct Investment." *Water Alternatives* 5 (2): 266–82.
- Burkett, V. R., A.G. Suarez, M. Bindi, C. Conde, R. Mukerji, M.J. Prather, A.L. St. Clair, and G.W. Yohe. 2014. "Pointof Departure." In IPCC 2014, 169–94.

- Burkhalter, Stephanie, John Gastil, and Todd Kelshaw. 2002. "A Conceptual Definition and Theoretical Model of Public Deliberation in Small Face-to-Face Groups." *Commun Theory* 12 (4): 398–422. doi:10.1111/j.1468-2885.2002.tb00276.x.
- Campbell, Donovan, David Barker, and Duncan McGregor. 2011. "Dealing with drought: Small farmers and environmental hazards in southern St. Elizabeth, Jamaica." *Applied Geography* 31 (1): 146–58. doi:10.1016/j.apgeog.2010.03.007.
- Cannon, Terry, and Detlef Müller-Mahn. 2010. "Vulnerability, resilience and development discourses in context of climate change." *Nat Hazards* 55 (3): 621–35. doi:10.1007/s11069-010-9499-4.
- The Amhara National Regional State Kobo-Girana Valley Development Program Office Re-establishment, Council of Regional Government Regulation;. Regulation No. 77/2011. CARS. The Council of the Amhara National Regional State 1.
- Chinigò, Davide. 2014. "Decentralization and agrarian transformation in Ethiopia: extending the power of the federal state." *Critical African Studies* 6 (1): 40–56. doi:10.1080/21681392.2014.853986.
- Chisholm, Nick, and Woldehanna Tassew. 2012. "Chapter 8. Managing watersheds for resilient livelihoods in Ethiopia." In *Development Co-operation Report 2012*, edited by OECD, 109–22. Paris: Organisation for Economic Co-operation and Development.
- Collins, Kevin, and Ray Ison. 2009a. "Editorial: living with environmental change: adaptation as social learning." *Env. Pol. Gov.* 19 (6): 351–57. doi:10.1002/eet.520.
- . 2009b. "Jumping off Arnstein's ladder: social learning as a new policy paradigm for climate change adaptation." *Env. Pol. Gov.* 19 (6): 358–73. doi:10.1002/eet.523.
- Conway, D. 2000. "Some aspects of climate variability in the north east Ethiopian highlands-Wollo and Tigray." *Ethiopian Journal of Science* 23 (2): 139–61.
- Conway, Declan, and E. L. F. Schipper. 2011. "Adaptation to climate change in Africa: Challenges and opportunities identified from Ethiopia." *Global Environmental Change* 21 (1): 227–37. doi:10.1016/j.gloenvcha.2010.07.013.
- Crummey, Donald, and Alex Winter-Nelson. 2003. "Farmer Free Planting in Wollo, Ethiopia: 1937-1997." In Bassett and Crummey 2003, 91–120.
- CSA. 2007. *Population and Housing Census Report-Amhara Region-2007*. Addis Ababa.
- Cundill, G., and R. Rodela. 2012. "A review of assertions about the processes and outcomes of social learning in natural resource management." *Journal of Environmental Management* 113:7–14. doi:10.1016/j.jenvman.2012.08.021.
- Cutter, S. L. 1996. "Vulnerability to environmental hazards." *Progress in Human Geography* 20 (4): 529–39. doi:10.1177/030913259602000407.
- D'Odorico, Paolo, Abinash Bhattachan, Kyle F. Davis, Sujith Ravi, and Christiane W. Runyan. 2013. "Global desertification: Drivers and feedbacks." *Advances in Water Resources* 51:326–44. doi:10.1016/j.advwatres.2012.01.013.
- Daniels, Steven E., and Gregg B. Walker. 1996. "Collaborative learning Improving public deliberation in ecosystem based management // Collaborative learning: Improving public deliberation in ecosystem-based management." *Environmental Impact Assessment Review* 16 (2): 71–103. doi:10.1016/0195-9255(96)00003-0.

- Davis, Kristin, and Margaret Korma. 2013. "Extension and Advisory Services for Facilitating Sharing of Agricultural Innovations." In *Africa Agriculture Status Report: Focus on Staple Crops*, edited by Alliance for a Green Revolution in Africa, 150–61. Nairobi, Kenya.
- Dessalegn, Rahmato. 1984. *Agrarian Reform in Ethiopia*. Uppsala: Scandinavian Inst. of African Studies.
- . 2003. "Littering the Landscape: Environmental Policy in Northeast Ethiopia." In Bassett and Crummey 2003.
- de Waal, A. 2013. "The theory and practice of Meles Zenawi: A reply to to Rene Lefort." *African Affairs* 112 (448): 471–75. doi:10.1093/afraf/adt022.
- Dryzek, J. S. 2005. "Deliberative Democracy in Divided Societies: Alternatives to Agonism and Analgesia." *Political Theory* 33 (2): 218–42. doi:10.1177/0090591704268372.
- Eakin, Hallie, and Amy L. Luers. 2006. "Assessing the Vulnerability of Social-Environmental Systems." *Annu. Rev. Environ. Resourc.* 31 (1): 365–94. doi:10.1146/annurev.energy.30.050504.144352.
- Eguavoen, Irit, Demeku Sisay, Teklewold Tilaye, Matthew McCartney, Ben Adol Otto, and Saeed Seidu Billa. 2012. "Digging, Damming or Diverting? Small-Scale Irrigation in the Blue Nile Basin, Ethiopia." *Water Alternatives* 5 (3): 678–99.
- Eguavoen, Irit, and Weyni Tesfai. 2012. "Social impact and impoverishment risks of the Koga irrigation scheme, Blue Nile basin, Ethiopia." *AFRIKA FOCUS* 25: 39–60.
- Ekers, Michael, and Alex Loftus. 2008. "The power of water: developing dialogues between Foucault and Gramsci." *Environ. Plann. D* 26 (4): 698–718. doi:10.1068/d5907.
- Ekers, Michael, Alex Loftus, and Geoff Mann. 2009. "Gramsci Lives!". *Geoforum* 40 (3): 287–91. doi:10.1016/j.geoforum.2009.04.007.
- Emana, Bezabih. 2009. "Cooperatives: a path to economic and social empowerment in Ethiopia." 3rd ed. (CoopAFRICA working paper.
- Faysse, Nicolas. 2006. "Troubles on the way: An analysis of the challenges faced by multi-stakeholder platforms." *Natural Resources Forum* 30 (3): 219–29. doi:10.1111/j.1477-8947.2006.00112.x.
- FDRE. 1995. *Constitution of the Federal Democratic Republic of Ethiopia*. Addis Ababa.
- . 2015. *Ethiopia's Climate Resilient Green Economy: Climate Resilience Strategy*. Agriculture and Forestry. Addis Ababa.
- Ferguson, James, and Larry Lohmann. 1994. "The Anti-Politics Machine: "Development" and Bureaucratic Power in Lesotho." *The Ecologist* 24 (5).
- Few, Roger. 2001. "Containment and counter-containment: planner/community relations in conservation planning." *The Geographical Journal* 167 (2): 111–24. doi:10.1111/1475-4959.00011.
- Forsyth, Tim. 2001. "Critical Realism and Political Ecology." In *After postmodernism: An introduction to critical realism*, edited by José López and Garry Potter, 146–56. London, New York: Continuum.
- . 2003. *Critical Political Ecology: The Politics of Environmental Science*. 1st ed. London: Routledge.

