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ENTER FOR WATER, ENVIRONMENT AND DEVELOPMENT

ASSESSING COLLABORATION OF LOCAL STAKEHOLDER INSTITUTIONS IN HELPING FARMERS TO ADAPT TO IMATE VARIABILITY IMPACTS: A CASE STUDY IN MEREB LEKE WOREDA, TIGRAY, ETHIOPIA

HESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF DIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE GREE OF MASTER OF ART IN ENVIRONMENT AND DEVELOPMENT

BY: HAGOS MESFIN

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I hereby, as a research advisor, certify that I have read and evaluated this thesis prepared under my guidance by Hagos Mesfin entitle "Assessing collaboration of local stakeholder institutions in helping farmers to adapt to climate variability impacts: a case study in Mereb Leke woreda, Tigray, Ethiopia". I recommend that it be submitted as fulfilling the thesis requirement.

Yohannes Abera (PhD)	----------	12/7/2013
Advisor	Signature	Date

As member of the Examining Board of the final defense of the thesis, we certify that we have read and evaluated the thesis. We recommend that it be accepted as fulfilling the requirement for the degree of Master of Arts in Environment and Development.

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Chairperson	Signature	Date
Abdulhamid Bedri	----------	02/07/2013
Internal Examiner	Signature	Date
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External Examiner	Signature	Date

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ABSTRACT

Ethiopia, a county characterized by climate sensitive economy, where the agricultural sector has the largest GDP share and the GDP rises and falls about a year following the changes in average rainfall, in general; the potentially devastating impacts of climate variability on livelihoods and economies in Ethiopia make adaptation to these adverse impacts, a top priority for the country. Institutionally, adding to the existing public and private institutions, the country has a long history of religious and civil society organizations, including local savings groups, mutual self-help groups and regional development associations. Hence, it is important to understand the extent to which these stakeholder institutions are collaboratively involved in enhancing adaptation activities at the grass root level. The study uses *Mereb Leke woreda* (one of the drought prone *woredas* in Tigray) as a case study, and examines the collaboration of local stakeholder institutions over improving the ability of farmers to adapt to climate variability impacts; and assesses if there are particular constraints which limit the collaboration of local stakeholder institutions in local adaptation practices. The study is based on interviews with key informants; FGDs with farmers; semi-structured interviews with leaders and staffs of key stakeholder institutions, along with review of documents from relevant institutions. Many representatives of the *woreda* level governmental offices and agencies; NGO's; *tabia* level government institutions; informal community institutions including religious institutions and local savings groups were interviewed. The study concludes that strong collaborative experiences and culture amongst the local stakeholder institutions, with the required skills and trust has not yet been developed. Lack of finance, lack of skills and capacities, top-down administrative culture, rapid staff turnover, and lack of facilitator and clear regulation on collaboration has been found as major constraints to institutional collaboration in the *woreda.*

Key words and phrases: *Collaboration, Stakeholder institutions, Climate variability impacts, and Local adaptation measures*

LIST OF ABBREVIATIONS AND ACRONYMS

ARDO	Agricultural and Rural Development Office
CRGE	Climate-Resilient Green Economy
CSA	Central Statistics Authority
CSO	Civil Society Organization
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GTP	Growth and Transformation Plan
IISD	International Institute of Sustainable development
IPCC	Intergovernmental Panel on Climate Change
NAPA	National Adaptation Program of Action
NGO	Non-Governmental Organization
NMA	National Metrological Agency
NRST	National Regional State of Tigray
PSNP	Productive Safety Net Program
REST	Relief Society of Tigray
SWC	Soil and Water Conservations
TPLF	Tigrean People Liberation Front
UNDP	United Nations Development Programs
UNFCC	United Nations Frameworks on Climate Change
USAID	United States Aid for International Development
WB	World Bank
WFP	World Food Program
WUA	Water Users Association
WUC	Water Users Committee

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Over the past few decades, climate change has been described by scholars and politicians as a threat unprecedented in human experience. A statement by Tol, (2002, p.1), *"we all know that the world faces a threat potentially more catastrophic than any other threat in human history: climate change and global warming"* could be a representative of such concerns. Consequently, there have been two types of responses to these changes. One, efforts undertaking to reduce the extent to which the climate is altered. In climate change terminology, tackling the change by limiting greenhouse gas emissions is known as mitigation. The second is, to learn how to live with the inevitable changes, and this is known as adaptation to climate change impacts (Reid, 2004). While mitigation is important and should be addressed, it has become increasingly apparent that countries will need to develop a thorough and successful adaptation strategies if the impacts of climate variability are to be effectively addressed (IPCC, 2007; UNFCC, 2007).

Adaptation strategies to climate variability impacts can be considered successful if there is active collaboration of local stakeholder institutions, building up their capacities, and empowering them as active participants in decision making processes for efficient and effective adaptation measures (UNDP, 2005). The complexity and scale of challenge that climate variability poses calls for collaboration, knowledge sharing, pooled and coordinated efforts of all stakeholders, across sectors and across levels beginning from the household and local community to ensure effective adaptation. This is because the effects of climate change are experienced locally, and thus, local stakeholder institutions are best suited to address it (Agrawal, 2008).

Collaboration of stakeholder institutions is viewed as a catalyst for change in the development of adaptive capacity. It even starts to be understood by big international institutions as a means to address multi-dimensional problems in an integrated fashion. For instance, the 2000-2015 strategic framework of the Food and Agriculture Organization (FAO) underscored that institutions must coordinate with others in order to ensure

excellence. It states: *"... with the presence of many institutions working in areas touching on FAO's mandate, the Organization runs with the risk of not being seen as the unique source of information, advice and assistance, and hence not always being perceived as the most authoritative."* Others, including USAID and the World Bank are also making commitments to work in partnerships with a range of stakeholders (FAO, 1999).

Strengthening this notion, recent studies have shown that poor countries in particular, have to rely on local stakeholder institutions and foster their collaboration for the effective way of adapting to changing climate conditions (Agrawal et al., 2009; Adger et al., 2007). Ethiopia, a county characterized by climate sensitive economy, where the agricultural sector has the largest GDP share and the GDP rises and falls about a year following changes in average rainfall (WB, 2006), in general; the potentially devastating impacts of climate variability on livelihoods and economies in Ethiopia make adaptation to these adverse impacts, a top priority for the country (NMA, 2007). Institutionally, adding to the existing public institutions, the country has a long history of religious and civil society organizations (CSOs), including local savings groups, mutual self-help groups and regional development associations (Berhanu, 2002). Moreover, since a devastating famine in 1972-73 and 1984-85, the number of international non-governmental organizations (INGOs) has increased in the country (Lautze et al., 2009). Hence, an important question that has to be answered in this regard is, to what extent these stakeholder institutions are collaboratively helping farmers to adapt to climate variability impacts.

Most of the climate studies have focused either on impacts of climate variability on livelihoods; or on vulnerability of communities to climate shocks; or on coping and adaptation strategies people used (Abate, 2009; Deressa et al., 2008). This study is therefore, aimed at assessing the extent to which the various stakeholder institutions are collaboratively helping farmers for adaptation to climate variability impacts at grass root level in one of the *woredas* in Tigray region, where the region, according to Deressa et al. (2008), is among the most vulnerable regions in Ethiopia.

1.2 Statement of the Problem

Problems resulting from climate variability, particularly drought, have been routine occurrence in Tigray region since ancient times. The most serious drought years often remembered are 1953, 1958, 1977, 1984, 1987, and 1997 (NRST, 1998). This trend still continues and considerable population is exposed to acute food shortages due to delay and insufficient rainfall. The most affected are rural households whose livelihood is heavily dependent on traditional rain fed agriculture. One study on the subject indicated that 80% of the households didn't have enough food to support themselves in the 12 drought prone *woredas* in Tigray (REST, 2008). *Mereb Leke* is one of 12 *woredas* where the study was conducted.

In the recent years, the rainfall amount and pattern of the *woreda* is changing for worse. The rainy season is shortening from time to time, narrowing down to early July to mid or late August. This is unlike in the most of the previous times when it was starting in early June and stopping in early September. This longer dry season accompanied by shortage of feed sources results in death and reduction of livestock production, food shortage, and other socio economic crises. Apparently, rainfall failure in one year has residual impacts in subsequent years indicating that farmers can have food shortage even in the years with sufficient rainfall. A good example is, in the summer 2011, when the rainfall is considered to be sufficient, not more than 20% of the farmers were self-supporting (ARDO of the *woreda,* 2012). Rainfall interruption is another challenge for the farmers. Even if the rain starts early and the farmers begin to plant their crops, it stops for weeks, then, it begins to rain in a certain interval just after the crops have already been lost.

Currently, it has become a common fact that adaptation to climate variability impacts is only effective if a wide and diverse range of stakeholder institutions, social groups and communities are engaged collaboratively in to the process of implementing actions. This is especially true in *Mereb Leke woreda* where the threat of climate variability has been aggravated by problems such as land fragmentation, landlessness, soil erosion, deforestation, inflation, difficulties of transportation due to rugged terrains, limited off-farm income, and at large, limited capacities to adapt. Furthermore, the tension with Eritrea adds more burdens to the people of *Mereb Leke,* particularly those living around the boarder, in a

sense that, stable peace and other socio economic opportunities have been lost since the conflict 1998. Working independently, a bureau, an organization or any other stakeholder institution cannot alone respond adequately to these multiple pressures exacerbated the threats of climate variability. Hence, the study is intended to assess whether and how collaboration the local stakeholder institutions are. It attempts to answer the following two basic questions.

1. How is the collaboration of local stakeholder institutions in helping farmers to adapt to climate variability impacts in *Mereb Leke woreda*?
2. Are there challenges which limit the collaboration of local stakeholder institutions in local adaptation practices in *Mereb Leke woreda*?

1.3 Objectives of the Study

The general objective of the study is to assess the collaboration amongst local stakeholder institutions in helping farmers to adapt to climate variability impacts in *Mereb Leke woreda*. Specifically, the study attempts to:

- Examine collaboration of local stakeholder institutions in improving the ability of farmers to adapt to climate variability impacts in *Mereb Leke woreda*.
- Assess whether there are particular challenges which limit the collaboration of local stakeholder institutions in local adaptation practices in the study area.

1.4 Significance of the Study

The existence of a variety of institutions, and the climate sensitive economy of Ethiopia demands an apparent research to understand the extent to which these institutions are collaboratively working in enhancing the ability of farmers to adapt to climate variability impacts, and improve their economy. Researches such as Berhanu (2002) complained that no research has been undertaken on this particular concept. This research can therefore contribute to the area in a number of ways: first, highlighting issues that need to be taken into account by institutions such as public sector institutions, NGO's and other concerned bodies. Second, by identifying entry points that bring increased performance through collaborative working. Finally, suggesting some areas where further action is required.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

Today, climate change is no longer treated as an environmental issue alone; rather a major development agenda. This trend calls for action not only to try to slow down the process by reducing the effects of human activity on the global climate (mitigation) but also to learn how to live with the threat or to assist those affected or threatened to cope with the changes taking place (adaptation). The latter is much broader concept which encompasses adjustments in ecological, social or economic systems in response to actual or expected climatic stimuli and their effects or impacts (IPCC, 2007). An important question in this regard is how can this be realized (i.e., how farmers can adjust their ecological, social and economic systems and adapt to climate variability)? The answer for this question could lay in the way local stakeholder institutions are collaboratively working in response to climate variability impacts.

Before directly dealing with local stakeholders' role in enhancing adaptation to climate variability, first it is better to discuss some issues about climate variability, and adaptation to climate variability impacts. The Intergovernmental Panel on Climate Change (IPCC) (2007) defines Climate variability as *"the variations in the mean state and other statistics (such as standard deviations, the occurrence of extremes, etc.) of the climate on all temporal and spatial scales beyond that of individual weather events".*

Current estimations indicate that the greatest losses due to climate variability are likely to be in Africa, particularly sub-Saharan Africa (Adger et al, 2007). The occurrence of a single climate disaster in the region such as drought or flood is capable of stagnating or even reversing the economic growth achieved over a decade or so. In the arid, semiarid and dry sub-humid regions of Africa the situation is further complicated by increasing desertification. The poorest and already most food-insecure continent is expected to suffer the most serious contraction in agricultural incomes, estimated to range from two to eight percent of the agricultural GDP (IGAD, 2007 cited in Adger et al, 2007). These clear evidences of losses resulted from climate variability demand efforts of governments,

development agencies and other concerned bodies not only to play an important role in advocating for cuts in greenhouse gas emissions, attention must also focus on how society can adapt in a changing climate. For poor rural communities in particular, it is critically important to learn how to live with the existing and expected threats and assist those affected or threatened to adapt with the changes taking place.

As noted above, the IPCC defines adaptation as *"adjustment in ecological, social or economic systems in response to actual or expected climatic stimuli and their effects or impacts"*. It includes practices, or structures to moderate or offset potential damages or to take advantage of opportunities associated with changes in climate. Historically, adaptation was not central issue across climate discussions. As indicated in Schipper (2006), throughout the 1990s, adaptation was usually taken as a given: *"those who will have to adapt, will adapt"*. Meaning that, capacity to adapt was considered something inherent in ecosystems and society, therefore, not requiring explicit policy.

In the early 2000s, however, adaptation became widespread knowledge. The climatic changes people are dealing with become beyond normal climatic variability. Then, stakeholders involved in a debate started to wonder if ecosystems and local people could really do the job alone. Considering the strong intensity and high speed with which climate changes take place, they came with the notion that specific efforts towards adaptation were required (IISD and IIED, 2007). From then onwards, initiatives started to emerge at the international level, mainly at the international/national policy level, but not without difficulties.

The IISD and IIED (2007) highlighted that initiatives are attempting to define their own approaches and methodology. Hence, in developing these frameworks, there is a clear danger that a classic top-down approach emerges in which adaptation measures are equated with large-scale infrastructure-based interventions associated with physical protection. There is no doubt that large investments in infrastructure are an essential part of the adaptation process, but they add that more focus is needed on non-structural alternatives. They pointed out that bottom-up approach that are rooted in existing community-based patterns of resource management, which aim at sustaining and enhancing the livelihoods of vulnerable people, have to be sufficiently recognized. They further pointed out that grass root initiatives

should be the point of departure for the identification and assessment of adaptation strategies, as they are cheaper, more sustainable and in many cases, more effective in achieving the core goal of assisting poor communities to adapt to the impacts of climate change. Macro policies are meaningful only when accompanied by local, micro-level initiatives that help them to innovate and adapt to the challenges posed by the changing climate (Ibid). Hence, while climate variability is locally experienced, adaptation measures can only be effectively addressed by involving local stakeholder institutions.

