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University College Cork, Ireland
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Analysis of Institutional Arrangements and Common Pool Resources Governance:

The case of Lake Tana Sub-Basin, Ethiopia.



A thesis Presented to

The Department of Food Business and Development
National University of Ireland, Cork.

In Fulfillment of the Requirement for the Degree of
Doctor of Philosophy (PhD)

By

Dessalegn Molla Ketema
(December, 2013)

Head of Department**:** **Professor Michal Ward (PhD)**
Research Supervisors**:** **Nicholas G. Chisholm (PhD)**
Patrick Enright (PhD)

Dedicated

to

My Mom Yelfign Derbew Wahel

DECLARATION

I, the undersigned, declare that the dissertation hereby submitted by me for the PhD Degree in Rural Development at the University College Cork (UCC) is my own independent work that, to the best of my knowledge and belief, has not previously been submitted by me or somebody else at another university. All sources of materials used for this dissertation have been duly acknowledged.

Dessalegn M. Ketema

Signature: _____

Place: _____

Date of Submission: _____

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Dessalegn M. Ketema

Cork-Ireland, 2013

ABSTRACT

Although Common Pool Resources (CPRs) make up a significant share of total income for rural households in Ethiopia and elsewhere in developing world, limited access to these resources and environmental degradation threaten local livelihoods. As a result, the issues of management, governance of CPRs and how to prevent their over-exploitation are of great importance for development policy. This study examines the current state and dynamics of CPRs and overall resource governance system of the Lake *Tana* sub-basin. This research employed the modified Institutional Analysis and Development (IAD) framework. The framework integrates the concept of Socio-ecological Systems and Interactive Governance perspectives where social actors, institutions, the politico-economic context, discourses and ecological features across governance and government levels were considered. It has been observed that overexploitation, degradation and encroachment of CPRs have increased dramatically and this threatens the sustainability of Lake *Tana* ecosystem. The stakeholder analysis result reveals that there are multiple stakeholders with diverse interest in and power over CPRs that often lead to competition and conflict. Local community, private investors, governmental, non-governmental, national and international stakeholders are engaged in the process of resource use, management and governance. The analysis of institutional arrangements reveals that the existing formal rules and regulations governing access to and control over CPRs could not be implemented and were not effective to legally bind and govern CPR user's behavior at the operational level. The study also shows that a top-down and non-participatory policy formulation, law and decision making process that overlooks the local contexts (local knowledge and informal institutions) fails to understand the diverse, dynamic, complex and sensitive nature of the natural and human sub-systems. The outcomes of examining the participation of local resource users, as an alternative to a centralized, command-and-control, and hierarchical approach to resource management and governance, have called for a fundamental shift in CPR use, management and governance to facilitate the participation of stakeholders in decision-making. Therefore, establishing a multi-level stakeholder governance system as an institutional structure and process is necessary to sustain stakeholder participation in decision-making regarding CPR use, management and governance.

Keywords: Common pool resource, governance, institutional arrangement, stakeholder, Lake *Tana*, Ethiopia.