- . 2008. "Political ecology and the epistemology of social justice." *Geoforum* 39 (2): 756–64. doi:10.1016/j.geoforum.2006.12.005.
- Füssel, Hans-Martin, and Richard J. T. Klein. 2006. "Climate Change Vulnerability Assessments: An Evolution of Conceptual Thinking." *Climatic Change* 75 (3): 301–29. doi:10.1007/s10584-006-0329-3.
- Garschagen, Matthias. 2014. *Risky Change? Vulnerability and Adaptation Between Climate Change and Transformation Dynamics in Can Tho City, Vietnam*. Geographie Band 15: Franz Steiner Verlag Wiesbaden gmbh.
- Gebresenbet, Fana. 2015. "Securitisation of development in Ethiopia: the discourse and politics of developmentalism." *Review of African Political Economy* 41 (sup1): S64–S74. doi:10.1080/03056244.2014.976191.
- Gesese, Kune, and Ignatious Mberengwa. 2012. "The Role of Off and On-Farm Activities in Achieving Sustainable Rural Livelihoods Security in Gubalafto Woreda, North Wollo Zone, Ethiopia." *Journal of Sustainable Development in Africa* 14 (5): 126–43.
- Getnet, Urgessa. 2013. "Spatial and Temporal Uncertainty of Rainfall in Arid and Semi Arid areas of Ethiopia." *Science, Technology and Arts Research Journal* 2 (4): 106–13. doi:10.4314/star.v2i4.19.
- Gilligan, Daniel O., John Hoddinott, and Alemayehu S. Taffesse. 2009. "The Impact of Ethiopia's Productive Safety Net Programme and its Linkages." *Journal of Development Studies* 45 (10): 1684–1706. doi:10.1080/00220380902935907.
- Gleick, Peter H. 2014. "Water, Drought, Climate Change, and Conflict in Syria." *Wea. Climate Soc.* 6 (3): 331–40. doi:10.1175/WCAS-D-13-00059.1.
- Habtamu, Admassu, Getinet Mezgebu, Timothy Thomas, Michael Waithaka, and Miriam Kyotalimye. 2013. "Chapter 6: Ethiopia." In *East African agriculture and climate change: A comprehensive analysis*, edited by Michael Waithaka, Gerald Nelson, Timothy Thomas, and Mariam Kyotalimye, 149–82. Washington, DC: International Food Policy Research Institute.
- Hagos, Fitsum, Gayathri Jayasinghe, Seleshi B. Awulachew, Mekonnen Loulseged, and Aster D. Yilma. 2012. "Agricultural water management and poverty in Ethiopia." *Agricultural Economics* 43:99–111. doi:10.1111/j.1574-0862.2012.00623.x.
- Hanson, Paul W. 2012. "Toward a more transformative participation in the conservation of Madagascar's natural resources." *Geoforum* 43 (6): 1182–93. doi:10.1016/j.geoforum.2012.03.005.
- Herrmann, S. M., and C. F. Hutchinson. 2005. "The changing contexts of the desertification debate." *Journal of Arid Environments* 63 (3): 538–55. doi:10.1016/j.jaridenv.2005.03.003.
- Hoggart, Keith, Loretta Lees, and Anna Davies. 2002. *Researching Human Geography*. 1st ed. London: Arnold [u.a.].
- Hulme, M., and M. Mahony. 2010. "Climate change: What do we know about the IPCC?" *Progress in Physical Geography* 34 (5): 705–18. doi:10.1177/0309133310373719.
- Hulme, Mike. 2008. "Geographical work at the boundaries of climate change." *Transaction of Intitute of British Geographers* 33: 5–11. Accessed January 17, 2013.
- Hurni, Hans, Abate Solomon, Bantider Amare, Debele Berhanu, Eva Ludi, Brigitte Portner, Yitiferu Birru, and Zeleke Gete. 2010. "Land Degradation and Sustainable Land Management in the

- Highlands of Ethiopia.” In *Global change and sustainable development: A synthesis of regional experiences from research partnerships*, edited by Hans Hurni and Urs Wiesmann, 187–207. Perspectives / Swiss National Centre of Competence in Research (NCCR) North-South, University of Berne, Institute of Geography vol. 5. Berne: NCCR North-South.
- IPCC, ed. 2012. *Managing the risks of extreme events and disasters to advance climate change adaptation: Special report of the Intergovernmental Panel on Climate Change*. With the assistance of Field, C.B V. Barros, T.F Stocker, D Qin, D.J Dokken, K.L Ebi, M.D Mastrandrea, K.J Mach et al. New York: Cambridge University Press.
- . 2014a. “Climate Change Fifth Assessment Synthesis Report: Summary for Policymakers.”
- , ed. 2014. *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part a: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*[Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (Eds.)]. 1st ed.
- . 2014b. “Summary for Policymakers.” In *Climate Change 2013: The Physical Science Basis; Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, edited by T. F. Stocker, D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex, and P.M. Midgley. 1st ed. New York: Cambridge Univ. Press.
- Ison, Ray, Chris Blackmore, and Benjamin L. Iaquinto. 2013. “Towards systemic and adaptive governance: Exploring the revealing and concealing aspects of contemporary social-learning metaphors.” *Ecological Economics* 87:34–42. doi:10.1016/j.ecolecon.2012.12.016.
- Ison, Ray, Niels Röling, and Drennan Watson. 2007. “Challenges to science and society in the sustainable management and use of water: investigating the role of social learning.” *Environmental Science & Policy* 10 (6): 499–511. doi:10.1016/j.envsci.2007.02.008.
- Ison, Raymond, ed. 2008. *Reprising “wicked problems”: social learning, climate change adaptation and the sustainable management of water*.
- Jasanoff, S. 2010. “A New Climate for Society.” *Theory, Culture & Society* 27 (2-3): 233–53. doi:10.1177/0263276409361497.
- Jones, Roger, Anand Patwardhan, Stewart Cohen, Suraje Dessai, and Annamaria Lammel. 2014. “Foundations for Decision Making.” In IPCC 2014, 195–228.
- Kassie, Menale, John Pender, Mahmud Yesuf, Gunnar Kohlin, Randy Bluffstone, and Elias Mulugeta. 2008. “Estimating returns to soil conservation adoption in the northern Ethiopian highlands.” *Agricultural Economics* 38 (2): 213–32. doi:10.1111/j.1574-0862.2008.00295.x.
- Kato, Edward, Claudia Ringler, Mahmud Yesuf, and Elizabeth Bryan. 2009. “Soil and Water Conservation Technologies: A Buffer against Production Risk in the Face of Climate Change? Insights from the Nile Basin in Ethiopia.” IFPRI Discussion Paper 00871.
- Keeley, James, and Ian Scoones. 2000. “Knowledge, power and politics: the environmental policy-making process in Ethiopia.” *The Journal of Modern African Studies* 38 (1): 89–120.
- . 2004. “Understanding policy processes in Ethiopia: a response.” *J. Mod. Afr. Stud.* 42 (1): 149–53. doi:10.1017/S0022278X03004476.
- Keen, Meg, Valerie A. Brown, and Rob Dyball, eds. 2005. *Social learning in environmental management: Towards a sustainable future*. London, Sterling, VA: Earthscan.

KGVDP, ed.