2.2 Local Adaptation Measures and the Need for Local Stakeholder Institutions

In many literatures local adaptation responses to climate variability has been classified into five categories, namely; mobility, storage, diversification, communal pooling and market exchange (Agrewal, 2008; Agrewal et al., 2009; Adger et al, 2009). Mobility denotes movements of various types in response to risks and scarcities. It is a common adaptation strategy used by households and communities, particularly in drier parts of the world. Strategies include; agro pastoral migration, wage labor migration, involuntary migration, remittances etc. The second one, storage, is an effective measure against future livelihood failures. Agricultural households, especially in dry areas, can create indigenous storage infrastructure for seeds and harvested crops and can develop time-tested procedures for drying fruits and meats for storage. Water storage, food storage (crops, seeds and forest products), animal/live storage and pest control are specific examples of storage.

Diversification, the third one, can occur in relation to on and off farm employment opportunities, productive and non-productive assets and consumption strategies. Scattering of fields in areas where rainfall is unreliable, diversification into different farm management practices and crop cultivars, and using a combination of occupations such as wage labor, animal rearing, and farming are common diversification responses in risky environments. Strategies such as asset diversification, skills and occupational training, occupational diversification, crop choices, production technologies, consumption choice and etc. are included.

The next, communal pooling refers to adaptation responses involving joint ownership and sharing of wealth, labor, or incomes across households, or mobilization of resources held collectively during times of scarcity. Communities in dry land areas, for example, increase water rationing and/or often prohibit the consumption of certain foods and forest products during times of famine or long-term rainfall failure. Examples include forestry, infrastructure development, information gathering, disaster preparation etc.

The last one, market exchange, is described in Agrewal (2008) as the most versatile mechanism for adaptation. Adaptation to be fair and effective, it requires well developed markets, exchange instruments, and widespread access. Weather-related insurance schemes for agricultural populations are an example of market-based adaptation to climate change. Others include improved market access, new product sales, seeds, animal, and other input purchases and remittances.

The success of these all adaptation practices depends on the specific institutional arrangements of a community. Although households and communities have historically adapted to climate variability through many different strategies, their capacity to adapt depends in significant measures on the ways local stakeholder institutions regulate and structure their interactions (Agrewal, 2008). The institutional rules and behavioral norms, which govern individual responses to hazards, influence adaptive capacity to a large extent and the role of inadequate institutional support is frequently cited across literatures as a hindrance to adaptation (Ostrom, 1990; Agrewal, 2008). This is because of, first, institutions hold societies together, giving sense and purpose and enabling them to adapt (Ostrom, 1990). Second, they regulate the access to adaptation resources, those that ensure equitable opportunities for access to resources promote adaptive capacity within communities and other local entities (Adger et al, 2007). Third, as purveyors of the rules of the game mediate the socially differential command over livelihood assets, thus determining protection or loss of entitlements (Dulal et al. 2010). Indeed, they not only facilitate management of contemporary climate-related risks but also provide an institutional capacity to help deal with risks associated with future climate change.

Agrwal (2008) in his part indicated three critical ways and examples in which local institutions influence adaptation and climate vulnerability. First, local institutions shape the impact of climate change on communities. Elaborating this concept, the same climate phenomenon could have very different effects on the livelihoods of residents in a region, depending on the nature of local governance and local institutional arrangements. For example, reduced precipitation in a region will have a less negative impact on farmers who have access to irrigation versus those who rely on rain-fed agriculture. The negative effect of crop failure is likely to be reduced if farmers have more equitable access to livelihoods related institutions governing distribution of benefits from communal forests or pastures coupled with transparent communication, as opposed to where institutional access is stratified and information is monopolized by a small group.

Second, local institutions shape the way communities respond to climate change. Institutions link individuals with collectives and provide the framework within which households and collectives choose adaptation practices. For example, strong institutional norms around labor sharing will reduce the ability of households to adapt by migrating or diversifying. Social groups that do not have secure rights to land will find it more difficult to diversify asset portfolios or engage in exchange. Closely knit social networks make it easier to undertake communal pooling of resources. Communities that lack access to capital and infrastructure may be unable to use storage or exchange to cope with environmental risks. Without access to markets, communities may be forced to adopt storage of harvests as an adaptation response and invest resources into storage infrastructure.

Third, he noted that local institutions are the intermediaries for external support to adaptation. "*They are the media through which external interventions reinforce or undermine existing adaptation practices*"p.27. Indeed, all external interventions, to be effective, need local institutional arrangements to leverage the impact of interventions. Willing involvement of local institutional partners greatly strengthens the effectiveness of external interventions.

2.2.1 Who are the Local Stakeholder Institutions?

In examining the role of local stakeholder institutions in facilitating adaptation, Agrawal et al (2009) identified three types of institutions: public, civic, and private, in their formal and informal form:

1. **Local public Institutions**

Local government bodies such as elected village councils and intermediate governing bodies, being close to the people and their constituent stakeholders, can help to address the impact of climate variability on local communities. They by their very nature and function can make a powerful and unique contribution to this task as they can draw upon a vast base of purpose and cause-driven local constituencies and stakeholders. In rural areas, for instance, the effects of drought on some farm households can be mitigated where strong equitable water sharing institutional arrangements exist. Similarly, social enclosure of spaces to be reforested or regulation of access to watershed services as an adaptive measure can be best enforced and sustainably managed by representative local government bodies.

2. **Civil society Institutions**

Similar to local public institutions, civil society institutions can act as interlocutors between national level agencies and policy makers on the one hand, and their regional and local constituencies on the other. While mediating and implementing national policies and regulations (and providing feedback on their effectiveness), they also raise public awareness, undertake policy-making, regulatory, and planning functions in sectors that are key to adaptation (such as social inclusion and protection, disaster risk reduction, natural resource management) as well as mobilize community and private resources. This is because they are entities that local people can identify with, are readily accessed, and are easier for their constituencies to hold accountable than a far-away national entity. As cited in Agrewal et al (2009) review of 118 cases of adaptation in 46 countries in the UNFCCC database on adaptation showed that most local civil society institutions involved in climate adaptation tend to be informal institutions. Examples of informal institutions are those around labor sharing, indigenous information exchanges, savings societies, commons institutions, and indigenous knowledge institutions around migration and storage

3. Private Institutions

Private institutions include service organizations such as NGOs and charities, private businesses that provide insurance or loans are also critical to adaptation. The table indicated below summarizes the types of local institutions and their role in adaptation to climate variability impacts.

Table 2.1 A proposed typology of local institutions and their role in local adaptation measures

Types of Institutions	**Public (government)**	**Private (market)**	**Civic (community)**
	Local agencies Local governments	Service organizations Private businesses	Memberships, Organizations, Cooperatives
The role of each the institutions in local adaptation measures	They are more likely to facilitate adaptation strategies related to communal pooling, diversification, and storage owing to their command over authoritative action, and ability to channel technical and financial inputs into rural areas.	Because of their access to financial resources, they are more likely to have greater expertise in promoting market exchange and diversification, but may also be able to advance communal pooling if one takes into account not-for-profit service organizations.	They can strengthen different adaptation responses as a result of their greater flexibility in redefining goals and adopting new procedures.

Source: Agrewal et al, (2009) p.24

The phrase local stakeholder institutions in this thesis, is used to encompass these public, private and community institutions found in *Mereb Leke woreda*. Relevant formal and informal institutions; governmental offices, non-governmental organizations, private organizations, traditional saving and credit groups, religious institutions, and other community institutions tend to be local stakeholder institutions and hence, the study's focus.

It is worth pointing out that in many contexts, formal local institutions and organizations have to work in a way that promote informal processes, as they are critical to adaptation (Ibid). Further, although the analytical distinctions among these different types of institutions are important to bear in mind, in their functioning they often enter into partner relationships, promoting cross-domain collaborations.

2.3 Collaboration of Local Stakeholder Institutions

2.3.1 The Concept and Definition of Collaboration

One of the problems in studying institutional collaboration is, understanding the variety of terms used to identify relationships. Three relationship processes are identified in the literature on institutional relationships: cooperation, coordination, and collaboration. In practice the term collaboration is commonly interchanged with cooperation and coordination. For instance, a dictionary definition of collaboration is cooperating, coordinating, or working in conjunction with others. It is generally understood vaguely as meaning to work together to produce something. Each word, however, carries a different meaning and exhibits a different level of formality and structure (Mattessich et al., 2001; Hord, 1986).

Cooperation refers to a simple verbal agreement between institutions to take some kind of unified action to make their autonomous programs more successful (Hord, 1986). Each cooperating institution remains totally independent, takes no risk, and retains total authority (Mattessich et al., 2001). Cooperation, therefore, is the most informal inter-organizational relationship lacking any common mission, structure or joint planning (Mattessich et al., 2001).

Coordination is slightly more formal than cooperation because the coordinating parties determine that their individual missions are compatible and that they can work together to advance their separate, yet compatible, missions (Mattessich et al.; Hord, 1986). Coordination involves a low level of joint planning, sharing of resources, defining of compatible roles, and interdependent communication channels (Mattessich et al., 2001). Some risk is experienced as the parties coordinate efforts that may or may not be successful for both parties (Mattessich et al., 2001). Each organization retains their autonomy and individual authority (Mattessich et al., 2001).

Collaboration is the most formal institutional relationship involving shared authority and responsibility for planning, implementation, and evaluation of a joint effort (Hord, 1986). In their literature on successful collaboration, Mattessich et al. (2001) define collaboration as "*...a mutually beneficial and well-defined relationship entered into by two or more organizations to achieve common goals*" (p. 39). It brings autonomous organizations together to fulfill a common mission that requires comprehensive planning and communication on many levels (Mattessich et al., 2001). In addition, the risk to each collaborating organization is greater because each member contributes its own resources and reputation (Mattessich et al., 2001). Gray (1989) define collaboration as a process that "*...occurs when a group of autonomous stakeholders of a problem domain engage in an interactive process, using shared rules, norms, and structures, to act or decide on issues related to that domain*" (p. 146). It is increasingly recognized that collaboration should not mean sub-contracting, but a genuine partnership between organizations based on mutual respect, and acceptance of the independence of the collaborating organizations concerning their vision and approaches.

2.3.2 Assessing Institutional Collaboration

Six categories were used as a framework for measuring successful institutional collaboration in their research in Mattessich et al. (2001). It has been noted that these six collaboration factor categories are synthesized from various literatures; and they are most likely to impact the success of institutional collaborations.

1. Trust and partner compatibility;
2. Common and unique purpose;
3. Shared governance and joint decision making;
4. Clear understanding of roles and responsibilities;
5. Open and frequent communication; and
6. Adequate financial and human resources

These six collaboration success factor categories fall in to three stages of collaboration identified in Gray's (1989) seminal work on collaboration. These three stages of collaboration include: (1) the precondition stage where collaborators come together to form the relationship; (2) the process stage where collaborators interact and make decisions; and

(3) the outcomes stage where collaborators assess the effectiveness of their efforts and adapt to change (Gray, 1989).

During the precondition stage, the parties come together to begin the partnership. Collaboration success factors found in the literature that relate to the formation stages fall into the precondition state. These factors include: determining the reasons for partnering, reviewing partner compatibility, defining the criteria for partner selection, and developing a common purpose, goals and objectives. Relationship factors are most critical at this stage with trust being the major relationship factor. Finally, sufficient human resources must be allocated before moving to the process stage (Mattessich et al 2001).

At the process stage partners must clearly identify their roles and responsibilities, create joint decision-making and governance processes, set up methods for open and frequent communications, and select a skilled convener (Mattessich et al 2001). Fostering interdependence at this stage is critical. Installing shared governance or a joint decision-making process at this stage fosters interdependence. Joint decision making provides ownership of the collaboration by bringing partners together to develop plans to carry out the partnership agreement and identify organizational or systems changes that are needed to meet the goals of the partnership (Kanter, 1994). At the same time, the group must remain open to a variety of ways to organize to accomplish tasks and adjust the process if it is not moving the collaboration toward the goal. Commitment of sufficient human resources also fosters interdependence during the process stage. Partners must assign key people interested in the success of the collaboration to lead the project (Mattessich & Monsey, 1992). Finally, a formative evaluation should be completed at this stage (Gray & Wood, 1991).

At the outcomes stage, collaboration success is measured by assessing whether the expected outcomes defined at the precondition stage were met. The accuracy of the identified problem domain should also be assessed to determine if the needs of the target group were met and how effectively these needs were addressed. If additional needs or problems were identified, how these needs can be addressed must be evaluated. Summative program evaluation methods should be implemented at this stage to include whether and how the

collaboration itself may have been transformed during the process stage (Gray & Wood, 1991). Summative evaluation feedback loops should be established to determine whether the collaboration should continue, be restructured, or ended.

2.3.3 Themes in Institutional Collaboration

Much of the literature on collaboration identifies typical themes in institutional collaboration such as diversity, coordination and decision making, information flow and exchange, shared understanding, and trust and support (Rodríguez et al., 2003; Guimera et al., 2005; Engeström et al., 1995).

1. Diversity

Diversity is integral to collaboration amongst institutions. This is because participants in institutional collaboration are often from different histories, experiences, practices and perspectives. There are contradictory views on the impact that diversity has on the effectiveness of the collaboration.

On the one hand, differences amongst institutions is said to increase difficulties in the interaction amongst. For example, conflict may face in addressing different organizational and administrative practices, and the interpretation and response to strategic problems (Rodríguez et al., 2003). Others on the other hand pointed that, differences across institutions is considered valuable as experience across organizations exposes the actor to a variety of operational methods, values and cultures (Guimera et al., 2005). Experience in working with others develops skills in working with diversity such as developing civic responsibility, of listening to different perspectives and participating effectively. This provides skills of cooperation as well as a sense of shared responsibility for collective endeavors with diverse goals and members (Engeström et al., 1995).

2. Coordination and Decision Making

Coordination is necessary for decision making in collaborative arrangements. As stated in Engestrom et al. (1995), coordination is more than networks of common interest in collaborative activity. It involves multiple subjects from different institutions or activity systems; that collaboration meets a need or motive; and that subjects or individuals from different activity systems come together to coordinate care across different institutions

within a system. O'Neil Chung and Brown (1997) stated that the more coordinated a group or team is, the better the decision-making processes and vice versa.