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ACRONYMS AND ABBREVIATIONS

ACP	African Caribbean and Pacific group of States
ADLI	Agricultural Development Led-Industrialization
ANRS	*Amhara* National Regional State
BoA	Bureau of Agriculture
Bo-EPLUA	Bureau of Environmental Protection and Land Use Administration
CIA	Central Intelligence Agency of the United States of America
COPs	Conferences the Contracting Parties to the Convention
CPRs	Common-Pool Resources
CRGE	Climate Resilient Green Economy Strategy
CSA	Central Statistics Agency of Ethiopia
EEPCo	Ethiopian Electric Power Corporation
EPA	Environmental Protection Authority
EPRDF	Ethiopian People's Revolutionary Democratic Front
EWNRA	Ethio-Wetland and Natural Resource Association
FAO	Food and Agriculture Organization of the United Nations
FDRE	Federal Democratic Republic of Ethiopia
GDP	Gross- Domestic Product
GEF	Global Environment Facility
GTP	Growth and Transformation Plan
IAD	Institutional Analysis and Development
IBCR	Institute of Biodiversity Conservation and Research
IPMS	Improving of Productivity and Market Access of Small Farmers
Km	Kilometer
MDGs	Millennium Development Goals
MoA	Ministry of Agriculture
MoWE	Ministry of Water and Energy
MW	Mega Watt
NBI	Nile Basin Initiative
NEPAD	New Partnership for Africa's Development
NGOs	Non-Governmental organizations
PRA	Participatory Rural Appraisal
SMEC	Snowy Mountains Engineering Corporation
SWOT	Strength Weakness Opportunity Threat
TEK	Traditional Ecological Knowledge
USD	United States Dollar
UNESCO	United Nations Educational, Scientific and Cultural Organization

GLOSSARY: DEFINITIONS OF LOCAL TERMS

Expression in English	Language		Explanation
Birr	ብር	Amharic	Ethiopian Currency, Approx. 24.45 *Birr* is equivalent to 1 Euro (as of July 11, 2013)
Dek	ደቅ	Amharic	An island in Lake *Tana* on which about 10,000 people are residing.
Derg	ደርግ	Amharic	The short name of a committee of military junta which ruled Ethiopia from 1974 until 1991 and overthrown by EPRDF.
Equb	'እቁቡ'/ 'ቁቡ'	Amharic	A rotating credit association in which each of its members contributes money periodically and the amount collected at each period is provided to one of the members often on a lottery system
Edir	እድር	Amharic	*Edir* is a traditional community organization in different parts of Ethiopia whose members assist each other during the mourning process.
Gubbo	ጉቦ	Amharic	is a local Amharic term to mean 'a gift for someone, in exchange for doing something special' equivalent to English word corruption' or 'bribery'
kebele	ቀበሌ	Amharic	The lowest administrative unit in Ethiopia
Negede woyto	ነገደ-ወይጦ	Amharic	This tribe is among the poorest section of the society in *Amhara* National Regional State and they are believed to be indigenous people in the Southern tip of Lake *Tana* who were fisher and hunter men.
'Tana biderk eske dek'	'ጣና ቢደርቅ እስከ ደቅ'	Amharic	It is a motto mostly said by local farmers who live and owned farmland around the shore of Lake *Tana*. It is to mean 'if *Tana* dry, we will plough up to *Dek* Island'.
Wereda	ወረዳ	Amharic	Administrative unit that comprises several *kebeles* equivalent to English word ' district'
Ye giligil Shimagile	የግልግል ሽማግሌ	Amharic	The village elders who are old enough and respected to settle disputes in their village

Publications and public presentations

During the course of this research project, a number of public presentations have been made which are based on the work presented in this dissertation. They are listed here for reference.

Journal Article

- **Ketema D.M.**, Chisholm N. & Enright P. (2011) 'Putting research knowledge into Action: The missing link for sustainability of Lake *Tana* Ecosystem, Ethiopia'. *Ethiopian e-Journal for Research and Innovation Foresight (Ee-JRIF)*, Vol 3, No. 2 2011-Special issue on Knowledge Exchange: pp (4-19). Available at: http://www.nesglobal.org/eejrif4/index.php?journal=admin&page=article&op=view&path%5B%5D=64&path%5B%5D=170

Paper presented in Conference/symposium/ Workshop/PhD School

- **Ketema D.M.,** Chisholm N. & Enright P. (2010) Challenges and Prospects of Common-Pool Resource governance in Lake *Tana* watershed: An overview. *The 11th Symposium on Sustainable Water Resource Development*. December 3-4, 2010. Arbaminch University, Ethiopia.