- Khan, Mohammad. 2013. "Theoretical frameworks in political ecology and participatory nature/forest conservation: the necessity for a heterodox approach and the critical moment." *Journal of Political Ecology* 20: 460–72.
- Knutson, Thomas R., John L. McBride, Johnny Chan, Kerry Emanuel, Greg Holland, Chris Landsea, Isaac Held, James P. Kossin, A. K. Srivastava, and Masato Sugi. 2010. "Tropical cyclones and climate change." *Nature Geosci* 3 (3): 157–63. doi:10.1038/NGEO779.
- Kolb, Alice Y., and David A. Kolb. 2012. "Experiential Learning Theory." In *Encyclopedia of the Sciences of Learning*, edited by Norbert M. Seel, 1215–19: Springer US.
- Lakew, Berhane, Yitbarek Semeane, Fekadu Alemayehu, Hailu Gebre, Stefania Grando, van Leur, Joop A. G., and Salvatore Ceccarelli. 1997. "Exploiting the diversity barley landraces in Ethiopia." *Genetic Resources and Crop Evolution* 44 (2): 109–16. doi:10.1023/A:1008644901982.
- Lakew, Desta, Valli Carucci, Wendem-Ageliehu Asrat, and Abebe Yitayew. 2005. "Community-based Participatory Watershed Development: A Guideline."
- Lave, Jean, and Etienne Wenger. 1991. *Situated learning: Legitimate peripheral participation*. Learning in doing. Cambridge [England], New York: Cambridge University Press.
- Leach, Melissa, and Robin Mearns. 1996. "Environmental Change and Policy: Challenging Received Wisdom in Africa." In *The Lie of the Land: Challenging Received Wisdom on the African Environment*, edited by Melissa Leach and Robin Mearns. 1st ed., 1–33. African issues. London: International African Institute u.a.
- Leach, Melissa, Robin Mearns, and Ian Scoones. 1997. "Challenges to Community-Based Sustainable Development: Dynamics, Entitlements, Institutions." *IDS Bulletin* 28 (4): 4–14. doi:10.1111/j.1759-5436.1997.mp28004002.x.
- . 1999. "Environmental Entitlements: Dynamics and Institutions in Community-Based Natural Resource Management." *World Development* 27 (2): 225–47. doi:10.1016/S0305-750X(98)00141-7.
- Lears, Jackson T. 1985. "The Concept of Cultural Hegemony: Problems and Possibilities." *The American Historical Review* 90 (3): 567–93. doi:10.1086/ahr/90.3.567.
- Leeuwis, Cees, Rhiannon Pyburn, and Andre Boon. 2002. "Concluding reflections on social learning: Tadpoles, lily pads and lotus flowers." In *Wheelbarrows full of frogs: Social learning in rural resource management: international research and reflections*, edited by Cees Leeuwis and Rhiannon Pyburn, 449–70. Assen, Netherlands: Koninklijke Van Gorcum.
- Lefort, René. 2007. "Powers – mengist – and peasants in rural Ethiopia: the May 2005 elections." *J. Mod. Afr. Stud.* 45 (02): 253. doi:10.1017/S0022278X07002534.
- . 2010. "Powers – mengist – and peasants in rural Ethiopia: the post-2005 interlude." *J. Mod. Afr. Stud.* 48 (03): 435–60. doi:10.1017/S0022278X10000297.
- . 2012. "Free market economy, 'developmental state' and party-state hegemony in Ethiopia: the case of the 'model farmers'." *J. Mod. Afr. Stud.* 50 (04): 681–706. doi:10.1017/S0022278X12000389.
- Leulseged, Yirgu, Alan Nicol, and Shweta Srinivasan. 2013. "Warming to Change? Climate Policy and Agricultural Development in Ethiopia." Working Paper 071.

- Li, Tanja. 2005. "Beyond "the State" and Failed Schemes." *American Anthropologist* 107 (3): 383–94. doi:10.1525/aa.2005.107.3.383.
- Maarleveld, Marleen, and Constant Dabgbégnon. 1999. *Agriculture and Human Values* 16 (3): 267–80. doi:10.1023/A:1007559903438.
- Mammo, Tirfe. 1999. *The Paradox of Africa's Poverty: The Role of Indigenous Knowledge, Traditional Practices and Local Institutions the Case of Ethiopia*. 1st ed. Lawrenceville, NJ: Red Sea Press.
- Mann, Geoff. 2009. "Should political ecology be Marxist? A case for Gramsci's historical materialism." *Geoforum* 40 (3): 335–44. doi:10.1016/j.geoforum.2008.12.004.
- Mansuri, Ghanzala, and Vijayendra Rao. 2004. "Community-Based and -Driven Development: A Critical Review." *The World Bank Research Observer* 19 (1): 1–39. doi:10.1093/wbro/lkh012.
- Marino, Elizabeth, and Jesse Ribot. 2012. "Special Issue Introduction: Adding insult to injury: Climate change and the inequities of climate intervention." *Global Environmental Change* 22 (2): 323–28. doi:10.1016/j.gloenvcha.2012.03.001.
- McCrum, Gillian, Kirsty Blackstock, Keith Matthews, Mike Rivington, Dave Miller, and Kevin Buchan. 2009. "Adapting to climate change in land management: the role of deliberative workshops in enhancing social learning: The role of deliberative workshops in enhancing social learning." *Env. Pol. Gov.* 19 (6): 413–26. doi:10.1002/eet.525.
- Meinzen Dick, Ruth. 2014. "Property rights and sustainable irrigation: A developing country perspective." *Agricultural Water Management* 145:23–31. doi:10.1016/j.agwat.2014.03.017.
- Meinzen-Dick, Ruth. 2007. "Beyond Panaceas in Water Institutions." *Proceedings of the National Academy of Sciences of the United States of America* 104 (39): 15200–15205. doi:10.1073/pnas.0702296104.
- Mekonnen, Alemu, Mahmud Yesuf, Menale Kassie, and John Pender. 2007. "Cost of Land Degradation in Ethiopia: A Critical Review of Past Studies." *EFD/WB report*. <http://www.efdinitiative.org/publications/cost-land-degradation-ethiopia-critical-review-past-studies>.
- Mezirow, Jack. 1997. "Transformative Learning: Theory to Practice." *New Directions for Adult and Continuing Education* 1997 (74): 5–12. doi:10.1002/ace.7401.
- Miles, Matthew B., and Alan M. Huberman. 1994. *Qualitative Data Analysis: An Expanded Sourcebook*. 2nd ed. Thousand Oaks: SAGE.
- Miller, Peter, and Nikolas Rose. 2006. "Governing economic life." *Economy and Society* 19 (1): 1–31. doi:10.1080/030851490000000001.
- MoA. 2014. "News: The Natural Resource Development and Conservation Directorate Evaluates the 4th year achievements of Growth and Transformation Plan." Accessed October 13, 2015. <http://www.moa.gov.et/documents/93665/2063591>.
- MoA/ATA. 2014. "Realizing the potential of household irrigation in Ethiopia: Vision, systemic challenges and policy interventions." Working Strategy.
- MoARD. 2006. *Agricultural Policies, Programs And Targets for a Plan for Accelerated and Sustainable Development to End Poverty (PASDEP) 2005/6 - 2009/10/*. Addis Ababa.
- . 2010a. *ETHIOPIA'S AGRICULTURAL SECTOR POLICY AND INVESTMENT FRAMEWORK (PIF) 2010-2020*. Final Draft. Addis Ababa.