3. Information Flow and Knowledge Creation

It is already identified that coordination is critical to enable information exchange and sharing. It is just one aspect of information flow and knowledge creation, i.e. the meaning and interpretation given to information, influence what information is passed on, how it is passed on, and what knowledge may be created as a result (Gulati, 1999). Therefore, information flow and knowledge creation are important features of collaborative activity, influenced amongst other things by the distribution of power and the goals of each organization taking part. Knowledge creation is a dynamic process of interpretation, a discourse, a tool of power and control. Factors that assist information flow and knowledge creation in an area include the number of institutions and the extent of interaction between them (Ibid)

4. Shared Understandings

Common or shared understandings can include shared mental models (a conception of a system), common language and concepts, common problem-posing and problem-solving heuristics, a group's culture in which there are commonly held values, beliefs and goals (Lorenz, 1992). A range of strategies required to develop shared understanding include behaviors such as: asking relevant and thought-provoking questions, sharing observations, seeking alternative perspectives, assertively challenging a particular opinion, seeking clarification and sharing information through processes of consulting and collaborating (Owen, 2001).

The common concept across different literatures is that collaboration involves shared purposes. For example, firms work together in order to meet their need, to be innovative, competitive, and profitable (Lorenz, 1992). Through collaboration, they reduce uncertainties, increase opportunities for internationalization, expand their range of expertise, and develop specialist products, achieving a range of corporate objectives.

5. Trust and Support

Trust assists good information flow, open dialogue, facilitating collaboration and innovation and quick decision making. In discussing trust within industrial districts, Lorenz (1992) suggests that the beliefs of those involved are important. He argues that although norms of tradeoff may develop and are evident within many industrial districts, the maintenance of mutuality is dependent on the beliefs of actors. For instance, the belief that there is a gain to be made for the actors. Over time common bonds and social identities are shared and there is a developing trust and an exchange of reciprocal services. Trust, good information flow and open dialogue, formal or informal, facilitate collaboration and potentially innovative outcomes. Trust is important in enabling members of a network to make quick decisions and process more complex information (Lorenz, 1992).

In the social capital literature trust is typically described as the lubricant for diverse groups to work together (Flora, 1998). Actors need to trust each other to offer exchanges of information, to develop norms of reciprocity and an ability to listen to different perspectives in order to participate effectively.

To summarize up on all the features, collaborative activity involves working across different practices and histories; it is a process of working at the boundary which is a site of tension and potential learning. Shared understanding in this site is achieved through the development of boundary tools through which dialogue, story-telling, knowledge construction, argumentation and differentiation take place. Experience in diverse collaborative activity increases skills of collaboration, the diversity of networks, access to resources and perspectives not otherwise available. Coordination and decision making requires good communication skills, and the interpreting and exchange of information. These processes are assisted by trust and informal arrangements for exchange. Interpretation of information is influenced by the goals of each participant or organization taking part in the collaboration, and by the asymmetrical distribution of power. Information exchange is core to the development of shared understandings and the development of mental models, just as shared purpose is intrinsic to collective activity. These in turn require trust and support.

2.3.4 Factors Contributing to Institutional Collaboration

It has been distinguished in Guimera et al. (2005) that there are two sets of factors that contribute to institutions' collaborative efforts to address societal problems through an integrated approach.

1. Strategic Factors

The first set of factors relates to conditions that create an environment, promotes an interest, in working collaboratively. They are generally external to partner institutions, which tend to support the strategic interests of the partners. It includes international policy statements, donor interests and national governments' decisions.

International conventions and policy statements on issues that are crosscutting in nature, such as climate change, are highly influential in creating an environment for institutional collaboration. National governments' participation in international conferences and their commitment to those conventions and policies create an opportunity for institutions to commit their own resources to realizing commitments on institutional collaborations. Governments can also be motivated by the commitments they make as signatories of international conventions. Thus, policy statements create an environment in which institutions are driven to collaborate to ensure compliance with these policies and conventions.

Similarly, donor agencies can have significant influence on institutions' interests and motivations to address development issues collaboratively. Decentralized government, further, creates the opportunity to bring stakeholders together as it brought decision-making to the administrative level closest to local communities and the partners that work with them. It may encourage decisions that are responsive to community articulated input and needs, and promote integrated, multi-sectoral actions.

2. Practical Factors

The second are factors that are driven by practical needs which make collaborations work. These factors tend to be internally driven and respond to practical needs. They are critically important as partners will rarely join with others if they do perceive some net gain or benefit for themselves. Benefits may be practical in nature, such as access to resources that enable

them to be more effective, efficient, or build on their successes. They may yield tangible benefits such as new materials and equipment, or improved staff performance resulting from the transfer of knowledge or skills.

Other partnerships are driven by the desire to build on successful lessons by scaling up or replication. Partnerships that yield successes on a small scale, that is, within a limited number of communities, might want to expand the range of those successes by adding new communities. Successful achievement of expected objectives might also motivate partners to add on new activities to address other constraints or issues. Partnerships also can be formed based on institutions' assessment of the tangible goods they may derive from the relationship. For instance, building institutions' human capacity through training and on-the-job exposure to the expertise of others is tangible benefit.

Institutions benefit from collaboration with others, particularly if those collaborations strengthen an institution's credibility or raise its visibility. An illustration of this gain is the partnerships between NGOs and research institutions. The latter institutions' technical skills ensure that data are collected and analyzed following accepted research norms. This creates credibility for the results and the associated institutions. Staff gains satisfaction from the publication and dissemination of results that reflect their work and investments.

2.3.4 Factors Impeding Institutional Collaboration

The factors that impede collaboration that are identified in many literatures including Steven et al. (1997) appear to fall in to four main categories. These includes: those that are situation-specific; those that are process-related; those that arise from the societal context; and those that arise from the institutional context.

1. Situation-specific factors

A number of factors that are specific to particular situations may constrain effective collaboration. These factors include: power imbalances; lack of communication; technical and scientific issues; public opposition; and fundamental differences that separate the stakeholder institutions.

As far as power imbalance is concerned, Steven et al. (1997) noted that institutions will be understandably reluctant to collaborate if they are at disadvantage to adequately represent their interest or if they believe that their interest will be deemed secondary to more powerful ones. On the other hand, the stronger one often sees little need to compromise or otherwise involve the weaker party, which lacks the power to influence the course of events on its own. Kanter (1994) (cited in ibid), further notes that to make collaboration work, more communication than anyone anticipated is necessary, and thus, difficulties with communication or a lack of trust can make successful collaboration hard to achieve.

Technical factors inherent in collecting and sharing data can have stymied multi-party efforts; meaning that, differences in data collection methods and analytical techniques can make it difficult for groups to combine information in useful way. Oppositions by public to goals or methods of a collaborative project can pose barriers that make it difficult for a collaborative effort to succeed. Fundamental differences between stakeholder institutions is presented in Steven et al. (1997) as a significant barrier to collaborative problem solving, as they might have basic ideological differences, and historical antagonisms.

2. Process-related factors

Given the importance of collaboration, ineffectively running or structuring a collaborative process greatly reduces its chances for success. The process-related factors which impede collaboration discussed in Steven et al. (1997) include: a lack of focus on process; a lack of process management or interpersonal skills; resistance to collaborative management styles; and difficulty securing the involvement of all relevant stakeholders.

A failure to appreciate the importance of process-related questions and to spend enough time on process-related discussions is an important barrier to collaboration, as Gray (1989) noted convenors and negotiators frequently underestimate the critical role of technical planning process in ensuring successful collaboration. The complexity of collaborative effort further suggests the need for effective process management and interpersonal skill, where its lack seriously hampered it. Many leaders may also be resistant to adopt a new roles and skills required to manage a collaborative process successfully as it may threaten the leaders' traditional views of their previous roles. Difficulties in identifying and involving all relevant

stakeholders can lead to opposition from parties who feel excluded from the process, and this often prevents collaborative efforts from succeeding.

3. Social Context

The societal context within which policy decisions are made can prevent significant barriers to collaboration. These include attitudes held by individuals, groups, and agencies that often push institutions apart, rather than foster collaboration. Societal barriers to collaboration discussed in Steven et al. (1997) include: cultural norms; stereotypes and intergroup attitudes; polarization arising from traditional decision-making processes; opposition by public interest groups; and politics.

For instance, individualistic cultural norm can be an obstacle to collaborative process; exaggerated or false intergroup attitudes can also constrain effective communication that is a starting point for building the game. Traditional forms of decision-making reinforce group differences and make it more difficult for them to work collaboratively. Adversarial decision-making processes promote strategic polarization in the ways that groups define themselves, emphasizing their differences.

4. Institutional Context

In addition to societal barriers, there are also several institutional factors that constrain collaboration. Institutional barriers to collaboration identified in Steven et al. include: conflicting agency goals and missions; problematic organizational norms and culture; lack of top-level support for collaboration; resource constraints; and problematic government policies and procedures

Institutions do have real differences between their goals and missions as defined by statute, tradition and political realities, and collaborative efforts highlight conflicts between these goals. These conflicting missions might lead to differences in assessing priorities for various activities. Informal norms, values and traditions might make it difficult for groups to collaborate. In some cases, even if local institutions pushed cooperative approaches forward, a lack of support for such efforts from upper level of management hampered their efforts. Resource constraints such as lack of time, money, and skilled personnel have been noted as obstacles to collaboration.

2.4 Lessons that can be learned from the Collaboration Literature

Most of the literatures on collaboration underlined the need, role and importance of collaboration for social and economic well-being. What is not well discussed is, the complexities in collaboration; for example, why some collaborative activity is successful and other collaborative activity is not? White (2001) pointed on the issue that, with their different histories, practices and purposes, it can be expected that institutions will and do experience difference, tension and conflict. Collaboration across different institutions with different practices and histories, often referred as "boundary crossing" (Engeström et al., 1995), raises issues concerning priorities, identities and operational methods, as well as questions about relative authority and influence. Hence, collaboration in this case can be understood as a tension laden process as a result of the bringing of diverse organizations together, with different purposes and cultures. Boundary crossing is to refer the areas of overlap, connections and possibilities for participation. It is a space for shared practice and experiences, processes, procedures and tools (Engeström, 2000). Saying the critical role of institutions in adapting climate variability impacts, it is therefore critical to better understand how a sense of collective concept formation is developed as different institutions with different histories interact across this space.

Luff et al. (2000) suggest a sense of collective image can be achieved through the use of tools in collaborative activity and in the process cognitive activities are distributed, that is, people appear to think in conjunction or partnership with others with the help of culturally provided tools and implements. The tools that may assist in overcoming such barriers include different types of shared external representation of a problem or domain (Engeström et al., 1995). These external representations are described by Engeström et al., (1995) as 'mediating artifacts' and by Star (1989 cited in Luff et al.,2000) as 'boundary objects' and are used to make systemic tensions visible (Engeström et al., 1995). Boundary objects or mediating artifacts may include a physical object, and/or a set of cognitive tools. The boundary objects become the focus of dialogue, of knowledge construction, of argumentation, of story-telling to make meaning, facilitating shared understanding. Hence, collective concept formation takes places through dialogue, argumentation, and shared artifacts (Engeström et al., 1995). It is only possible if participants are able to recognize an experience of meaning in each other and develop enough of a shared sense of competence to

do some mutual learning (Wenger, 1998). As participants are exposed to different forms of engagement, difference may encountered, unfamiliar territory may entered, uncertainty is experienced and as Blackler (2004) notes, the severity of this uncertainty depends on the ways in which people or institutions deal with tensions.

Optimistically, Engeström et al. (1995) described this tension and uncertainty as a good potential for new learning. However, it does not mean that learning for collaborative activity will automatically follow. Barriers include limited motivation to consider alternative courses of actions (Janis, 1983 in Engeström et al., 1995). A lack of shared mental models can also be a barrier to boundary crossing. Fragmentation of viewpoints makes it impossible for institutions from different contexts to speak the same language and exchange ideas about a problem (Engeström et al., 1995). To develop shared mental models requires conscious access to concepts that may be deeply embedded, preventing reflection and the development of shared language and ideas.

Boland and Tenaski (1995) illustrated the ways of making visible the perspectives of others to facilitate shared understanding. One is the process of examining one's own assumptions and those of others, and of imagining the point of view of others. Next, the diverse knowledge held by individual institutions must be made available for others so that, differences are recognized, acknowledged and valued. It is only after a perspective is differentiated can it be reflected on and represented so the actors from different groups or activity systems have something to integrate. Once a representation has been made of an individual's knowledge, it becomes a boundary tool, providing a basis for communicating appropriately and meaningfully (Boland and Tenaski, 1995)

For empirical and/or practical learning about institutional collaboration, further attempts have been made to look for evidences of success stories. Indeed, though it is not explicitly on adaptation to climate variability impacts, and it do not deeply assess how the institutions operationalize their collaboration, a review of the literature yields certain success stories that resulted from institutional collaboration. As described in Welch et al., (2000) in Malawi, institutions such as Self Help Development International (SHDI) and Irish nongovernmental organization, worked collaboratively with community members and

counterparts from the Ministries of Agriculture and Irrigation, Health and Population, Forestry, Fisheries and Environmental Affairs, Women, Youth and Community Service, and Education and Culture to develop community action plans. The partnership brought together expertise in different technical areas and different social structures (households, communities, and institutions) by using a highly participatory, gender-sensitive approach. Problems that were identified included low crop yields, inadequate access to financial capital for startup and recurrent costs, lack of fuel wood, and inadequate and unsafe drinking water. Once these problems were viewed in their entirety and their interactive relationships defined, it became clear that addressing one problem had implications for others and that planning an intervention strategy that addressed multiple factors in an integrated fashion made the most sense.

It has been noted that, although the process was time intensive and required much oversight in terms of keeping the collaborative process and partners together, it is likely that the solutions has been carried out and sustained because of the high degree of ownership. Indeed, because of the extensive degree of involvement of the relevant stakeholders in the process, no one felt any one problem or solution was someone else's responsibility. The project also developed a manual that can be used by others as a means to replicate the process, procedures, and methods.

It has further noted, as the collaborative process had its own difficulties. During the problem-solving process, community members saw problems as isolated issues rather as interrelated clusters. Further, their preference was to deal with problems sequentially, from those that were most urgent or immediate to those that were more distant (either conceptually or temporally). It is noted that, food availability (manifested by hunger) was an immediate problem that they wanted to address before all others. Conversely, the Ministry and NGO staff often saw things more holistically and wanted to address the fundamental issues because they realized that neglecting them would lead to only short-term resolutions of problems, rather than long-term improvements. Thus, it is described as there was a continual need to ensure that both the short-term needs and long-term constraints were

addressed in the community action plans, and that the plans addressed multiple needs in as integrated a manner as possible. Therefore, the lessons of this story are;

- Collaborations were initiated at the earliest possible stages of project development;
- Institutions were invited into the process based on their comparative advantages in terms of technical expertise, skills, and relationships to the community;
- Immediate, short-term needs of the community were addressed and contributed to establishing the credibility of a process that aimed to build the problem-solving capacity of all stakeholders as a means for supporting long-term sustainable change;
- Institutional commitments were made to use a time-intensive process in the initial phases to gain long-term benefits in terms of ownership and overcoming entrenched practices, beliefs, and attitudes.
- The donor's willingness to provide funds could also be another factor.