- **Ketema D.M.,** Chisholm N. & Enright P. (2011) Analyzing Multi-Stakeholder Interactions in Common-Pool Resources Governance: The Case of Lake *Tana* watershed, Ethiopia. Paper presented in '*The 7th International PhD School on National Systems of Innovation and Economic Development', GLOBELICS academy*. May 16-26, 2011. Tampere, Finland. (Certificate Awarded). Available at: http://www.globelicsacademy.org/2011_pdf/Ketema%20Dessalegn%20Molla.pdf

- **Ketema D.M**. (2012) Stakeholder Identification and Analysis of wetland resources. *A National Workshop on Awareness creation and Hands-on Training under the theme of 'Wetlands for Sustainable Development and Climate Change Mitigation'*. Organized by *Bahir Dar* University in Collaboration with Addis Ababa University, January 25-27, 2012. *Bahir Dar*, Ethiopia. (Certificate Awarded).

CHAPTER ONE

1. INTRODUCTION

1.1 Background of the Study

A large proportion of the poorest rural households in Asia, Africa, and Latin America depend critically on common-pool resources (CPRs hereafter)-such as forests, wetlands, fisheries, and rangelands-for their food, livelihood and make up a significant share of total income (Ratner, 2011, Kemekes, 2012). As a result, the issues of management, governance of CPRs and how to prevent their over-exploitation as population grows are of great importance for development policy (Wade, 1987). Particularly in sub-Saharan Africa, all types of land based livelihoods are constrained by a combination of population pressures, land shortages and resource constraints (Andrew *et al*. 2003) that ultimately can lead to conflict over resources.

The problem is even worse in Ethiopia, where it is quite a common phenomenon to experience a recurrent drought, resource depletion and degradation accompanied by a dramatic population increase. According to the Central Statistical Agency (CSA) the Ethiopian population is estimated to be 84,320, 987 (CSA, July 1, 2012 est.), whereas the Central Intelligence Agency (CIA) of the United States population projection estimates the population of Ethiopia to be 93,815,992 (July, 2012 est.), which would make Ethiopia the second most populous country in Africa and the 13th in the world. With a population annual growth rate of 3.179 % Ethiopia also ranked 5th in the world in terms of growth rate (July, 2012 est).

The country exhibits one of the lowest rates of urbanization where only 15% of the population dwells in urban centers. The remaining 85% of the population resides in rural areas engaged in subsistence agriculture. As a result, arable land per household and access to CPRs is decreasing making the land based resource issue critical. Average land size holding in the country remains at about 1 hectare per household. This is equivalent to a mere 0.2 hectare per head with an average rural household size of 5, which is mostly used for staple crop production (CSA, 2005).

Population pressure combined with other socio-economic factors cause environmental scarcity that denotes the social effects of the combined impacts of i) *environmental degradation* shrinking the total size of an imagined environmental 'resource pie', e.g. arable land, wetland, aquifer; ii) *population increase* shrinking the size of the equitably allotted 'slices' of the resource pie; and iii) *unequal resource access* allowing powerful segments of the population to access inequitably large amounts of resource slices in a process of 'resource capture'. This results in ecological marginalization and loss of livelihoods for large but weaker groups of the population which inherently causes conflict over resources (Ohlsson, 2000).

The consequences of these environmental scarcities, degradation, depletion in the north and central parts of Ethiopia, which includes major parts of the *Amhara* region, have caused stagnation in agriculture, an ever decreasing amount of land per capita for cultivation and livestock production, degrading CPRs, and less income for the rural and urban community. On the other hand almost all the rural population-and many urban people too- are CPR users in one way or another (IFAD, 1995; Sapkota and Oden, 2008). Particularly rural households are highly dependent on CPRs for their livelihood. Common-pool resources are usually characterized by (a) multiple use values, such as consumptive, recreational, environmental and spiritual (Baland and Platteau, 1999) and (b) multiple users with different powers and interests. When resource units are highly valued and many stakeholders benefit from harvesting them for consumption, exchange, or as a factor in a production process, the harvests made by one individual or actor are likely to create negative externalities for others (Ostrom, 2008).