- . 2010b. “Ethiopia's Agricultural Sector Policy and Investment Framework (PIF) 2010-2020.” Draft Final Report.
- MoFED. 2010. *Growth and Transformation Plan (GTP) 2010/11-2014/15 (Draft)*. Addis Ababa, Ethiopia.
- MoI. 2001. *The Government of the Federal Democratic Republic of Ethiopia Rural Development Policies, Strategies and Instruments*. Addis Ababa, Ethiopia.
- Molle, François, Peter Mollinga, and Philippus Wester. 2009. “Hydraulic bureaucracies and the hydraulic mission: Flows of water, flows of power.” *Water Alternatives* 2 (3): 328–49.
- Mollinga, Peter, and Alex Bolding. 2004. “Chapter 1: Introduction.” In *The politics of irrigation reform: Contested policy formulation and implementation in Asia, Africa, and Latin America*, edited by Peter P. Mollinga and Alex Bolding, 1–10. Global environmental governance series. Aldershot, UK, Burlington, VT: Ashgate.
- Mollinga, Peter P., and Alex Bolding, eds. 2004. *The politics of irrigation reform: Contested policy formulation and implementation in Asia, Africa, and Latin America*. Global environmental governance series. Aldershot, UK, Burlington, VT: Ashgate.
- Mollinga, Peter P., Ruth S. Meinzen-Dick, and Douglas J. Merrey. 2007. “Politics, Plurality and Problemsheds: A Strategic Approach for Reform of Agricultural Water Resources Management.” *Development Policy Review* 25 (6): 699–719. doi:10.1111/j.1467-7679.2007.00393.x.
- Mostert, Erik, Claudia Pahl-Wostl, Yvonne Rees, Brad Searle, David Tàbara, and Joanne Tippett. 2007. “Social Learning in European River-Basin Management: Barriers and Fostering Mechanisms from 10 River Basins.” *E&S* 12 (1). <http://www.ecologyandsociety.org/vol12/iss1/art19/>. Accessed April 15, 2013.
- MoWR. 1999. *Ethiopian Water Resources Management Policy*. Addis Ababa.
- . 2002. *Water Sector Development Program: 2002-2016*. Addis Ababa.
- . 2007. *Kobo-Girana Pressurized Irrigaon System Study and Detailed Desigh Project Volume V: Annex IX: Socioeconomics*. Addis Ababa.
- . 2008. “Kobo-Girana Pressurized Irrigation System Study and Detailed Design Project: Water Resources.” Annex A: Hydrology.
- Müller-Mahn, Detlef, and Jonathan Everts. 2013. “Riskscapes: The Spatial Dimention of Risk.” In *The Spatial Dimension of Risk: How Geography Shapes the Emergence of Riskscapes*, edited by Detlef Müller-Mahn. 1st ed., 22–36. The earthscan risk in society series 27. London: Routledge.
- Nelson, Donald. 2009. “Conclusions: Transforming the world.” In *Adapting to climate change: Thresholds, values, governance*, edited by W. N. Adger, Irene Lorenzoni, and Karen L. O'Brien, 491–500. Cambridge, New York: Cambridge University Press.
- Niang, I., O.C. Ruppel, M.A. Abdrabo, A. Essel, C. Lennard, J. Padgham, and P. Urquhart. 2014. “Africa.” In IPCC 2014, 1199–1265.
- Niang, Isabelle, Oliver Ruppel, Mohamed Abdrabo, Ama Essel, Christopher Lennard, Jonathan Padgham, and Penny Urquhart. 2014. “Africa.” In *Impacts, Adaptation and Vulnerability ; Part B, Regional Aspects: Working Group II Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, edited by IPCC. 1st ed., 1199–1266.

- Noble, Ian, Saleemul Huq, Yuri Anokhin, JoAnn Carmin, and Dieudonne Goudou. 2014. "Adaptation Needs and Options." In IPCC 2014, 833–68.
- November, Valerie. 2008. "Spatiality of risk." *Environ. Plann. A* 40 (7): 1523–27. doi:10.1068/a4194.
- Nyssen, Jan, Mitiku Haile, Jan Moeyersons, Jean Poesen, and Jozef Deckers. 2004. "Environmental policy in Ethiopia: a rejoinder to Keeley and Scoones." *J. Mod. Afr. Stud.* 42 (1): 137–47. doi:10.1017/S0022278X03004518.
- O'Brien, Karen, Eriksen, Siri, Nygaard, Lynn, and A. Schijolden. 2007. "Why different interpretations of vulnerability matter in climate change discourses." *Climate Policy* 7 (1): 73–88. Accessed March 15, 2013.
- O'Brien, K. 2012. "Global environmental change II: From adaptation to deliberate transformation." *Progress in Human Geography* 36 (5): 667–76. doi:10.1177/0309132511425767.
- O'Brien, Karen L., and Johanna Wolf. 2010. "A values-based approach to vulnerability and adaptation to climate change." *WIREs Clim Chang*, n/a. doi:10.1002/wcc.30.
- O'Keefe, Phil, Ken Westgate, and Ben Wisner. 1976. "Taking the naturalness out of natural disasters." *Nature* 260 (5552): 566–67. doi:10.1038/260566a0.
- Olsson, Per, Carl Folke, and Fikret Berkes. 2004. "Adaptive Comanagement for Building Resilience in Social–Ecological Systems." *Environmental Management* 34 (1): 75–90. doi:10.1007/s00267-003-0101-7.
- Oppenheimer, Michael. 2005. "Defining Dangerous Anthropogenic Interference: The Role of Science, the Limits of Science." *Risk Analysis* 25 (6): 1399–1407. doi:10.1111/j.1539-6924.2005.00687.x.
- Ostrom, Elinor. 1992. *Crafting institutions for self-governing irrigation systems*. San Francisco, Calif., Lanham, Md. ICS Press; Distributed to the trade by National Book Network.
- Pahl-Wostl, Claudia. 2006. "Transitions towards adaptive management of water facing climate and global change." *Water Resour Manage* 21 (1): 49–62. doi:10.1007/s11269-006-9040-4.
- . 2009. "A conceptual framework for analysing adaptive capacity and multi-level learning processes in resource governance regimes." *Global Environmental Change* 19: 354–65.
- Pahl-Wostl, Claudia, Marc Craps, Art Dewulf, Erik Mostert, David Tabara, Taillieu, and Tharsi. 2007. "Social Learning and Water Resources Management." *Ecology and Society* 12 (2). <http://www.ecologyandsociety.org/vol12/iss2/art5/>. Accessed April 15, 2013.
- Pahl-Wostl, Claudia, David Tabara, Rene Bouwen, Marc Craps, Art Dewulf, Erik Mostert, Dagmar Ridder, and Tharsi Taillieu. 2008. "The importance of social learning and culture for sustainable water management." *Ecological Economics* 64 (3): 484–95. doi:10.1016/j.ecolecon.2007.08.007.
- Peet, Richard, Paul Robbins, and Michael Watts, eds. 2011. *Global Political Ecology*. 1st ed. London: Routledge.
- Peet, Richard, Paul Robbins, and Michael J. Watts. 2011. "Global Nature." In *Global Political Ecology*, edited by Richard Peet, Paul Robbins, and Michael Watts. 1st ed., 1–48. London: Routledge.
- Peet, Richard, and Michael Watts. 1996. "Liberation Ecology: Development, sustainability, and environment in an age of market triumphalism." In *Liberation ecologies: Environment*,