2.5 Relevant Theories on Stakeholder Collaboration

Two theories that might have particular relevance in studying local stakeholder collaboration in adapting climate variability are Coalition theory and Stakeholder Model (SHM). The Coalition theory was developed to explore collaborative partnerships in health and defines health as a multi-dimensional issue that demands input from multiple sectors (Beaudry 1999 in Walch et al., 2000). This theory suggests that the success of coalitions is based on partners' perceived rewards for joining the coalition, the political assets they bring to the coalition, partners' non-utilitarian preferences (the inclination to join the coalition), the coalition's decision-making rules, and the organizational context within which the coalition operates (O'Neill et al. 1997 cited in Ibid).

Similarly, the Stakeholder Model (SHM) is an institutional framework or structure which adopts the multi-stakeholder process of governance or policy making, which aims to bring together the primary stakeholders such as businesses, civil society, governments, research institutions and non-government organizations to collaborate and participate in the dialogue, decision making and implementation of solutions to common problems or goals (World Bank, 2006).

2.6 Review of Policies on Climate Adaptation in Ethiopia

Climate change is a real threat to the lives and livelihoods of millions of people in Ethiopia. Since the effect of climate change is becoming evident, adaptation to climate change becomes an integral component of government policy. As an initial step toward addressing climate issues, Ethiopia ratified both the UNFCCC and Kyoto Protocol (NMA, 2007). There are also a number of existing national policy initiatives, sectoral policies, programs and strategies that may directly or indirectly address climate change adaptation in the country. The most relevant policy and program documents that have relevance for climate change adaptation include Environmental policy of Ethiopia, Agriculture and Rural Development Policy and Strategy, Water resources Management Policy, National Policy on Disaster Prevention and Preparedness, National Adaptation Programme of Action and etc. In fact, the constitution of the Federal Democratic Republic of Ethiopia itself through its Articles 43 and 44 promulgates sustainable development and environmental rights and duties which have something to do with climate adaptation.

Ethiopia's Environmental Policy, ratified in 1997, focuses on the sustainable use of renewable and non-renewable resources, the maintenance of the ecosystem and the rehabilitation of degraded regions. Article 3.9 (a), Article 3.9 (c), and Article 3.9 (e) of the policy are directly or indirectly on adaptation to, or mitigation of, climate change. Article 3.1 with its 19 sub-articles further deals with the care that everyone should use to sustainably manage the soils of the country in the unpredictability of floods, droughts and winds that climate change is set to exacerbate. Article 3.2, with its sub-articles, covers the management of forests, woodlands and other woody biomass resources so as to maximize wood production for both climate change mitigation and adaptation. Article 3.3, with its 11 sub-articles, shows both the existence in Ethiopia of genetic resources that are of global importance, as well as the management that these genetic resources need for agricultural systems that would be robust now and in the coming future of a changing climate. In general, most of the principles set out in the Environmental Policy are relevant to adaptation to, or mitigation of, climate change.

In the Agriculture and Rural Development Policy and Strategies which adopted in 1993, although the problem of climate change is not explicitly mentioned or directly addressed, the principles such as promoting agricultural development is explained. The policy also recommends rangeland management and conservation based on traditional management systems.

The National Water Resources Policy and Strategy is aimed to develop proper use of available water resources; introducing improved methods of water conservation, storage, and rational use; construction of small check dams and rainwater harvesting schemes to meet water supply for domestic and irrigation use; undertaking soil conservation measures that help to reduce soil erosion and siltation and also reduce the pollution of water sources; implementing watershed management and water conservation programs/projects that promote local community participation; introducing disaster prevention actions and methods to prevent floods, including maintenance of flood control structures; and managing and tackling droughts as well as the associated slow on-set of diseases.

Ethiopia has a National Policy on Disaster Prevention and preparedness, released in 1993, which focuses on ameliorating drought impacts. Interventions included in this policy are provision of relief services and elimination of the underlying causes of vulnerability to disasters. It is noted that the Early Warning and Response Department (EWRD) of Ministry of Agricultural and Rural Development is preparing a Disaster Risk Management Policy.

Ethiopia also has a National Climate Change Adaptation Programme of Action (NAPA), created in 2007. Land degradation, soil erosion, deforestation, loss of biodiversity, desertification, recurrent drought, flood and water and air pollution has been listed on the document as major environmental problems of the country. The NAPA emphasizes droughts as the most threatening climate-related hazard facing Ethiopia. It recognizes high dependence on rain fed agriculture, under-development of water resources, low health service coverage, high population growth rate, low economic development level, low adaptive capacity, inadequate road infrastructure in drought prone areas, weak institutions and lack of awareness, as key underlying causes of Ethiopia's vulnerability to climate change. The NAPA proposes a prioritized list of adaptation projects, which include

enhancing agricultural productivity, irrigation, early warning systems for droughts and floods, water resource development, and research and development.

The Climate-Resilient Green Economy (CRGE) plan of Ethiopia, another relevant plan, has an overall purpose to protect the country from the adverse effects of climate change and to build a green economy that will help realize its ambition of reaching middle income status before 2025. It has a prime objective to identify green economy opportunities that could help Ethiopia reach its ambitious growth targets while keeping greenhouse gas emissions low. Accordingly, improving crop and livestock production practices for higher food security and farmer income while reducing emissions; protecting and re-establishing forests for their economic and ecosystem services, including as carbon stocks; expanding electricity generation from renewable sources of energy for domestic and regional markets; and leapfrogging to modern and energy-efficient technologies in transport, industrial sectors, and buildings are four pillars identified in the green economy plan.

To sum up, the Ethiopian government has taken up the issue of climate change and adaptation among the priority policy agenda. The question is how the principles set out in the policies, strategies, programs, and plans described above are being applied by local stakeholders collaboratively.

2.7 Conceptual Framework of the Study

In this paper, following Agrewal et al., (2009), the analytical focus is on the broad domains of institutions; particularly the public/government, private/market, and civic/community to cover the range of institutions relevant to adaptation to climate variability.

Even if there might exits multiple domain of institutions in a given location, they may not have sufficient capacity or expertise to facilitate adaptation which may require the pursuit of a mix of objectives through flexible operational strategies. In collaboration however, each type of institution may be able to overcome the weaknesses of its partners in responding to climate variability impacts. Hence, whether or how collaboration the institutions are, in terms of collective actions, information and resources sharing, division of tasks, and joint planning and implementations is another focus of the study. It has been noted that factors

such as: Trust and partner compatibility; common and unique purpose; shared governance and joint decision making; clear understanding of roles and responsibilities; open and frequent communication; and adequate financial and human resources are most likely to impact the success of institutional collaborations.

In line with this, there might be certain factors that contribute to institutional collaboration, and on the contrary, there might also be factors constraining the game, still another focus of the study.

To sum up, as indicated in the figure below, the framework look in to institutional domain of a place; assess whether or how collaboration the institutions are; and address whether there are factors either contributing or impeding to institutional collaboration.

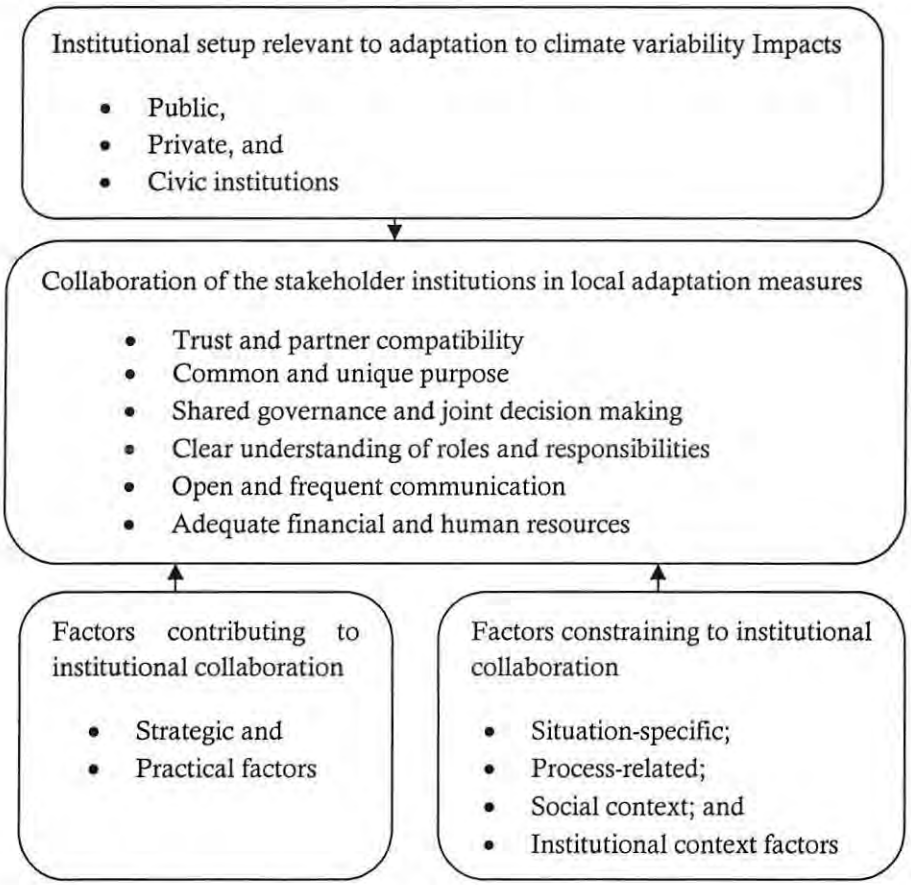

Figure1. Conceptual framework of the study (Source: Compiled from the literature review)

CHAPTER THREE

STUDY METHODOLOGY

3.1 Description of the Study Area

Mereb Leke woreda is one of the 36 *woredas* in Tigray region. It is about 1048 and 265 kms distant from the capital Addis Ababa and the capital of the region Mekelle respectively. In relation to other *woredas,* it is bordered on the south by *Lailay Maychew*, on the south west by *Tahtay Maychew,* on the west by *Semen Mirab* (North east) zone, on the north the *Mereb River* (which separates it from Eritrea), on the east by *Ahferom* and on the south east by Adwa. The administrative center of the *woreda* is *Rama.*

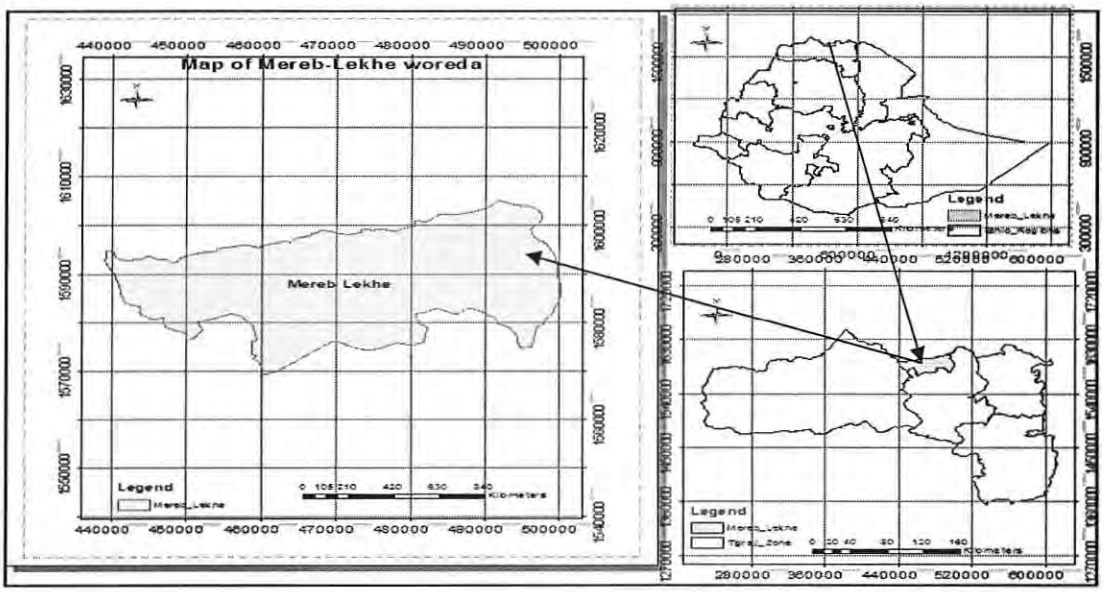

Figure2. Map of the study area (Source: Mekelle University, GIS and RS laboratory)

The *woreda* is known, as one of the drought prone *woredas* in Tigray, where its climate is characterized as *Kolla*, usually, the rainy season starts in the late June, peaks in July and trails off in the late August. The annual mean temperature of the *woreda* is 25-37 degree Celsius. The annual mean rainfall ranges from 400-600 mm, which makes the *woreda* usually moisture deficit resulting in recurrent droughts (ARDO of the *woreda*, 2013).

According to CSA (2007), the *woreda* has a total population of 107,218, of whom 53,425 are men and 53,793 women; 7,911 or 7.38% are urban inhabitants. With an area of 2,521.70 square kilometers, *Mereb Leke* has a population density of 42.52, which is less than the Zone average of 56.29 persons per square kilometer. A total of 23,370 households were counted in this *woreda,* resulting in an average of 4.59 persons per household. Residents of the study area are mainly dependent on land resources including forests and grazing lands for their livelihoods. Mixed crop-livestock farming is the backbone of the livelihoods of households in the *woreda.*

3.2 Research Design

The research employed a qualitative research process and case study is chosen to be a research design of the work, hence, a case study of collaboration amongst institutions in adapting climate variability in *Mereb Leke woreda.* It has been widely described that the approach provides a mode of inquiry for an in-depth examination of a phenomenon (Yin, 2003).

3.3 Data Sources

The study relied on both primary and secondary data sources. The primary sources of data include: key informants, leaders of institutions, members as well as farmers; and secondary sources such as: documents, reports and other records from different stakeholder institutions and bureaus.

3.4 Data Collection Instruments and Procedures

The data collection was conducted from Jan. 21 – Apr. 10, 2013. Interviews with key informants; FGDs with community members; interviews with leaders and members of institutions; along with personal observation, and review of documents from relevant bureaus were the data collection methods of the research.