Therefore, this dependence and diverse use pattern of CPRs have become an important topical issue in developing economies like Ethiopia (IFAD, 1995, Sapkota and Oden, 2008). Any degradation of CPRs will have an adverse impact on rural livelihoods, particularly of the poor. Environmental degradation through reduction of common property resources decreases earnings of the rural mass. This deterioration of resources increases the incidence of poverty, as these poor are exclusively dependent on the stock of natural resources (Mahanta and Das, 2012).

This thesis therefore explores the CPR governance and institutional arrangements in Lake *Tana* sub-basin of *Amhara* Region, Northern Ethiopia. Common-pool resource governance is a challenge to the resource users as well as for those who have a stake in the CPR governance system, particularly under conditions of change and resource pressure. These resources may be governed and managed by a wide variety of institutional arrangements that can be roughly grouped as governmental ownership, private ownership or community ownership. In recent times, a considerable number of CPRs are co-managed by communities working with governments (Ostrom, 2008).

In this regard, to design an improved natural resource governance and management system for a local context, a detailed analysis of the existing, emerging and proposed socio-economic, socio-political and institutional factors is a prerequisite. However, previous analysis of institutions related to natural resource management in the study area normally focused only on national or regional mechanisms and programmes in place. Even though it is accepted that these programmes contribute significantly to natural resource management, the role of institutional arrangements and governance regimes at local/user level cannot be ignored. Several recent and ongoing research initiatives have dealt in one way or another with the biological, hydrological and environmental aspects of Lake *Tana* sub-basin, but they were inadequate to illustrate the human-nature interaction and the trends in resource degradation, and to anticipate possible solutions especially in reference to institutional arrangements and natural resource governance at local/user level. Therefore, this research is designed to critically analyze and understand the institutions that govern the CPRs, local community[1] and the roles, responsibilities and interaction of stakeholders in conflicting or cooperative situations.

[1] Local community- is understood in this thesis as a local unit of actors using or making decisions over Common pool resources (CPRs). It is not necessary a homogeneous group with similar interests and objectives (Clement, 2010).

1.2 Problem Statement

Lake *Tana,* located in north-west Ethiopia, is the second largest freshwater lake in Africa. It accounts for 50 per cent of the total inland water area of Ethiopia and feeds the Blue Nile River, which contributes about 85 per cent to the total flow of water in the Nile. However, recent developments in the region around the lake, and particularly around *Bahar Dar*, a rapidly growing town on the southern shores of the lake, have cast doubt on the sustainability of the use value of the lake in general and in relation to fish and wetlands resources in particular (Berhanu *et al*. 2001). Thus, it is possible that degradation of the aquatic ecosystem could go unnoticed and eventually bring disastrous effects on the Lake *Tana* ecosystem and the livelihoods of the local community (Miheret and Tollner, 2009).

The main characteristic of Lake Ecosystem landscapes is that they contain resource systems with multiple-use value and which are used by multiple actors. The relationship between these dynamic and diverse landscapes (multiple use) and the differentiated users (multiple users) can be analyzed and understood through how different stakeholders satisfy their needs and local people derive their livelihoods by having legitimate control over resources (Leach *et al*. 1999).

When resource users interact without effective institutional arrangements limiting access and defining rights and duties, two potential CPR dilemmas are likely to happen; over use without concern for the negative effect on the others, and lack of contribution or incentive to maintain and improve the CPR itself (Ostrom, 1999). Principally, common-pool resources in and around Lake *Tana* share with public goods, the difficulty of developing physical or institutional means of excluding beneficiaries; therefore it is hardly possible to manage these resources among user groups in a sustainable manner. If exclusion is physically difficult and effective rules are not in place to limit who can use a resource and what can be withdrawn from it, then all harvesters face an incentive to increase their own harvesting rate without any concern for the impact of their actions on the costs for others (and eventually for themselves)(National Research Council, 2002). Second, the products or resource units from CPRs share with private goods the attribute that one person's consumption subtracts from the quantity available to others (Ostrom, 2000).