- development, social movements*, edited by Richard Peet and Michael Watts, 1–45. London, New York: Routledge.
- Pelling, Mark. 2011. *Adaptation to climate change: From resilience to transformation*. London, New York: Routledge. Accessed January 18, 2013.
- Pelling, Mark, Chris High, John Dearing, and Denis Smith. 2008. “Shadow spaces for social learning: a relational understanding of adaptive capacity to climate change within organisations.” *Environ. Plann. A* 40 (4): 867–84. doi:10.1068/a39148.
- Pelling, Mark, Karen O’Brien, and David Matyas. 2015. “Adaptation and transformation.” *Climatic Change* 133 (1): 113–27. doi:10.1007/s10584-014-1303-0.
- Pender, J., and B. Gebremedhin. 2007. “Determinants of Agricultural and Land Management Practices and Impacts on Crop Production and Household Income in the Highlands of Tigray, Ethiopia.” *Journal of African Economies* 17 (3): 395–450. doi:10.1093/jae/ejm028.
- Pendergraft, Curtis A. 1998. “Human Dimensions of Climate Change: Cultural Theory and Collective Action.” *Climatic Change* 39 (4): 643–66. doi:10.1023/A:1005323809980.
- Plummer, Ryan. 2013. “Can Adaptive Comanagement Help to Address the Challenges of Climate Change Adaptation?” *E&S* 18 (4). doi:10.5751/ES-05699-180402.
- Plummer, Ryan, and Julia Baird. 2013. “Adaptive Co-Management for Climate Change Adaptation: Considerations for the Barents Region.” *Sustainability* 5 (2): 629–42. doi:10.3390/su5020629.
- Pratt, A. C. 1995. “Putting critical realism to work: the practical implications for geographical research.” *Progress in Human Geography* 19 (1): 61–74. doi:10.1177/030913259501900104.
- Reed, Mark, S. Evely, Anna, C., Georgina. Cundill, Ioan. Fazey, Jayne. Glass, Adele. Laing, Jens. Newig, Brad Parrish, Prell, Christina, Raymond, Chris, and Stringer, Lindsay, C. 2010. “What is Social Learning?” *Ecology and Society* 15 (4).
- Reij, Chris. 2015. “How Ethiopia Went from Famine Crisis to Green Revolution.” Accessed January 13, 2016. <http://www.wri.org/blog/2015/07/how-ethiopia-went-famine-crisis-green-revolution>.
- Revi, A., D. Satterthwaite, F. Aragon-Durand, J. Corfee-Morlot, R. B. R. Kiunsi, M. Pelling, D. Roberts, W. Solecki, S. P. Gajjar, and A. Sverdluk. 2014. “Towards transformative adaptation in cities: The IPCC's Fifth Assessment.” *Environment and Urbanization* 26 (1): 11–28. doi:10.1177/0956247814523539.
- Ribot, Jesse. 2011. “Vulnerability before adaptation: Toward transformative climate action.” *Global Environmental Change* 21 (4): 1160–62. doi:10.1016/j.gloenvcha.2011.07.008.
- Rist, Stephan, Mani Chidambaranathan, Cesar Escobar, Urs Wiesmann, and Anne Zimmermann. 2007. “Moving from sustainable management to sustainable governance of natural resources: The role of social learning processes in rural India, Bolivia and Mali.” *Journal of Rural Studies* 23 (1): 23–37. doi:10.1016/j.jrurstud.2006.02.006.
- Rist, Stephan, Freddy Delgado, and Burgoa and Wiesmann. 2003. “The Role of Social Learning Processes in the Emergence and Development of Aymara Land Use Systems.” 23 (3): 263–70. doi:10.2307/3674610.
- Rittel, J.W.Horst, and M. M. Webber. 1973. “Dilemmas in a General Theory of Planning.” *Policy Sciences* 4: 155–69. Accessed May 07, 2013.
- Robbins, Paul. 2012. *Political ecology: A critical introduction*. 2nd ed. Critical introductions to geography. Chichester West Sussex, Malden MA: J. Wiley & Sons.

- Robbins, Paul, and Kristina Bishop. 2008. "There and back again: Epiphany, disillusionment, and rediscovery in political ecology." *Geoforum* 39 (2): 747–55. doi:10.1016/j.geoforum.2006.12.013.
- Rodela, Romina. 2011. "Social Learning and Natural Resource Management: The Emergence of Three Research Perspectives." *E&S* 16 (4). doi:10.5751/ES-04554-160430.
- Rose-Redwood, Reuben S. 2006. "Governmentality, geography, and the geo-coded world." *prog hum geogr* 30 (4): 469–86. doi:10.1191/0309132506ph619oa.
- Sarewitz, Daniel. 2004. "How science makes environmental controversies worse." *Environmental Science & Policy* 7 (5): 385–403. doi:10.1016/j.envsci.2004.06.001.
- Sayer, Andrew. 1992. *Method in Social Science: A Realist Approach*. 2nd ed. London: Routledge.
- Sayer, R. A. 2000. *Realism and social science*. London, Thousand Oaks, Calif. SAGE.
- Schusler, Tania, Daniel Decker, and M. Pfeffer. 2003. "Social Learning for Collaborative Natural Resource Management." *Society & Natural Resources* 16 (4): 309–26.
- Scoones, Ian. 2009. "Livelihoods perspectives and rural development." *The Journal of Peasant Studies* 36 (1): 171–96. doi:10.1080/03066150902820503.
- Scott, James C. 1985. *Weapons of the Weak: Everyday Forms of Peasant Resistance*. New Haven: Yale University Press.
- . 1998. *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. The Yale ISPS series. New Haven: Yale Univ. Press.
- Seleshi, Yilma, and Ulrich Zanke. 2004. "Recent changes in rainfall and rainy days in Ethiopia." *Int. J. Climatol.* 24 (8): 973–83. doi:10.1002/joc.1052.
- Sen, Amartya Kumar. 1984. *Poverty and Famines: An Essay on Entitlement and Deprivation*. Oxford: Clarendon Press.
- Smit, Barry, and Mark W. Skinner. 2002. "Adaptation options in agriculture to climate change: a typology." *Mitigation and Adaptation Strategies for Global Change* 7 (1): 85–114. doi:10.1023/A:1015862228270.
- Smit, Barry, and Johanna Wandel. 2006. "Adaptation, adaptive capacity and vulnerability." *Global Environmental Change* 16 (3): 282–92. doi:10.1016/j.gloenvcha.2006.03.008.
- Sum, Ngai-Ling. 2012. "Towards a Cultural Political Economy: Discourses, Material Power and (Counter-)Hegemony." CPERC Working Paper 2012-01. Unpublished manuscript, last modified July 14, 2015.
- Swyngedouw, E. 2010. "Apocalypse Forever? Post-political Populism and the Spectre of Climate Change." *Theory, Culture & Society* 27 (2-3): 213–32. doi:10.1177/0263276409358728.
- Tàbara, David, and Claudia Pahl-Wostl. 2007. "Sustainability Learning in Natural Resource Use and Management." *Ecology and Society* 12 (2).
- Taylor, Marcus. 2014. *The political ecology of climate change adaptation: Livelihoods, agrarian change and the conflicts of development*. Routledge explorations in development studies: Routledge.
- Tesemma, Tesfaye, and Efram Bechere. 1998. "Developing elite durum wheat landrace selections (composites) for Ethiopian peasant farm use: productivity while keeping diversity alive." *Euphytica* 102 (3): 323–28. doi:10.1023/A:1018360432426.