At the beginning, in order to identify which stakeholder institutions are parts of the study, key informant interviews were carried out with various relevant people and professionals in the *woreda.* Then, a number of interviews and discussions with key staffs of the focal *woreda* level institutions and NGO's; Agricultural and Rural Development Office (ARDO); Environmental Protection and Land Use Administration Agency; Water Resource, Mine

and Energy Development Office; Construction of Road Transport Office; *Mereb Leke* Basic Vine Multiplication Center; Relief Society of Tigray (REST); and *Dedebit* Microfinance have been made. The number of interviewee per institution varied. For instance, in ARDO around 6 staff members has been interviewed many times, due to its vast nature of the office while only one in case of the office of *Dedebit* Microfinance. The interview emphasized on trends of climate variability in the *woreda*, major activities of the institutions, their structure, collaboration with other institutions, areas of collaboration, and etc.

At community level, in a three randomly selected *tabias* (*Wedihazo, Haftom* and *Awet*), initially elderly were interviewed and 3 FGDs, one per each *tabia,* were held, with whom discussions were detained regarding drought and climate variability issues. To investigate the kind of institutions supporting or influencing households to adapt to climate variability, discussants were asked to indicate the institutions they have contacts with and those that have been helpful or influential in climate adaptation. Accordingly, a number of institutions such as local authorities, extension agencies, cooperatives, associations, religious institutions, and informal village groups such as *Idirs* have been identified. Discussants indicated the purpose of contact and type of assistance obtained from each institution. Then after, many interviews and discussions with leaders and members of the identified institutions have been made. In general, 35 institutions and a total of 53 representatives are interviewed sporadically.

In line with this, at field level, various adaptation measures such as: check dam, diversion, water harvesting structures, irrigation scheme and fruits farms, beekeeping, dairy, SWC works such as gully rehabilitation, area closure, etc. were observed along with discussions and interviews with people and institutions directly responsible in the field. Available secondary documents; collaboration agreements, plans and reports have also reviewed from relevant bureaus and institutions. For instance, collaboration agreements, physical plans and implementation annual reports were reviewed from ARDO, environmental protection and land use management agency, and REST.

3.5 Data Analysis

As indicated in Yin (2003), qualitative data analysis is an integrated part of the data collection, where the researcher might analyze as the research progresses, continually refining and reorganizing in light of the emerging results. In this research, the data that has been collected through interviews, FGDs, observations and documents helped me to harness diverse ideas about the issue. Consequently, it assisted in cross-checking the results, increased the validity of the findings and eased analysis of the data thematically.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

The result and discussion section contains three major areas. In the first place, the report contains descriptions of the institutional set up of the *woreda*. Second, the study shows the analysis whether and how collaboration the institutions are, in a major local adaptation practices. Recognizing that no strong culture of collaboration amongst local stakeholder institutions is existed, the final section has descriptions of challenges that hampered collaboration in the study area.

4.1 Institutional Setup in Mereb *Leke Woreda* and their Role in Adapting to Climate Variability Impacts

FGDs, interviews with various key informants, and discussions during fieldwork have revealed several layers of major findings of the institutional setup in the *woreda.* In the three sample *tabias* in particular, existence of several types of public and community institutions has been identified. In a more concise manner, all the institutional presences in the *woreda* can be classified in three generic types as public, private and community institutions in their range of formal and informal institutions.

4.1.1 Public Institutions

4.1.1.1 *Woreda* Level Government Agencies and Offices

It was observed during the field that some of the *woreda* level government institutions have agents and representatives posted in their respective *tabias.* Five *woreda* level government institutions are found operating in the field. Among these institutions the Agricultural and Rural Development Office (ARDO) has three experts in *tabia,* and in some *tabias* four experts. All the government offices and agencies at *woreda* level have sectoral mandates of their own and usually have distinctive work-plans. A list of the major offices and agencies operating at *woreda* level with their mandates are outlined in the following table.

Table 4.1 Major offices and agencies operating at *woreda* level in *Mereb Leke* and their mandates

No	Office/agency	Mandates
1	Agricultural and Rural Development Office	Multi-purpose development including irrigation and agricultural development. Cooperative services and development.
2	Agency of Environmental Protection and Land use Management	Environmental education and awareness creation services, land distribution and redistribution activities
3	Water resource, Mine and Energy Office	Water, mineral and energy resources development activities
4	Construction of Rural Road Transport Office	Rural road construction services
5	*Mereb Leke* Basic Vine Multiplication Center	Research and multiplication services
6	Development of Trade and industry Office	Trade and industry development services
7	Education Office	Development of educational activities
8	Finance and Economic development Office	Finance and economic development services
9	Health Office	Public health services.
10	Justice Office	Offering justice services
11	Civil Service Office	Civil service development and capacity building services
12	Secretariat of *Woreda* Council Office	Secretariat services
13	*Woreda* Administrative Office	Over all administration services
14	Public Diplomacy Office	Public diplomacy services
15	Labour and Social affairs Office	Labour and social development services
16	Police and Security Office	Peace and security issues
17	Youth and Sport affairs Office	Youth development and training services.
18	Women affairs Office	Women development and training services

Source: Document review, 2013

As a result of their intimate relevancy for adaptation to climate variability impacts, and their contact in the day-to-day activity of farmers, the activities, arrangements, and collaboration approaches of the first 5 government offices, and other *tabia* and community level institutions have been detailed via repeated interviews and discussions with leaders and members of the respective institutions. The rest institutions don't mean they were irrelevant. The intension was that their activities and role in climate adaptation could be researched, in one way or in the other way round, via the first 5 *woreda* level institutions and other community institutions.

1. Agricultural and Rural Development Office

Various governmental stakeholder institutions in the *woreda,* particularly the Agricultural and Rural Development Office (ARDO) is currently working on climate-related issues. The bureau has been involved in various early warning, emergency relief, rehabilitation, and natural resource management activities. The donor funded Productive Safety Net Program (PSNP) in the *woreda* is also channeled through the agricultural and rural development office in collaboration with the Relief Society of Tigray. It has been noted that many adaptation and development activities are undertaking in the *woreda* through the public work component of the program. Key activities include soil and water conservation, social infrastructure (schools and health posts), rural road construction, water supply, small-scale irrigation and earth dams and agricultural services including the construction of farmer training centers and the like.

In terms of accessibility and fund availability, it has been found that the bureau has close contact with the rural households and communities through its experts posted in their respective *tabias.* It is also noted that the bureau is obtaining assistance from INGO's such as FAO and WFP to undertake its activities. For instance, there exist fruit and vegetable nursery in the *woreda* supported by FAO.

The bureau has 6 departments within it. Major activities undertaken by each of the departments within the ARDO are indicated in the table below.

Table 4.2 Departments in the Agricultural and Rural Development Office (ARDO) and their major activities

No	Office/agency	Departments within the Office/agency	Major Activities undertaken in the *woreda*
1	Agricultural and Rural Development Office	Natural resource management	Nursery services, tree plantation, equipping farmers with technical skills and material support to undertake SWC activities etc.
		Agricultural input and Extension services team	Agricultural input supply, agricultural advice and extension, etc.
		Cooperative	Establishment of cooperatives in *tabias,* supply of inputs (seed and fertilizer) to farmers, capacity/skill development and awareness building activities.
		Irrigation team	Trainings and irrigation use awareness services
		Early warning, response and food security issues desk.	Suggestions for drought management, provides relief during and after disaster and leads the Productive Safety Net Program (PSNP) based activities (i.e. the direct support and public work components)
		Livestock Resource development team	Introducing a variety of caws, awareness creation and vaccination services

Source: Document review, 2013

2. Agency of Environmental Protection and Land Use Management

The environmental protection and land use management agency of the *woreda* has two major departments namely; the environmental protection department and the land use management department. As noted in an interview, since its establishment as an agency in 2010, the environmental protection department is taking a more active role in environmental education and awareness creation activities in rural and urban areas of the *woreda.* Similarly, it is noted that the land use management department is also involving in

land use management issues. Major activities of these two departments are summarized in the table indicated below.

Table 4.3 Major activities of Environmental Protection and Land Use Management Agency

No	Agency	Departments within the agency	Major Activities undertaken in the *woreda*
1	Agency of Environmental Protection and Land Use Management	Environmental Protection	- Environment education and awareness creation activities - Letting projects to undertake Environmental Impact Assessment (EIA) beforehand.
		Land Use Management	- Land distribution and redistribution activities - Providing land holding certificate to farmers - Providing solutions to land relate disputes

Source: Document review, 2013

3. Water Resource, Mine and Energy Office

Similar to the above public sector institutions of the *woreda,* the activities undertaken by the water resource, mine and energy office are more or less relevant to adaptation to climate variability. Departments of the institution with their activities are described in the following table.

Table 4.4 Departments of water resource, mine and energy resource office and their activities

No	Departments within the water resource, mine and energy office	Major Activities undertaken in the woreda
1	Irrigation Water Supply	- Pond retention and excavation supply for irrigation
2	Drinking Water Supply	- Excavation supply of potable water in rural *tabias* - Trainings and awareness creation services
3	Technology and Energy supply	- Introducing and supply of new technologies and energy sources to farmers - Trainings and awareness creation services
4	Mining	- Trainings and awareness creation services - Provision of license for groups of beneficiaries
5	Water Resource Management	- Awareness building activities - Assessments of water resource development potentials in the *woreda* and notifying to the concerned bodies

Source: Document review, 2013

4. Construction of Rural Road Transport Office

Along with other stakeholders in the *woreda* such as Relief Society of Tigray (REST), the Productive Safety Net Program and other *tabia* level institutions, the construction of rural road transport office of the *woreda* has been engaged in rural road access. However, is has been noted that most of the constructed roads failed to give service during summer season. It is only the older road, which has been constructed by Italians during the occupation 1935-1941, give service throughout the year for little portion of the *woreda.*

5. *Mereb Leke* Basic Vine Multiplication Center

This center is a branch of Axum Agricultural Research center and a sub-branch of Tigray Agricultural Research Institute. It is noted that the center is supported by USAID. The center is participating actively in introducing new variety of seeds and technologies to beneficiary farmers in collaboration with ARDO of the *woreda.*

4.1.1.2 Institutional Setup at *Tabia* Level

In the three sample t*abias* (*Wedihazo, Haftom* and *Awet*), the structure of government institutions in the grass root level is uniform. In each *tabia,* an executive committee, in its old name *Baito,* now called *Meseretawi Wudabe,* having 15 members including the *tabias* chairperson and secretary, undertakes the overall process of governance and community development in their respective *tabias.* These members are directly elected by the community themselves. At the minimum, two women members in the committee are required. It has been observed that, some of the representatives of *woreda* level offices assigned in *tabia,* named *Development agents* are also members in the *Meseretawi Wudabe.*

Under this executive committee, the *Meseretawi Wudabe,* the whole community members are assigned in institutions called *Developmental groups.* One *Development group* contains 25-30 members. This institution, the *Development group,* is responsible for extension and execution of development activities at their respective group.

The lowest government institution below *Development group* in a village is named as *Network.* One N*etwork* contains 5-6 members. A single *Development group* is a sum of 5 or 6 N*etwork* institutions. In *Awet, Haftom* and *Wedihazo tabias,* for instance, there are a total of 62, 63 and 51 *Developmental groups* and 310, 301 and 255 *Networks* respectively (see the table below). In terms of gender, it has been observed in the three *tabias* that, members of a single *Development group* and N*etwork* are exclusively men or women.

Table 4.5 Number of Developmental groups and Networks in the study tabias

No	Name of *Tabias*	No of *Developmental groups*			No of *Networks*		
		M	F	Total	M	F	Total
1	*Awet*	31	31	62	155	155	310
2	*Haftom*	29	34	63	145	156	301
3	*Wedihazo*	20	31	51	100	155	255

Source: Field study, 2013

The major activities of these *tabia* level government institutions (*Meseretawi Wudabe, Development agents, Developmental groups* and the *Networks)* is summarized in the table indicated below.

Table 4.6 *Tabia* level government institutions and their major activities

No	***Tabia* level government institutions**	**Major Activities**
1	*Meseretawi Wudabe*	*Tabia* level decision makers and undertakers of the overall process of governance and community development in the *tabia.*
2	*Development Agent*	Experts of the ARDO, health office, and other offices of the *woreda* assigned in *tabia* to help farmers in technical aspects of new technologies and adaptation practices.
3	*Developmental group*	Extension and execution of development activities decided by the *Meseratawi wudabe* in their respective group.
4	*Network*	*Network* leaders take information or an instruction from the leader of *development group* and disseminate and implement with their 4 or 5 members.

Source: Field study, 2013

4.1.2 Private Institutions

4.1.2.1 Non-Governmental Organizations

As it has been discussed earlier, INGO's such as WFP and FAO are working with ARDO of the *woreda.* Other INGO's such as UNICEF are also working with health office of the *woreda.* In addition to this, in *Mereb Leke Woreda,* national NGO's, particularly the Relief Society of Tigray (REST) and Dedebit Microfinance are the only two national NGO's operating intimately with public sector institutions.

I. Relief Society of Tigray (REST)

It is noted that the Relief Society of Tigray (REST) was established in 1978 to assist the war and drought affected population of the areas of Tigray that the Tigrean People's Liberation Front (TPLF) controlled. During the war with the Derg, REST lead famine relief operations and repatriation programmes. After the victory in 1991, the institution has gradually changed its approach from relief to rehabilitation and development activities.

According to the interview with leaders of the institution, FGDs with communities and field visits in the study *woreda,* today REST has been engaged in environment and agriculture, water management, emergency aid and many other activities including the following.

- Natural resource management activities including rehabilitating degraded commons through creating area enclosures, catchment treatments, gully reclamation, water harvesting, check dam and underground tankers
- Infrastructure development (Rural road access)
- Improving access to drinking and irrigation water
- Health related activities (nutrition supply)
- Education activities (construction of buildings)
- Fruit and Vegetable Production
- Supply of new variety of caws *(Begaits)*
- Social protection services. It is noted that USAID/DFAP, Well-wisher, Alive and Thrive, BMZ/ Help age international and GOH charity are partners of the institution to undertake its activities. REST's funds are accessed through proposals submitted to these international donors.

II. *Dedebit* Microfinance

Dedebit is a non-profit micro-finance local institution that grew out of the Relief Society of Tigray (REST). Since 1982 *Dedebit* has become an independent microfinance institution. Today, it has been noted in the interview that approximately 90 percent of community members in *Mereb Leke* take some type of loan either to recover from risk or improve their adaptive capacities from the institutions. The remaining ten percent may be are either too rich to need a loan or are too poor to feel they can assume the risk of taking the loan.