The non-excludability and subtractability nature of CPRs coupled with environmental changes, population pressure, and the subsequent demand for more resources to sustain rural livelihoods, result in CPRs now being under severe threat in Ethiopia in general and Lake *Tana* sub-basin in particular. Unless harvesting or use limits are devised and enforced, CPRs in the sub-basin are potentially subject to problems of congestion, over-exploitation, depletion or degradation. On the other hand, when the multi-purpose values of Lake *Tana* are considered, there are conflicts arising from different stakeholders exploiting resources for various goals. In the context of environmental changes and livelihood dynamics, stakeholders tend to explore and capture resources for survival and/or for additional benefit in different ways. Unless means are devised to keep non-authorized users from benefiting, the strong temptation to free ride on the efforts of others will lead to a suboptimal investment in improving the resource, monitoring use, and sanctioning rule-breaking behavior (Ostrom, 2000).

However, despite a general natural resource management framework, there is no specific policy framework that addresses the CPR dilemma in the sub-basin. Also the existing general policies are not developed and implemented in such a way that resource user and other relevant stakeholders are involved at all stages of the policy making and implementation process. Resource user groups and other stakeholders in the study area have been confronted with a broad array of resource governance problems in the past two decades. Lake *Tana* is in a state of emergency where different development pressures and resource degradation cast doubt on the sustainability of the Lake ecosystem. Stakeholders are in a continuous debate on resource management and governance.

Concerning Lake *Tana*, despite some analysis of institutional arrangements of the Nile Basin at Federal and sub-regional level, the extent to which existing laws, polices, programs and regulations devolved to the lowest level, may constrain or aid the development and implementation of natural resources management and governance at local/user level is not well known. Particularly, governance in relation to CPRs and the Lake *Tana* environment is relatively less explored and understood. Institutional mechanisms for managing across Lake *Tana* jurisdictions under the CPR governance are largely unknown.

Analyzing and understanding of the common causes of conflict in CPR use and governance systems can help one succeed in overcoming the destructive effects of unresolved CPR conflict in the sub-basin. It is therefore important to identify and understand the institutional arrangements and CPR governance regimes, the factors that favour or retard the development and effectiveness of local institutions and organizations. However, to date there is insufficient evidence regarding the nature and type of local level institutional arrangements and organizations for CPR governance in particular for fisheries and wetland. More generally, since CPR management and governance is likely to be context specific; there is need for more research in Ethiopia in general and Lake *Tana* sub-basin in particular. Therefore, the present research is conducted to reveal the institutional arrangements and CPR governance systems in developing the strategies of improved and sustainable CPR governance and management systems. This research also focuses on the multiple and overlapping nature of resource users, governance structures and specific challenges created by these multiple use value-multiple actors in Lake *Tana* sub-basin.

Generally, research approaches and empirical studies on CPR in Ethiopia and elsewhere in Africa are largely comprised of case studies or synthesis across disparate resources focusing on a single resource systems (such as grazing/range lands, irrigation systems, forest etc[2].) without considering their interrelationships and complexity of the broader system while a holistic-systemic approach to problem solving, especially for large-scale and complex socioeconomic problems (Haimes, 1992) is vital to better understand the whole system. Therefore this study aims to address the complex nature of the Lake *Tana* ecosystem from the complex system thinking perspectives where dynamic patterns of interactions between human groups and their environment (social-ecological systems) are arranged in a nested series of tiers (McGinnis, 2011).

[2] See for example; Ashenafi and Leader-Williams, 2005; Stellmacher, 2007; Wondie, 2010; Atnafu *et al*. 2011; Awulachew *et al*. 2009.