- Tesfaye, Wolde. 2013. "Rural household's poverty and vulnerability in Amhara region: Case study in Gubalafto Woreda." Partial Fulfillment of the Requirements for the Master of Science Degree In Economics, Mekele Universitz. Accessed October 07, 2015.
- Tompkins, Emma L., and Neil W. Adger. 2004. "Does Adaptive Management of Natural Resources Enhance Resilience to Climate Change?" *Ecology and Society* 9(2) 9 (2): 10. <http://www.ecologyandsociety.org/vol9/iss2/art10>. Accessed May 10, 2013.
- Tronvoll, K. 2010. "The Ethiopian 2010 federal and regional elections: Re-establishing the one-party state." *African Affairs* 110 (438): 121–36. doi:10.1093/afraf/adq076.
- Tschakert, Petra, and Kathleen A. Dietrich. 2010. "Anticipatory Learning for Climate Change Adaptation and Resilience." *Ecology and Society* 9(2) 15 (2): 1.
- Turner, B. L., Roger E. Kasperson, Pamela A. Matson, James J. McCarthy, Robert W. Corell, Lindsey Christensen, Noelle Eckley et al. 2003a. "A Framework for Vulnerability Analysis in Sustainability Science." *Proceedings of the National Academy of Sciences of the United States of America* 100 (14): 8074–79. doi:10.1073/pnas.1231335100.
- Turner, BL., P. A. Matson, J. J. McCarthy, R. W. Corell, L. Christensen, N. Eckley, G. K. Hovelsrud-Broda et al. 2003b. "Illustrating the coupled human-environment system for vulnerability analysis: Three case studies." *Proceedings of the National Academy of Sciences* 100 (14): 8080–85. doi:10.1073/pnas.1231334100.
- Turner, M. D. 2014. "Political ecology I: An alliance with resilience?" *Progress in Human Geography* 38 (4): 616–23. doi:10.1177/0309132513502770.
- Uy, Noralene, and Rajib Shaw. 2012. "Overview of Ecosystem-Based Adaptation." In *Ecosystem-Based Adaptation*, edited by Noralene Uy and Rajib Shaw. 1st ed., 3–18. Community, environment and disaster risk management 12. Bingley: Emerald.
- van Steenberg, Frank, Assefa Kumsa, and Nasser Al-Awlaki. 2015a. "Understanding Political Will in Groundwater Management: Comparing Yemen and Ethiopia." *Water Alternatives* 8 (1): 774–99.
- . 2015b. "Understanding Political Will in Groundwater Management: Comparing Yemen and Ethiopia." *Water Alternatives* 8 (1): 774–99.
- Vaughan, Sarah. 2011. "Revolutionary democratic state-building: party, state and people in the EPRDF's Ethiopia." *Journal of Eastern African Studies* 5 (4): 619–40. doi:10.1080/17531055.2011.642520.
- Walker, Peter A. 2006. "Political ecology: where is the policy?" *prog hum geogr* 30 (3): 382–95. doi:10.1191/0309132506ph613pr.
- Walker, Peter A., and PATRICK T. HURLEY. 2004. "Collaboration Derailed: The Politics of "Community-Based" Resource Management in Nevada County." *Society & Natural Resources* 17 (8): 735–51. doi:10.1080/08941920490480723.
- Watts, M. J., and H. G. Bohle. 1993. "The space of vulnerability: the causal structure of hunger and famine." *Progress in Human Geography* 17 (1): 43–67. doi:10.1177/030913259301700103.
- Weisser, Florian, Michael Bollig, Martin Doevenspeck, and Detlef Müller-Mahn. 2014. "Translating the 'adaptation to climate change' paradigm: the politics of a travelling idea in Africa." *The Geographical Journal* 180 (2): 111–19. doi:10.1111/geoj.12037.

- Wenger, E. 2000. "Communities of Practice and Social Learning Systems." *Organization* 7 (2): 225–46. doi:10.1177/135050840072002.
- Wheeler, Tim, and Joachim von Braun. 2013. "Climate Change Impacts on Global Food Security." *Science (New York, N.Y.)* 341 (6145): 508–13. doi:10.1126/science.1239402.
- Wisner, Ben, Piers Blaikie, Terry Cannon, and Ian Davis. 2004. *At risk: Natural hazards, people's vulnerability, and disasters*. 2nd ed. London, New York: Routledge.
- World Bank. 2001a. "Ethiopia - Interim poverty reduction strategy paper (I-PRSP) (2000/01 - 2002/03) and joint assessment." <http://documents.worldbank.org/curated/en/2001/01/1000454/ethiopia-interim-poverty-reduction-strategy-paper-i-prsp-200001-200203-joint-assessment>.
- . 2001b. "Ethiopia Interim Poverty Reduction Strategy Paper 2000/01- 2002/03." Unpublished manuscript, last modified April 23, 2015. <http://documents.worldbank.org/curated/en/2001/01/1000454/ethiopia-interim-poverty-reduction-strategy-paper-i-prsp-200001-200203-joint-assessment>.
- . 2006. "Ethiopia: Managing Water Resources to Maximize Sustainable Growth." A World Bank Water Resources Assistance.
- . 2007. "Stakeholder Assessment of Opportunities and Constraints to Sustainable Land Management in Ethiopia." <https://openknowledge.worldbank.org/handle/10986/7940>.
- Yeung, H.W.C. 1997. "Critical realism and realist research in human geography: a method or a philosophy in search of a method?" *prog hum geogr* 21 (1): 51–74. doi:10.1191/030913297668207944.
- Yilmaz, Serdar, and Varsha Venugopal. 2008. "Local Government Discretion and Accountability in Ethiopia." International Studies Program Working Paper 08-38.

Annexes

Annex I

Documents Reviewed

Code	Document Type	Source
ARABD-1	Annual Plan of Amhara Region Agriculture Bureau, 2013/14	Amhara Region Bureau of Agriculture
ARABD-2	Strategic Plan (2010-2015), Amhara Region Agriculture Bureau	Amhara Region Bureau of Agriculture
ARABD-3	Assessment of natural resource management works through public mobilization in Amhara national regional state, Ethiopia	Amhara Region Bureau of Agriculture
ARABD-4	Monthly feedback 1 from Amhara Region Bureau of Agriculture to Zone Agricultural Offices	Amhara Region Bureau of Agriculture
ARABD-5	Monthly feedback 2 from Amhara Region Bureau of Agriculture to Zone Agricultural Offices	Amhara Region Bureau of Agriculture
ARABD-6	Monthly feedback 3 from Amhara Region Bureau of Agriculture to Zone Agricultural Offices	Amhara Region Bureau of Agriculture
ARABD-7	Monthly feedback 14 from Amhara Region Bureau of Agriculture to Zone Agricultural Offices	Amhara Region Bureau of Agriculture
ARABD-8	Monthly feedback 13 from Amhara Region Bureau of Agriculture to Zone Agricultural Offices	Amhara Region Bureau of Agriculture
ARABD-9	Monthly feedback 12 from Amhara Region Bureau of Agriculture to Zone Agricultural Offices	Amhara Region Bureau of Agriculture
ARABD-10	Monthly feedback 8 from Amhara Region Bureau of Agriculture to Zone Agricultural Offices	Amhara Region Bureau of Agriculture
ARABD-11	Draft model by law of watershed users cooperative	Amhara Region Bureau of Agriculture
NWAOD-1	North Wollo Agriculture Office Annual Plan, 2013/14	North Wollo Agriculture Office
NWAOD-2	Feedback from the Zone Agricultural Office to the Districts, February	North Wollo Agriculture Office
NWAOD-3	North Wollo Agriculture Office Natural Resource Management Report	North Wollo Agriculture Office
NWAOD-4	Feedback from the Zone Agricultural Office to the Districts, Feedback 2	North Wollo Agriculture Office
GDAOD-1	Gubalafto District Agricultural Office Annual Plan, 2013/14	Gubalafto District Agriculture Office
GDAOD-3	Gubalafto District Agricultural Office, Woyniye Village, Korch Watershed Planning Document	Gubalafto District Agriculture Office
GDAOD-4	Gubalafto District Agricultural Office, Woyniye Village, Agdama Watershed Planning Document	Gubalafto District Agriculture Office
GDAOD-5	Gubalafto District Agricultural Office, Laste Gerado Village, Oromo Debiso Watershed Planning Document	Gubalafto District Agriculture Office
GDAOD-6	Gubalafto District Agricultural Office, Laste Gerado Village, Wade Meda	Gubalafto District Agriculture Office