It is noted that there are two forms of loans on which *Dedebit* Microfinance is currently delivered. The first one is, loans given in the form of a household package. This includes loans and associated inputs such as cows, beehives, farm tools and petty trading. This package has a different set of terms associated with it; for instance, someone taking a loan in the form of a cow is required to begin repayment after two years, and must complete repayment after four. Loans for petty trading have much shorter repayment periods; these loans must be completely repaid every month. Secondly, individual loans are also available in cash or in kind, and youth and the landless now have loan access.

In relation to the interest rate of the institution, in the recent years, the rate has increased from 9-15 percent. Indeed, many households across FGDs in the study areas pointed out that the increased interest rate has had a dramatic effect on their willingness to take loans, as well as on their ability to repay in the face of continued drought. Discussants weren't sure of the reason for the increase. Interviewee of the institution on the other hand underlined that the increment is to ensure the sustainability of the credit institution.

4.1.2.2 Private Businesses

Private businesses that can help farmers to adapt to climate variability impacts are not yet been observed in the study area. This may be is, due to the remoteness, and peace situation of the area, the fact that the *woreda* has boarder with Eritrea.

4.1.3 Community Institutions

There are a number of governance, religious and service institutions, and others in relation to agriculture, natural resource management etc., within the three *tabias* (*Wedihazo, Haftom* and *Awet*). Before the direct explanation of these community institutions found in the study *tabias*, there were two difficulties in categorization and explanation of these institutions. One, it was difficult to classify these institutions in to mutually exclusive categories. This is because of considerable overlap among the supposed categories. Some informal community institutions even have multi-dimensional purposes which makes it difficult for the institutions to classify in to categories. For example, institutions under, say it, 'education' category may be primarily concerned with 'service provision', another supposed category, in that they may take the lead in constructing a rural primary school but also play a role in how the school is run, ('governance' still another supposed category). Conversely, those that have a significant role in 'governance' may derive their authority from a 'religious' base and also play a role in 'service' provision as well as having a 'social' function. The second difficulty is that, some institutions with in the community are indigenous, initiated and administered by the community themselves. On the other hand, other institutions in the community are initiated by external support (government or NGO) but administered by the communities. Hence, explaining the latter as community institution seemed difficult.

Recognizing these two difficulties, all the informal institutions existed in the community have been described haphazardly from the point of view of influencing the communities' adaptation to climate variability impacts. Institutions including; those initiated with the support of outside body and those initiated and administered by the community themselves are explained in the following way.

4.1.3.1 Religious Institutions in the Study Area

Religion plays a major role in the behavior of the people of the *woreda.* The religious composition of *Mereb Leke woreda* is almost exclusively Orthodox Christian, constituting 98.41 percent of the population (CSA 2008), and as a result the people are subject to the norms and rules of the Orthodox Church. From an interview, I have understood that almost all households in the study *tabias* are in touch with religious institutions. In particular, religious leaders are able to define social behavior and conduct. Priests of the Orthodox

Churches in the three *tabias* tend to be influential and assume position. They ensure that the norms and rules of the church are followed, including a set of principles that put restrictions on when farmers can work in their fields in order not to conflict with observance of saints' days. In a large number of religious holiday dates of a month, mandated by the Orthodox Church priests, farmers are not allowed to work in their field. List of dates of a month where farmers in the study areas are restricted to work, are shown in the table below.

Table 4.7 Dates of a month, farmers in the study area are restricted to work and local name the holidays

Dates of a month, farmers in the study area, are restricted to work (E.C.)	**Correspondence local names of the holidays**
1	*Bahti*
3	*Beata, Abune Enteneous (*in *Wedihazo)*
5	*Gabr*
7	*Silasea*
12	*Micael*
14	*Abune Aregawi*
16	*Kidane Mihret*
19	*Abune Abyezgi, Gebriel*
21	*Mariam*
23	*Georges*
24	*Teklehaymanot*
27	*Medhanialem*
29	*Bealezgiher*

Source: Field study, 2013

The rest dates of a month (2,4,6,8,9,10,11,13,15,17,18, 20, 22,25,26,28 and 30) are *'work dates'* only if the dates don't lay on Saturday and Sunday. It is noted that there are also exceptional months that some of the so-called *'work dates'* would become restrict to work. Restricted *'work dates'* listed in the interview include; *Hamle* 02 and 08, *Meskerem* 17, *Nehase* 13, 17, 18, 20, and etc. These listed dates in particular are in peak farming periods in the study area. It is observed in the interview that, there are also little variations from village to village; date 03 for example is work date in villages of *Awet* and *Haftom.*

There also appears sub-institutions in the church named as *Mahbers* and *Senbetes* where a group of people come together to celebrate saints days, holidays and provide food and drink according to their turn. Members rotate in bringing food and drinks to be consumed by the priests often on a monthly basis.

The church's traditional approach to celebrate funerals in all the study *tabias* is costly and time consuming. It has been found that there are several steps involved in respecting the deceased and ensuring their passage to heaven. During the first seven days after a death in the family, relatives are required to bread for the priests who then pray the whole night for the dead person. The provisioning and praying continues for up to 80 days, after which it is decided whether the deceased will enter heaven or not. Once the relatives are able, they must host what is called *Teskar*, an elaborate celebration held for the community as a remembrance of the deceased. The *Teskar* often requires huge financial outlays, and there is social pressure to provide an ample feast and to invite large people including relatives from other parts. Households often go into debt in order to sustain this social custom.

As far as these church institutions and their role for adaptation to climate variability impacts is concerned, from the interviews and FGDs, there is near common agreement that these religious holidays in the church continued to have harmful effects on livelihood outcomes, particularly during times of recurrent drought. Interviewees felt that the church served primarily as a provider of spiritual assets, rather than a source of support to farmers to improve their adaptive capacity. "*It is God who gives help to people, because it is God that gives protection. At the same time, we need to help each other. Like a father giving help for his kids, we get help from the people of the church. The people are also getting help from government. That is how we are living now*" a priest interviewed in *Endamariam* church. In fact, many pointed out that the churches themselves are often suffering financially, and must be maintained through annual monetary contributions by their congregations.

4.1.3.2 Idirs and *Uqubs*

People of the study *tabias* rely to some extent on traditional institutions, such as *Idirs* and *Uqubs*, to help them to manage certain types of risk. *Idirs* in the study *tabias* are mostly used to help the cost of key social ceremonies in the community such as funerals and weddings. The costly nature of funerals in the study areas has already been discussed above. Weddings

are also almost equally difficult for many households to manage, as there is not only the wedding celebration itself to cover but also the dowry. Some reported that the size and value of dowries have been increasing. The male's family has to purchase jewelry. The family of the female usually gives livestock, the size of which depends on wealth and social status. Respondents across the FGDs felt that the expenses associated with these practices were exceedingly harmful to their ability to manage other aspects of their lives and livelihoods, particularly during drought periods.

*Idir*s, which have a key role in helping these key social ceremonies, are formed by community members without government involvement in the study places. It has been observed that almost every household in the place is a member in *Idir.* The payment is both cash and crop harvests and the amount varies across *Idirs.* Unlike in other urban areas where members of *Idir* pay monthly, in the study places, the payment is annual, particularly in spring, (i.e. a production season) where households could easily pay their payment. Most of the study *Idir* groups have elected officials. Members typically meet in the event of funerals and weddings. Money paid into the *Idir* is used as a group savings account to cover the steep cost of these social events. In addition, *Idir* group members give their labor to help execute the ceremonies.

Uqub, the other traditional institution, is a type of revolving savings and credit association. Despite their potential benefit however, *Uqub* institutions are not very common in the sample rural *tabias.*

4.1.3.3 Gender Based Institutions

Along the already discussed *tabia* level government institutions, such as the *Developmental groups* and the *Networks*, in the study *tabias,* there are three community associations established and run by the people themselves. These associations are Women's Association, the Farmer's Association and the Youth Association. It has been noted in the interview that, these associations were established long ago during the TPLF resistance to raise consciousness about the TPLF's ideology and policies. The associations, now, are at least formally disassociated from the TPLF. However, public institutions, local leaders, including the leaders of the *Developmental groups* take advantage of these established institutions to

continue to mobilize farmers for restoring the ecology of their environment and other development activities. The leaders of the *Developmental groups* and leaders of the associations themselves educate members of the associations on the importance of community work, agricultural inputs, irrigation and other development activities.

In each of the three associations, it has been noted that membership is voluntary. The Farmers Association is open to male farmers ages 31-60, and is supposed to be devoted to social management by transferring its experience to the next generation. Membership in the Farmer's Association requires a contribution of around four birr annually.

Women's Associations are open to women of any age. Their mission is to promote women's participation in economic development, to minimize harmful traditions such as early marriage, and to promote the rights of women within the community. Women association members that were interviewed seemed generally positive about the impact that their associations have had on improving the quality of life for women and girls. They reported that, through awareness rising, girls are increasingly educated at the same rate as boys. They pointed out that the associations have no resources to improve the plight of the poor, except through their focus on women's rights.

Youth Associations are open to males only, ages 18-30. Membership in the association requires a contribution of six birr annually. This type of association undertakes a wide range of activities, including participating in land rehabilitation and working to foster income-generating opportunities for unemployed and landless youths.

Leaders seemed to feel that these three associations have useful roles to play in helping members to prevent the effects of shocks such as drought. On the contrary, several discussants complained that their membership in the institutions required financial contributions, that there was pressure from government to join, and that the payments were not well accounted. They said as they did not see any benefit of their membership.

4.1.3.4 Political Party

Another community institution in the study *tabias* which has a role in mobilizing the community is a political party. Members of the political party, TPLF, in the study *tabias,* are grouped in categories 20-30 members forming an institution called *Wahyo.* Membership in the *Wahyo* requires an annual payment of 12 birr. It has been found that there are 38, 49 and 36 *Wahyos* in *Awet, Haftom* and *Wedihazo tabias* respectively. In contemporary mobilization of people for development activities, leaders take advantage of the historical legitimacy of the TPLF and members were constantly motivated during meetings to participate in developmental programs as a social duty. As resistance against the *Derg* regime was realized, poverty was presented to the farmers as their enemy and to fight, they must defeat through committed efforts in development programs.

4.1.3.5 Natural Resource Management Committees

Until 1990s, it has been noted that, communities in the study areas were not able to develop institutions, technology and management practices to maintain the level of welfare. As a result, they report that they experienced a severe degradation of some of their major assets; particularly the intense degradation of natural forests and the absence of tree planting tradition in place of the cut ones aggravated the problem of drought. A village elder in *Wedihazo tabia* narrated the decline in forest cover in the past decades as: "*I lived in this village since I was born. The village was green, covered by all big and indigenous trees. We (the community) had abundant trees and shrubs for fuel wood and house construction. But with increasing need of cropland and grazing land, most of the trees were cut to satisfy the needs.*"

In response to these problems, the local communities in the study areas established protected areas on the formerly degraded grazing lands for promoting natural regeneration of plants and other resulting benefits. It has been noted during the interview that, it is starting from the fall of Derg regime in 1991 that the *tabia* administration encouraged the community to devise village bylaws to manage communal forests on their own. Then, users established village bylaws to sustain management that define the uses, protection, and collective action in managing protected areas. In three of the study *tabias,* the village bylaws were set up in a public meeting organized by the then "*Baito*" of the respective *tabias.*

Then, the users with facilitation of the *"Baito"* assigned a village committee of five members that were believed to be representatives of the users (comprised of a head of village committee, a secretary, a cashier, and two model farmers) and guards locally called *Zeras* for enforcing the village bylaws that govern management of the areas. The criteria to be a guard of the area are to be a villager and to have good discipline, to be a young man that is strong to move around the enclosure and to keep it from cutting and animals to be committed to his job and enforcing the village bylaws, and to live close to the enclosure.

As an outcome, people in the discussions expressed support for the area enclosures stressing general ecological concerns and arguing that they were important for regenerating vegetation cover for soil and water conservation. They mentioned positive changes in the local environment including regeneration/growth of local and planted species. Some discussants said that honey production have increased along with the flowering vegetation. People even perceived increased tree cover to attract more rains. Communities harvest grasses by the cut and carry system to stall feed livestock, for thatching or for use in nurseries.

4.1.3.6 Institutions in Irrigation Site

Farmers in an irrigation site of *Medhin tabia* have formed their own institution called Water Users Association (WUA). WUA is a local institution and has a basic character of authority and regulations. It has rules, methods, sanctions for setting disputes among irrigation water beneficiaries and supervising provision of the irrigation water service. Under normal circumstances, everybody who is the beneficiary of irrigation water in the irrigation site is a member of WUA.

The WUA in the site has another elected committee called Water Users Committee (WUC), with seven members; one-chair person, one-vice chairperson, one secretary, one treasurer (cashier), controllers and other members. It also embraces a water distributor; locally called *Abo-Mai* who is responsible for everyday operation of the scheme. Under these water users associations and the executive committee, a new structure was created by water users with water course representatives at the outlet level. These leaders are in charge of any issue concerned with monitoring and controlling of water distribution in their group. The

water distributor controls these block (group) leaders at the scheme level. Usually, the water distributor is one person per scheme.

The executive committee is an official link between irrigation water users and the government officials in *tabia* and *woreda.* They represent irrigation landowners and not the government. While they are appointed by the water users, they don't have any formal office, payment or compensation for their services. Ownership of land within the same catchment's area, active participation within the community and possibly age are important considerations for appointment as a committee.

According to discussions with water user farmers, the principal duties of the executive committees and water distributor include: - enforcing the rules and regulations of the association; mobilizing the resources for operation and maintenance of the scheme; assisting all offices of the government in executive of their public duties and supply the required information; resolving any conflict that relates to water distribution; listening any complaints and give resolutions; etc.

4.1.3.7 Other Institutions

Table 4.8 Other community institutions with their descriptions

NO	Institutions	Descriptions
1	Dispute settlement committees	Among many other tasks, the committee, locally called *Shimagles*, deals with conflicts over local level developmental problems including the sharing of natural resources, and other related disputes.
2	School committee/Parent-Teachers Associations	It is made up of parents, community members and school staff. The committee mainly concerns about school governance and management.
3	Cooperatives	There exist rural cooperatives in the study *tabias* emerged by farmers via contributing 20 birr 10 years ago. Today, the cooperatives sell goods at a lower price than could be commanded by individuals.

		Respondents across the FGDs felt that there is potential for these institutions to expand their role and to be a useful livelihood support.
4	Social Safety Nets	There also exist a set of horizontal associations between farmers (locally called *Wefera, Lifinti*), consisting of mutual supports, social networks and associated norms that might have an effect on community productivity and well-being.