Code	Document Type	Source
	Watershed Planning Document	
GDAOD-7	Gubalafto District Agricultural Office, Laste Gerado Village, Lenche Dima Watershed Planning Document	Gubalafto District Agriculture Office
GDAOD-8	Gubalafto District Agricultural Office, Laste Gerado Village, G-Kebele Watershed Planning Document	Gubalafto District Agriculture Office
KGVDPD-1	Kobo-Girana Pressurized Irrigation System Study and Detail Design Project Volume V: Annex IX, Socio-Economics	Kobo-Girana Valley Development Program, Kobo
KGVDPD-2	Irrigation agronomy study, Kobo-Girana Pressurized Irrigation Project	Kobo-Girana Valley Development Program, Kobo
KGVDPD-3	Kobo-Girana Valley Development Plan, Second Quarter Report, 2011/22	Kobo-Girana Valley Development Program, Kobo
KGVDPD-4	Kobo-Girana Valley Development Plan, Fourth Quarter Report, 2012/23	Kobo-Girana Valley Development Program, Kobo
KGVDPD-5	Kobo-Girana Valley Development Plan, First Quarter Report, 2014/25	Kobo-Girana Valley Development Program, Kobo
KGVDPD-6	Kobo-Girana Valley Development Plan, Third Quarter Report, 2014/25	Kobo-Girana Valley Development Program, Kobo

Annex II

Key Informants Interviews

Code	Interview Type	Interview Date	Duration	Remarks
AR-EPA-KII	Key Informant Interview with Regional Expert	September 5, 2013	1hr	
NWAO-KII	Key Informant Interview with Zonal Agriculture Office Expert	June 15, 2014	1.5hr	
GDAO-KII-1	Key Interview with Gubalafto District Agriculture I Office Expert	February 9, 2014	45 min	
GDAO-KII-2	Key Interview with Gubalafto District Agriculture I Office Expert	February 9, 2014	30 min	
GDAO-KII-3	Key Interview with Gubalafto District Agriculture I Office Expert	February 10 , 2014	1hr	
KGVDP-KII-1	Key Informants Interview with Kobo-Girana Valley Development Program Expert	June 2, 2014	1.5hr	
KGVDP-KII-2	Key Informants Interview with Kobo-Girana Valley Development Program Expert	April 3, 2014	35min	
KGVDP-KII-3	Key Informants Interview with Kobo-Girana Valley Development Program Expert	June 5, 2014	30 min	
KGVDP-KII-4	Key Informants Interview with Kobo-Girana Valley Development Program Expert	June 6, 2014	52 min	
KGVDP-KII-5	Key Informants Interview with Kobo-Girana Valley Development Program Expert	April 7, 2014	36 min	
KGVDP-KII-6	Key Informants Interview with Kobo-Girana Valley Development Program Expert	June 6, 2014	1:05hr	
GDAO-FGD	Gubalafto District Agricultural Office Experts Focus Group Discussion	February 10, 2014	45 min	

Annex III

Individual Interviews

Code	Description	Date	Length	Remark
V1-IIR-1	Individual Interview with a female respondent in Woyniye Village	January 1, 2014	38min	Female
V1-IIR-2	Individual Interview with a respondent in Woyniye Village	January3, 2014	42min	
V1-IIR-3	Individual Interview with a respondent in Woyniye Village	January 3, 2014	42min	
V1-IIR-4	Individual Interview with a respondent in Woyniye Village	January 5, 2014	37min	
V1-IIR-5	Individual Interview with a respondent in Woyniye Village	January 5, 2014	40min	Female
V1-IIR-6	Individual Interview with a respondent in Woyniye Village	January 15, 2014	50min	
V1-IIR-7	Individual Interview with a respondent in Woyniye Village	January 17, 2014	35min	
V1-IIR-8	Individual Interview with a respondent in Woyniye Village	January 17, 2014	1.5hr	
V1-IIR-9	Individual Interview with a respondent in Woyniye Village	July 19, 2013	1hr	
V1-IIR-10	Individual Interview with a respondent in Woyniye Village	July 20, 2013	1hr	
V1-IIR-11	Individual Interview with a respondent in Woyniye Village	July 10, 2013	1.5hr	
V1-IIR-12	Individual Interview with a respondent in Woyniye Village	July15, 2013	30min	Female
V2-IIR-1	Individual Interview with a respondent in Laste Gerado	February 20, 2014	30min	Female
V2-IIR-2	Individual Interview with a respondent in Laste Gerado	February 20, 2014	40min	
V2-IIR-3	Individual Interview with a respondent in Laste Gerado	March 2, 2014	37min	
V2-IIR-4	Individual Interview with a respondent in Laste Gerado	March 2, 2014	46min	
V2-IIR-5	Individual Interview with a respondent in Laste Gerado	March 7, 2014	40min	
V2-IIR-6	Individual Interview with a respondent in Laste Gerado	March 7, 2014	45min	
V2-IIR-7	Individual Interview with a respondent in Laste Gerado	March 10, 2014	40min	
V2-IIR-8	Individual Interview with a respondent in Laste Gerado	March 13, 2014	1hr	
V2-IIR-9	Individual Interview with a respondent in Laste Gerado	March 15, 2014	50min	
V2-IIR-10	Individual Interview with a respondent in Laste Gerado	March 15, 2014	55min	Female
V3-IIR-1	Individual Interview with a respondent in study village 3, Laste Gerado	May 12, 2014	35min	
V3-IIR-2	Individual Interview with a respondent in study village 3, Laste Gerado	May 12, 2014	1hr	
V3-IIR-3	Individual Interview with a respondent in study village 3, Laste Gerado	May 14, 2014	1hr	
V3-IIR-4	Individual Interview with a respondent in study village 3, Laste Gerado	May 14, 2014	1hr	
V3-IIR-5	Individual Interview with a respondent	May 17, 2014		

	in study village 3, Laste Gerado			
V3-IIR-6	Individual Interview with a respondent in study village 3, Laste Gerado	May 17, 2014	33min	
V3-IIR-7	Individual Interview with a respondent in study village 3, Laste Gerado	May 18, 2014	45min	
V3-IIR-8	Individual Interview with a respondent in study village 3, Laste Gerado	May 20, 2014	27min	
V3-IIR-9	Individual Interview with a respondent in study village 3, Laste Gerado	May 20, 2014	35min	
V3-IIR-10	Individual Interview with a respondent in study village 3, Laste Gerado	May 22, 2014	55min	
V4-IIR-1	Individual Interview with a respondent in study village 4, Addis-Kign	April 4, 2014	1.5hr	
V4-IIR-2	Individual Interview with a respondent in study village 4, Addis-Kign	April 4, 2014	1hr	
V4-IIR-3	Individual Interview with a respondent in study village 4, Addis-Kign	April 6, 2014	1.5hr	
v4-IIR-4	Individual Interview with a respondent in study village 4, Addis-Kign	April, 6 2014	1.5hr	
V4-IIR-5	Individual Interview with a respondent in study village 4, Addis-Kign	April 7, 2014	1hr	
V4-IIR-6	Individual Interview with a respondent in study village 4, Addis-Kign	April 10, 2014	1hr	
V4-IIR-7	Individual Interview with a respondent in study village 4, Addis-Kign	April 10, 2014	45min	
V4-IIR-8	Individual Interview with a respondent in study village 4, Addis-Kign	April 15, 2014	2hr	
V4-IIR-9	Individual Interview with a respondent in study village 4, Addis-Kign	April 15, 2014	1hr	
V4-IIR-10	Individual Interview with a respondent in study village 4, Addis-Kign	April 15, 2014	35min	