Source: Field study, 2013

To end up on the institutional domain in *Mereb Leke woreda,* there observes inadequacy of important institutions, for instance, weak development of market institutions, non-existence of metrological or climate information dissemination institutions, and institutions that seek solutions for crop diseases and pests. Market institutions were absent or not very strong. *"Lack of market opportunities is still a challenge regardless of efforts made by our government; many of our irrigation products has been perished many times as a result of lack of on time market"* a farmer in *Nefah* irrigation site. It is observed that farmers produce similar agricultural products leading to flooding of the markets with the same type of agricultural produce that caused a drop in price even to the extent of damping their perishable crops. While it could similar case throughout Ethiopia, metrological institutions as well as institutions that provide climate information to farmers were totally absent.

Respondents call for solutions on diseases and pests. It was mentioned that disease problem is recently becoming very serious on improved crop varieties and the yield is decreasing. The type and cause of the disease is not known and no control measure yet. Local name of the common disease include *Lemtsi,* which shown on fingers of millet that attacks head of the crop. Rust, locally called *Humodia*, is another very common disease. Respondents similarly reported as there is problem in getting adequate veterinary services.

Despite these inadequacies, it is possible to say that, most of the activities of the existed public, private and community institutions, in one way or in the other way round, are relevant for climate change adaptation. For instance, the activities undertaking by water

resource, mine and energy office and REST such as improving access to drinking and irrigation water is important for storage, while land productivity improvement and soil fertility restoration activities by the ARDO are relevant for both storage and diversification. Communal soil and water conservation measures, re-forestation and improvement of school and health facilities undertaken by many of the above public, private and community institutions are some of the typical communal pooling activities. Market exchange can also be improved through construction of rural roads and bridges. As far as mobility is concerned, it was 13 years ago that the *woreda* administration and other concerned bodies registered interested landless households and let them to western Tigray in the form of resettlement. Today, there is no formal government institution with such a mission.

4.2 Collaboration of the Stakeholder Institutions

The interviews and discussions with the selected key public, private and community institutions working at *woreda, tabia* and community level have produced certain findings regarding their form and extent of collaboration with in and along various institutions in the major local adaptation measures such as irrigation development; water harvesting; PSNP based activities; soil and water conservations; off-farm and non-farm activities, and rural road access practices identified across the FGDs held in the study areas.

4.2.1 The Local Adaptation Measures

4.2.1.1 Irrigation Development

In *Mereb Leke,* irrigation development is considered as an absolute necessity and has been adopted as the frontline strategy to bring about sustained food security due to its profound role in boosting agricultural production and productivity in this drought prone *woreda.* In *Nefah* irrigation site, a site that has been taken purposively for detail analysis of institutions across the irrigation, the Tigray Regional Water Resource Bureau initially provided an over sight. The diversion was then, constructed by the Tigray regional water resource bureau in collaboration with REST. Similarly, the *woreda* water resource, mine and energy office have a larger role in the provision of technical assistance for beneficiary farmers. Under the *woreda* agricultural and rural development office, the irrigation team sub-division still provides trainings and irrigation use awareness programs. There are also local organizations which attempt to assist the farmers through provision of input such as co-operatives.

Furthermore, a research institution, *Mereb Leke* Basic Vine Multiplication Center is also participating actively in introducing new variety of seeds and technologies to beneficiary farmers. The role of *Dedebit* Microfinance in this regard is critically important. It provides loans in the form of kind such as the irrigation equipment and in cash to the beneficiary farmers.

At the field level, for irrigation water management the beneficiaries collectively prepare and agree on a set of rules of restricted access to water and make arrangements of water for their plots. It is the Water Users Committee (WUC), water distributor and group leaders who are in charge of enforcing the use of restricted rules and regulations. These rules and regulations for operation and water management were formulated by the irrigation water beneficiaries in collaboration with the *woreda* agricultural and rural development.

Before the construction of modern schemes and those awareness and supportive activities, in the area, the community has long experience of using rivers and spring water for irrigation purposes without much knowledge and capacity of how to use the water effectively and how much benefit they would accrue using irrigation water. As an outcome, it is a recent phenomenon that farmers in the area have begun to cultivate cash crops such as onion, cabbage tomato, apple, orange etc.

4.2.1.2 Water Harvesting

It is noted that the overall implementation of the water harvesting program was guided by the *woreda's* leading institutions consisting of representatives from *woreda* cabinets, REST, *Dedebit* microfinance, ARDO, water resource, mine and energy development office, health office, education office, youth and sport affairs office and women affairs office. At *tabia* level the program was coordinated by the *Meseretawi Wudabe,* a committee composed of the *tabia's* chairperson, *Development agents*, *Development groups* and other concerned bodies.

Participants in the community FGDs noted that during the implementation of the water harvesting program the whole planning exercise was not thoroughly discussed with all concerned stakeholders. In all the study *tabias*, the most often cited failure of the implementation approach of the water harvesting program was that the planning started

without full farmer participation; it appears that many farmers were forced to construct the water harvesting particularly the ponds. Due to this, many visited ponds were constructed even in cases where it was not the most ideal location in hydrological and topographical terms; also, many ponds are constructed far from farmers' residences.

Many respondents expressed that beneficiary participation during the design and planning process particularly in pond water harvesting was almost none; due to this, pond beneficiaries could not develop a sense of ownership, making them not willing to fully use the stored water in the pond. Furthermore, coordination among the various *woreda* and *tabia* stakeholders, in this particular practice, was also weak. Indeed, particularly the mini pond (locally called *horeye*) construction that was introduced in the last few years with the objective of harvesting water for supplementary irrigation was not successful.

4.2.1.3 PSNP Based Activities

In the *woreda,* the donor-funded Productive Safety Net Program (PSNP) has two components, public work and direct support. In case of public work, money or wheat is given after the individuals have participated in community development work such as water harvesting, road construction, spit irrigation, soil water conservation and other development activities. There are five working days per month for eight consecutive months of a year, and 90 birr or 15 kilograms/person/month is given. Direct support is given for children, disabled people and old people without any need to work.

The program is channeled through the agricultural and rural development office (ARDO) of the *woreda* in collaboration with the Relief Society of Tigray (REST). This collaboration is in the form of division of tasks where the early warning, response and food security department of the ARDO undertake its development activities covering soil and water conservation, irrigation projects, and construction of public infrastructures using the *Development agents* posted in *tabias, tabia* level public institutions, community institutions and the beneficiary households; REST supervise the implementations and offers payment to the PSNP beneficiary in an effective way.

4.2.1.4 Soil and Water Conservations

To reduce runoff and soil erosion and maintain fertility of the soil, a number of management practices are being introduced. Free soil and water conservation work which is very common in the region is widely practiced on cultivated and uncultivated lands in the study *tabias* as well. In this free service, it has been observed that leaders of the *tabia* level government institutions *(Meseretawi Wudabe, Development Agent, Developmental group, Network),* leaders of the three community associations (Women's Association, the Farmer's Association and the Youth Association) and leaders of *Wahyos* mobilize all able bodied villagers, aged from 18-60 years old, in implementing the process. The practice is held for 24 working days. Occasionally, officials of the office of agricultural and rural development take charge of overseeing that the work was carried out. Hillsides treated with various soil and water conservation structures are protected from human and animal intervention and zero grazing is introduced.

4.2.1.5 Off-farm and Non-farm Activities

In part, to address the growing crisis of youth landlessness, the land use administration department of the environmental protection and land use administration agency has implemented a policy of distributing marginal land, in particular, the steep hillsides that are unsuitable for crop production. In these areas, youths, particularly those who form an association, are encouraged to invest in tree plantations along with other complementary activities such as bee keeping. Similarly, the water resource, mine and energy development office provides a license for groups of youths to engage in mining activities such as gold and sand collection.

4.2.1.6 Rural Road Access

Along with other stakeholders in the *woreda* such as Relief Society of Tigray (REST), the Productive Safety Net Program and other *tabia* level institutions, the construction of rural road transport office of the *woreda* has been engaged in rural road access. However, is has been noted that most of the constructed roads failed to give service during summer season. It is only one older road, which has been constructed by Italians during the occupation 1936-1941, give service throughout the year for little portion of the *woreda.*

4.2.2 The Extent of Collaboration amongst the Public, Private and Community Institutions

To determine the extent of collaboration amongst the stakeholder institutions, findings are discussed in reference to the six collaboration factor categories of the conceptual framework namely: trust and partner compatibility; common and unique purpose; shared governance and joint decision making; clear understanding of roles and responsibilities; open and frequent communication; and adequate financial and human resources.

4.2.2.1 Trust and Partner Compatibility

Most of the collaboration partners in the study area tend to be emphasized on public sector institutions and the local NGO's. In fact, the predominant local NGO's in the *woreda*, the Relief Society of Tigray and the *Dedebit* Microfinance are trusted and intimately linked with the public sector institutions. They use the government arms to undertake their actions. However, no chance is given for *tabia* level institutions and informal community institutions to come to a table, trust amongst, communicate more effectively, and reach in a mutually agreeable solution to climate variability impacts.

4.2.2.2 Common and Unique Purpose

Developing a common purpose, goals and objectives is an important factor in collaboration. However, in *Mereb Leke,* it is observed that the institutions across the public, private and community institutions have differing priorities which usually affects common vision and action.

4.2.2.3 Shared Governance and Joint Decision-making

Joint decision-making provides ownership of the collaboration by bringing partners together to develop plans to carry out the partnership agreement and identify organizational or systems changes that are needed to meet goals. Formally, at *woreda* level, it has been found that there is a collective committee named as *task force*. This committee is led by the chairperson of the *woreda* and having members from key institutions in the *woreda* (REST, *Dedebit* microfinance, finance and economic development office, ARDO, water resource, mine and energy office, health office, education office, construction of rural road transport office, youth and sport affairs office and women affairs office). It is noted that the work of this committee is to jointly plan development activities. There also exits a technical committee of professionals whose primary work is examining the feasibility of these plans.

4.2.2.4 Clear Understanding of Roles and Responsibilities

It has also found that, the w*oreda* level public sector institutions have formal written collaboration agreements. They named it *"inter face"* which deals about the roles and responsibilities of the collaborated parties. The implication is that everything is formalized and laid down, and the institutions know their own and other institutions' responsibilities. It is observed that the collaboration is more with institutions with whom they have common areas of interest. The *woreda's* Agricultural and Rural Development Office (ARDO) has, for instance, such an agreement with other institutions of the *woreda* such as agency of environmental protection and land use administration; water resource, mine and energy office; construction of rural road transport office; development of trade and industry office; youth affairs office; women affairs office; and justice office.

Similarly, the agency of environmental protection have such an agreement with education office; municipality of the administrative center of the *woreda;* early warning, response and food security issues desk, natural resource management and agricultural input and extension services departments of the ARDO; water resource, mine and energy office and rural road transport office. As it has been noted earlier, these *inter face* agreements indicated the duties of the collaborated parties. For instance, according to *inter face* agreement between Education Office and the agency, duties of education office include; formation of environment clubs in all schools of the *woreda,* training to school directors and club leaders and monitoring the activities of the clubs.

4.2.2.5 Open and Frequent Communication

Open and frequent communication is critically important for proper functioning and advancement of the collaboration. In the study area however, between the formal and informal institutions in particular it was limited for a number of reasons, including lack of knowledge, capacity, infrastructural constraints, and both technical and financial.

Apart from this, there exist informal communications with in the study communities which mainly depend more on individual efforts to network than on organizational mandates or initiatives. For instance, some farmers are the holders of rich and diverse indigenous knowledge that is important for sustained agricultural production. They know which local

crop species can be planted, how to plant, when, on what kind of soil, and etc. They traditionally practice mixed and intercropping as strategies for diversifying and spreading harvests, ensuring food security, protecting soil and saving moisture.

These locally and other externally generated knowledge are disseminated through farmer-to-farmer interaction. Public institutions, particularly the *"Network"*, and maybe other community institutions such as *Mahbers* and *Senbetes* play an important role in this regard. As noted in an interview, member in these institutions, especially members of a *"Network"* exchange and share information, knowledge, agricultural equipment, materials such as seed, inputs and facilities for transporting agricultural produce to market. They also consult each other about the problems they encounter.

4.2.2.6 Adequate Financial and Human resources

Assigning sufficient financial and human resource is another key factor that affects the success of the collaboration. In the study areas, the institutions ability to help households is constrained as a result of the limited financial resources and human capacities for making informed decisions and for implementing their decisions. Limited human capacity and resource of the institutions is particularly distressing climate adaptation because climate impacts are often unpredictable. An appropriate response to such unpredictability requires resource and capacity for coordination and collaboration of the relevant actors. However, it is observed that the local institutions across the public and community sectors are underfunded that they lack the resources and skilled human power to carry out their activities in a collaborative way.

In general, almost all of the earlier discussions have focused on the collaborations with in the formal institutions. In the study *tabias,* collaborations between the public institutions and the informal community institutions particularly with those initiated and administered by the community themselves such as religious institutions, *Idirs* and *Uqubs* are almost non-existent. Whilst religious leaders given a great respect in the study area, in other words, whilst religious beliefs and practices are a core part of the *woreda's* culture and value system, they have not translated into a wider demand for adaptation practices as no collaboration is existed. Rather church in the study areas are continued to put restrictions on when farmers

can work in their fields including in a peak farming periods. In such a situation, it can have harmful effects on livelihood outcomes, particularly during times of recurrent drought.

Similarly, no collaboration is existed between *Idirs* in the study *tabias* and government institutions or local NGO's. Concerning the reason for the non-existence of collaboration, an interview with leader of *Dedebit* Microfinance notes *"We encourage people to save in our microfinance,* added, *in some cases decision making in Idirs or Uqubs is not transparent to members and even become a source of conflict across the members. Today, we (the microfinance) are accessible up to tabia level. If farmers save their money in our institution, they will obtain an interest, they can take their money at any time, and their money will also become free from any kind of risks".* Most of the interviewed *Idir* representatives on the other hand expressed as they haven't had the skills of working together and the initiative and knowledge of working together with the government institutions, Dedebit Microfinance or others.

Contrary to this, literature suggested that there have been successes in community-based saving institutions in many other countries. It is showed that these successful institutions generally received external technical assistance to guide their management structure and operational procedures. Even in our country, as indicated in Pratt and Earle (2004), an INGO, named as ACCORD, began working with *Idirs* in Dire Dawe in 1995 seeing the advantages of a working partnership with a self-initiated, mutual-support organization based on strong social cohesion. A major component of the program was the provision of a grant that serves as a revolving credit fund to support community or individual income-generating activities. This is supported by training to *Idir* members and the facilitation of links between *Idirs* and other development actors.

As an outcome, an evaluation assessed that, more than half of the very poor members had engaged in at least one income-generating activity and 42 percent of those who had previously been in the poor category had attained middle status. Through the credit facilities managed through the *Idirs,* a substantial number of members are said to have improved their incomes. Community projects implemented included bridges, water supply, and the provision of electricity, a flour mill and renovation of schools. Through the support

provided and experience gained over a variety of initiatives, in some cases, the structure of the *Idirs* has evolved to better meet their new roles with posts of treasurers, secretaries and accounts being created.

In the study area, the informal community institutions like *Idir* and *Uqub* are less considered by the formal system as a means to help farmers to adapt to climate variability impacts. A reason may be is that, there is lack of clarity around issues relating to the extent of informal community institutions' power within the formal system. This lack of clarity prevents an enabling environment in which the local government institutions and the microfinance are confident to partner the *Idirs* and related informal community institutions. The following section describes more factors constraining to institutional collaboration in *Mereb Leke woreda.*

4.3 Factors Constraining to Institutional Collaboration in *Mereb Leke Woreda*

As it has been described before, the extent of collaboration among local stakeholder institutions in *Mereb Leke woreda,* particularly between the formal and informal institutions is limited. Various representatives of formal and informal institutions including the NGO's, public sector institutions and community institutions mentioned a number of challenges to institutional collaboration, and elaborated major bottlenecks in the implementation of their tasks in a collaborated way.

4.3.1 Institutions in the Woreda Face Financial Constraints

Most of the described local stakeholder institutions play an important role in adaptation to climate variability impacts. Irrespective of their limitations and inadequacies, they assist with more day-to-day needs such as those related to training and guidance, infrastructure development, provision of agricultural inputs and loans. Despite the critical role of these institutions in supporting adaptation to climate stresses, most have limited resources at best. Hence, their ability to help households is constrained as a result of the limited financial resources and capacities for making informed decisions and for implementing their decisions. Limited capacity and resource of the institutions is particularly distressing climate adaptation because climate impacts are often unpredictable. An appropriate response to such unpredictability requires resource and capacity for coordination and collaboration of the relevant actors.

Although the *woreda* administrator office, maybe, is officially responsible for coordinating activities at the *woreda* level, it has been noted that it is so underfunded that it lack the resources and power to carry out its responsibilities. Many have pointed to the need for more collaboration than currently exists. But its absence seemed due to the issue that such collaboration is costly; as a key informant in *Rama,* the administrative center of the *woreda,* expressed as *"Collaboration is costly in terms of setting up arrangements that permit information sharing and promote interactions among the stakeholder institutions in our woreda. It is also costly in terms of material resources needed to promote it".* Similarly, at community level, discussants of Women's Association in *Awet tabia,* pointed out that their association has no resources to improve the plight of the poor in collaboration with other stakeholder institutions, except simple focus on women's rights in words. Therefore, though the outcomes of collaboration decision making and information sharing might be positive to adapt the climate variability in the *woreda,* it is not very visible in practice, particularly between the formal and informal institutions, may be, due to the likely costs they entail.

4.3.2 Institutions in the *Woreda* Face Technical Constraints

"We haven't had the skills of working together and the knowledge of working together." This is a direct quote of an interview with member of an *Iddir* in *Wedihazo tabia.* Collaborative work requires skills and trust gained over time and through collaborative experience. In the collaboration literature, there is an assumption that information exchange, coordination and interaction take place in 'environments' where information is shared. Such 'environments', however, have to be created and developed. The quote indicated above illustrate that in the study area such an 'environment' with the attendant skills and trust is not yet developed.

4.3.3 Top-down Administrative Culture as a Challenge

The top-down administrative culture still remained prevalent in the study *woreda.* In most cases, it was observed that some of the *tabia* level public institutions were largely dependent on the vertical linkages with their respective *woreda* offices. Including those local NGOs are intimately linked to formal *woreda* government offices, with no real powers conferred on the *tabia* and community institutions. Hence, *tabia* level and community institutions in the *woreda* are, in many cases, events of top-down information dissemination. In this regard, several key informants acting as the representatives of agricultural extension service

providers at *tabia* level pointed out that they perceive the top-down linkages as a single concept of collaboration. Various informal discussions with informants during interviews also revealed that the existed linkages tend to be top-down.

4.3.4 Lack of Facilitator and Clear Regulation on Collaboration

There observes lack of institution which facilitates collaboration. The collective committee named as *task force,* having members only from some *woreda* level public institutions and the NGO's, missed *tabia* level institutions and informal community institutions which are important. Hence, there is a need of facilitator institution which brings all the relevant stakeholders to a table, communicate more effectively, and reach in a mutually agreeable solution. Facilitated dialogue, regulated negotiations, traditional mediation and in turn, successful adaptation to the adverse impacts of climate variability might not be achieved when the necessary level of participation by relevant stakeholders including *tabia* level institutions and informal community institutions does not exist in the *task force.* The presence of a facilitator institution and clear regulation can play an important role in a collaboration process. It can encourage the participation of government or private sector institutions, and informal community institutions that, some of them, stand back from a collaboration process.

4.3.5 Institutions in the Woreda Face Rapid Staff Turnover

Public institutions in the *woreda*, including the *woreda's* administrative office, faced a rapid staff turnover. Among many other factors, many mentioned that this rapid staff turnover is mainly attributed to the *kolla* nature of the area. *"It is kolla and no incentive is given to the civil servants as of the kolla woredas in the region"* an interviewee. Looking this from the context of challenges to institutional collaboration in the *woreda,* experienced staff or a person worked for a long period of time in the place could have better opportunity to contact with the community institutions, better acceptability by the public, better capacity, skill and knowledge, in which most of the existed staffs lacked.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Collaboration of local stakeholder institutions can mostly be needed in *Mereb Leke woreda* where the threat of climate variability has been exacerbated by problems such as land fragmentation, landlessness, soil erosion, deforestation, inflation, difficulties of transportation due to rugged terrains, limited off-farm income, peace instability, and at large limited capacities to adapt.

After all, the study looked into the institutional setup of the area under which farmers have contacts with and those that have been helpful or influential in climate adaptation. Several types of institutions: government and local government agencies, NGOs, cooperatives, associations, religious institutions, and informal village groups were found to be operating in the area. The institutional assessment found that the institutions operating in the study area have differences both in roles, capacities and influences to deal with climatic risks. Concerned *woreda* level government offices were found officially there but it emerged from the discussion with the local people that the access to market, climate information, and solutions for crop diseases and pests remained as critical institutional inadequacies in the area.

As far as collaboration is concerned, the existed institutional collaboration tends to be emphasized only between the public sector institutions and the local NGO's (the Relief Society of Tigray (REST) and *Dedebit* microfinance). Although the w*oreda* level public sector institutions have formal written collaboration agreements and a collective committee, it is found that the agreements and the committee is more with institutions with whom they have common areas of interest. Moreover, the agreements as well as the committee missed *tabia* level institutions and informal community institutions which have an immense role to facilitate development at the local level. *Tabia* level public institutions were largely dependent on the vertical linkages with their respective *woreda* offices, with no real powers conferred on them. Hence, grass root level actors, *tabia* level and some community institutions are, in many cases, events of top-down information dissemination. In particular,

informal community institutions such as the religious institutions and *Idirs* are non-connected to the public sector institutions or NGO's on issues of climate adaptation.

To conclude, depth of collaborative experiences and culture amongst local stakeholder institutions in adapting climate variability impacts in *Mereb Leke Woreda,* particularly between the formal and informal institutions is limited. Collaborative work requires skills and trust gained over time and through collaborative experience. It is noted on the collaboration literature that information exchange, coordination and interaction take place in situations where information is shared, shared mental model and trust across institutions is developed. Such situations need to be created and developed within the *woredas* public, private and civic including those informal community institutions. The data shows us that in *Mereb Leke* such a situation with the required skills and trust is not yet been developed. Lack of finance, lack of skills and capacities, top-down administrative culture, rapid staff turnover, and lack of facilitator and clear regulation on collaboration has been found as major constraints to institutional collaboration in the *woreda.*

5.2 Recommendations

Based on the results obtained from the study, the following points are recommended:

- Successful adaptation to climatic variations needs a greater community level awareness, understanding of the risk itself and the need of advance planning. The level of awareness towards planned adaptation to climate variability can be developed by collaborating and channeling awareness and motivational programs through the various institutions operating at *woreda*, *tabia* and community level. In addition to the institutions operating at field level such as the ARDO and health office, other institutions associated with education, religion and other informal traditional saving groups can be used at grass root level for creating necessary awareness and campaign for climatic risks management. They would successfully be utilized for reaching the awareness up to the very community and household level. For doing that, it is important to consider the following three sub-points.

- A good understanding of the institutions, the context in which they operate and their current and historical role is necessary to recognize their advantage. The advantages of collaborating with indigenous institutions could be many, as they have channels of communications frequently inaccessible to others, as they are stable using socially embedded structures that have been tested over many years, and as they are understood and trusted by communities.
- Training and follow-up could be an important entry point for both formal and informal institutions. Where training topics are of relevance to representatives of both formal and informal institutions, joint training could not only increase capacity but also enhance a shared language and facilitate exchange.
- Regular information exchanges over issues that are important to the community, between government officials and traditional leaders would highlight further entry points where collaboration is to mutual benefit. To build trust such encounters has to be through structures that are meaningful to the area rather than necessarily attempting to formally incorporate them into government structures.

In doing so, churches and other informal community institutions can be used as centers for the dissemination of knowledge, information and as a vehicle for reaching a wider audience in the extension messages. Such an intervention has to be adopted, with the effect of empowering people to protect their assets and reinforce their livelihood security in the face of increasing rainfall variability.

- Other places and countries have seen success in community-based savings institutions as the institutions received external technical assistance to guide their management structure and operational procedures. In *Mereb Leke* it would be worthwhile to strengthen existing institutions through training and encourage the introduction of new savings associations in the communities where *Uqub* are no longer part of the culture. This could generate asset that can strengthen household resilience to a number of potential hazards.

- Development of the required infrastructures and institutions such as roads, electricity, markets. Creating market opportunity for irrigation and other related products and creating value adding activities such as encouraging the establishment of agro-processing in the area is of paramount importance.

- Overcoming all the constraints to institutional collaboration in the *woreda* is not something that can be achieved at once. It is likely to require substantial time as well as investments that show the benefits of such collaboration and also reduce the costs. The development of a facilitator institution, formulation of collaboration regulations and initiatives, improved information provision about climate threats and impacts, and provision of added material resources are all likely to be necessary to support greater interaction, coordination of decisions, and sharing of information about activities being undertaken by the different institutions.

- Along with the above stated recommendations, as an immediate action, experience sharing from other *woredas* especially from those drought prone *woredas* of Eastern Tigray is essential.

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APPENDICES

A. Key informants – Woreda Professionals

a. Name of the Interviewee: ----------

b. Position: ----------

c. Date of the Interview: ----------

List of Questions

1. Tell me the trends of climate variability and drought in the *woreda?*
2. Tell me what activities are undertaking by stakeholder institutions to improve the ability of farmers to climate variability impacts? By whose institutions?
3. Tell me the list of government offices, agencies, NGO's and others (if any) which have relevancy to climate adaptation?
4. Tell me if there are protocols, formal or informal rules that intend collaboration of institutions or bureaus in adapting climate variability?
5. What collaboration mechanisms and processes currently exist? Amongst *Woreda* relevant offices, NGOs, *Tabia* level formal and informal institutions? In what areas?
6. How effective are they? Why?
7. Tell me if there are barriers that limit collaboration of stakeholder institutions?
8. What do you think their causes?

B. Key informants - community elderly

a. **Name of the Interviewee:** ----------

b. **Age:** ----------

c. **Date of the Interview:** ----------

List of Questions

1. Tell me the trends of climate variability and drought in your area?
2. Tell me what major adaptation measures are undertaken in your area?
3. Tell if there are supports of adaptation options for drought provided?
4. What kind of support?
5. By which institutions?
6. Are there institutions in your village that are indigenous, initiated and administered by the community themselves?
7. What is the role of these institutions in helping farmers to improve their livelihoods and adapt climate variability impacts?
8. Have these institutions ever shared information, resource, or any other experiences with the government institutions at tabia or woreda level?

C. FGDS

a. **Name of participants**.....
b. **Date of the Discussion**.....
c. **Place of the Discussion**.....

A Discussion Guide

- Environment History
    - Drought trends
    - Land use and land cover changes
    - Changes in vegetation, soils, and water resources
- Major adaptive practices/responses against climate variability
- Available types of support of adaptive options for drought
    - Access to Aid
    - Access to Credit
    - Access to Market
    - Access to Agricultural Inputs
    - Access to Information
    - Others
- Name and description of the institutions providing support to adapt drought
    - Local government institutions
    - Extension agencies
    - NGOs
    - Cooperatives
    - Religious institutions
    - Informal village groups
    - Private businesses
    - Others (if)
- Capacities of institutions providing support
- Linkages of the institutions with one another
- Major bottlenecks, opportunities and suggestions to develop institutional performances and collaborations in adaptive responses

D. Semi-structured Interview with leaders and members of institutions

d. **Name of the Institution: ----------**

e. **Name of the Interviewee: ----------**

f. **Position on the institution: ----------**

g. **Date of the Interview: ----------**

List of Questions

No	List of Questions
1	Tell me about this institution: How long has it been operating, how and why it started, its purpose, its history, its structure.
2	Since its beginning what sort of activities has the institution been involved with or initiated?
3	Does your institution undertake activities for counteracting the effects of climate variability?
5	What tools (e.g. strategies, problem solving approaches, means of communication etc.) are used?
6	Does your organization have further plans to facilitate adaptation to climate change?
7	What is your institution's understanding on collaboration with other institutions?
8	Do you think this is an issue for the institution? Why?
9	Does your institution have collaboration with other institutions? With whom? And on what?
10	What protocols, formal or informal rules does your institution have for working in collaboration with other institutions (formal or informal)?
11	Tell me about the institution's experiences and discussions that had (if) about how the institution would work collaboratively with other institutions.
12	What was the outcome? What does your institution think about the outcome?

13	Tell me if there were perspectives differences amongst? What differences? With whom? Why?
14	Are there institutions (formal or informal) countering with your institutions' objective?
15	Tell me if there are challenges that limit institutional collaboration?
16	What shared tools (for example mental models such as ways of thinking, dialogues and discussions about an issue, physical tools) are used? How and why they are used?
17	What collaboration mechanisms and processes currently exist? In what areas? How effective are they? Why?
18	What would your institution do differently next time?