Annex IV

Focus Group Discussions Conducted

Code	Description	Duration	Remark
GDAO-FGD	Focus Group Discussion with Gubalafto District Agriculture Office Experts	1hr	
KGVDP-FGD	Focus Group Discussion with Kobo-Girana Valley Development Program Experts	1.5hr	
V1-FGD-1	Focus Group Discussion with women Farmers, Village 1, Woyniye	45min	
V1-FGD-2	Focus Group Discussion with Development Team Members, Village 1, Woyniye	45min	
V1-FGD-3	Focus Group Discussion with Development Teams, Village 1, Woyniye	45min	
V2-FGD-1	Focus Group Discussion with Development Team Members, Village 2, residents of Oromo got, Village 2, Laste Gerado	1hr	
V2-FGD-2	Focus Group Discussion with hillside enclosure users, Village 2, Laste Gerado	1hr	
V3-FGD-1	Focus Group Discussion with Hormat Golina Number 31 Cooperative Executive Committee Members, Village 3, Aradom	1.5hr	
V3-FGD-2	Focus Group Discussion with Hormat Golina Number 30 Cooperative Executive Committee Members , Village 3, Aradom	1.5hr	
V3-FGD-3	Focus Group Discussion with Hormat Golina Number 1 Cooperative Executive Committee Members , Village 3, Aradom	1.5hr	
V4-FGD-1	Focus Group Discussion Waja Golisha Number 2 Cooperative Executive Committee Members, Village 4, Addis-Kign	1.5hr	
V4-FGD-2	Focus Group Discussion with Waja Golisha No 12 Cooperative Executive Committee Members ,Village 4, Addis-Kign	1.5hr	
V4-FGD-3	Focus Group Discussion with Waja Golisha 13 Cooperative Executive Committee Members, Village 4, Addis-Kign	1.5hr	

Annex V

Field Observations

Code	Description	Date	Remark
GDAO-Ob	Gubalafto District Agriculture Office Experts Evaluation of Work Performance of 2012/13 and Planning Orientation for 2013/14 September 26-29, 2014	September 26, 29, 2014	Attended the first and the last days
V1-Ob-1	Development Team Leaders Meeting, Village 1, Woyniye		
V1-Ob2	Field note on the opening day of the watershed development work , Village 1, Woyniye		
V1-Ob-3	Attendance and observation of village Militia meeting, , Village 1, Woyniye		
V1-Ob-4	Field note on field bservation note , Village 1, Woyniye	January 16	
V1-Ob-5	Field note on field observation, Village 1, Woyniye	February 2	
V1-Ob-6	Field Observation note	January 14	
V1-Ob-7	Field observation note on a development team working on watershed development campaign, , Village 1, Woyniye		
V1-Ob-8	Field observation note on village Council Meeting	February 3, 2014	
V1-Ob-9	Field note on meeting attendance of Woyniye Village 2012/13 performance evaluation and 2006 plan orientation for Lead Farmers, September 2-7, 2013, , Village 1, Woyniye	September 2-7, 2013	Attended all the three days
V1-Ob-10	Field note on attendance of Woyniye village Council Meeting, August 22, 2013, , Village 1, Woyniye	August 22, 2013	
V1-Ob-11-	Field note on Shall Neighbourhood, Woynine Village 20012/13 performance evaluation and 2013/14 plan orientation September 16-23, 2013, Village 1, Woyniye	September 16, 17	Attended the first two days
V1-Ob-12	Field note on participation in a community activity at Woyniye Village, weeding of Teff farm at a local school		
V1-Ob-13	Field note on a visit to Kolegenda neighborhood, Village 1, Woyniye		
V1-Ob-14	Field note on participation in irrigation users association committee meeting on July 29, 2013, Village 1, Woyniye	July 29, 2013	
V2-Ob-1	Field note on village council meeting, Village 2, Laste-Gerado	March 1, 2014	
V2-Ob-2	Field note on field observation at the watershed development campaign site, , Village 2, Laste-Gerado		
V2-Ob-3	Field note on field observation, Village 2, Laste-Gerado	March 8, 2014	
V2-Ob-4	Field note on field observation at the village irrigation site , Village 2, Laste-Gerado	March 3, 2014	
V2-Ob-4	Field note on field observation at the	February 10,	

Code	Description	Date	Remark
	watershed development campaign site, Village 2, Laste-Gerado	2014	
V2-Ob-6	Field note on field observation at the village watershed development campaign site, Village 2, Laste-Gerado	February 17, 2014	
V2-Ob-7	Field note on field observation, Village 2, Laste-Gerado	February 14	
V2-Ob-8	Field note on field observation at the village watershed development campaign site, Village 2, Laste-Gerado	February 21, 2014	
V2-Ob-9	Field note on field observation while participating in a local school construction, Village 2, Laste-Gerado	February 28,	
V2-Ob-10	Filed note on field observation at a meeting attendance of local enclosure users group meeting	on February 26, 2014	
V2-Ob-11	Field note on field observation on attendance of meeting of village militias, Village 2, Laste-Gerado	February 23, 2014	
V3-Ob-1	Field note on field observation on irrigated farmers of Hormat Number 1 irrigation scheme farmers, Village 3, Aradom	April 25, 2014	
V3-Ob-2	Field note on field observation at a meeting of Hormat Golina Number 1 Irrigation scheme committee members with experts from Kobo-Girana Valley Development Program on fertilizer use, Village 3, Aradom	April 24, 2014	
V3-Ob-3	Field note on field observation, Village 3, Aradom	May 1, 2014	
V4-Ob-1	Field note on field observation, first day in the village, Village 4, Addis Kign	March 26, 2014	
V4-Ob-2	Filed note on field observation, the agronomist interaction with farmers in Waja Golisha number 12 irrigation scheme farmers , Village 4, Addis-Kign	April 13, 2014	
V4-Ob-3	Field note on field observation of farming practice by Waja Golisha number 13 irrigation scheme farmers , Village 4, Addis-Kign	April 8, 2014	
V4-Ob-4	Field observation , Village 4, Addis-Kign		
V4-Ob-5	Field note on observation on Waja Golisha number 13 irrigation scheme committee members financial management discussion with representative from the district cooperative promotion office , Village 4, Addis-Kign	April 14, 2014	
V4-Ob-6	Field note on field observation of the farm of one of my respondents in Waja Golisha number 13 irrigation scheme, Village 4, Addis-Kign	April 17	
V4-Ob-7	Field field note on field observation at a meeting attendance of the Waja Golisha irrigation scheme members meeting , Village 4, Addis-Kign		

Code	Description	Date	Remark
V4-=b-7	Field field note on field observation at a meeting attendance of the Waja Golisha irrigation scheme members meeting, Village 4, Addis-Kign		