1.3 Objectives of the study

The general objective of the study is to investigate the current state and dynamics of CPRs, overall institutional environment, common-pool resource governance system and multi-stakeholder interactions of Lake Tana sub-basin in the context of sustainability and environmental changes. The main hypothesis for this research is that the Lake *Tana* ecosystem, particularly CPRs (water, fish and wetlands), is under severe challenge and the existing institutional arrangements that are supposed to govern the CPRs are not effective to protect the Lake ecosystems from overutilization and degradation. Although proclamations and legislations to manage and govern natural resources are enacted at constitutional level, due to weak enforcement mechanisms and the lack of key stakeholders' involvement and coordination, these rules and regulations are not put in place at user level.

The specific objectives of the study are:

- To analyze the current state and dynamics of CPRs and its policy implication for livelihood security and sustainable CPR use, management and governance.

- To explore the drivers of change that affect CPR use, management and governance and the roles of key players in the process of CPR use, management and governance.

- To identify the causes and management of conflict among stakeholders over CPRs at different scales.

- To describe the existing institutional arrangements and identify factors influencing their effectiveness to govern the behavior of CPR users.

1.4 Research Questions

This study seeks to identify the trends in conditions and describe the pressures being exerted on Lake *Tana* environment in general and CPRs in particular. In addition, the research seeks to understand how CPR institutions are devolved from the constitutional level to operational level to govern the behaviors' of resource users and other stakeholders in efficient use, equitable allocation, and sustainable conservation of resources. The study specifically addresses the following questions;

- What are the current states and dynamics of CPRs and what are the policy implication for livelihood security and sustainable CPR use, management and governance?

- What are the drivers of change that affect CPR use, management and governance?

- Who are the key players in the process of CPR use, management and governance and what are their interests and power over CPRs?

- Why do conflicts arise around CPR use, management and governance and what are the underlying causes of conflict and resolution mechanisms?

- What are the existing institutional arrangements that govern the behavior of CPR users and what are the factors influencing the effectiveness of CPR management and governance system?

1.5 Outline of the Dissertation

This dissertation is organized into eight main chapters. **Chapter one** is the introduction to the dissertation, which presents the overall context of the research, the research problems and the key research questions and objectives to be addressed. **Chapter two** describes the theoretical and conceptual framework of the research. The subsequent sections of this chapter explicitly discuss the concepts and definitions used in this research and elucidate the theoretical background of the research framework. The theoretical framework provides a general structure that can hold or support a theory of the research and it represents the theory which explains why the problem under study exists. The conceptual framework outlines the specific direction by which this research has been undertaken.

Chapter three elucidates the research methodology of the dissertation. It describes and summarizes the study area, research design, sampling design and technique, data collection and analysis methods. **Chapter four** looks at the state of Lake *Tana* ecosystem (the natural 'sub-system-to-be governed') from the interactive governance perspective. The current state and dynamics of CPRs and the policy implications for livelihood and sustainable CPR use, management and governance are briefly discussed. **Chapter five** describes the human 'sub-system-to-be governed' where resources users and other stakeholders interact. The attributes of the community and other stakeholders, the drivers of change that affect CPR use and the governance system, the key players and their interactions in the process of CPR use, management and governance are discussed. **Chapter six** depicts the Ethiopian natural resource management and governance system which comprises the 'rules of the game' and the governance actors. The subsequent sections explain elements of the CPR governance system, the governing actors and the modes of CPR management and governance in Lake *Tana* sub-basin**.** **Chapter seven** on the other hand portrays the 'realities on the action situation' where the governance system interacts with the 'system-to-be governed'. It highlights the CPR management and governance situation, concerns and challenges, discusses the problems, identifies the missing link. Finally, **Chapter eight** summarizes the key findings of the dissertation, highlights theoretical and policy implications, puts forward recommendations, and discusses limitations and potential future research.

CHAPTER TWO

2. REVIEW OF THE LITERATURE

2.1 Introduction

This dissertation takes a holistic approach to the examination of institutional arrangements and common-pool resource governance of the complex Lake *Tana* ecosystem. As a result, many fields of research and various perspectives have been reviewed in the literature review. The major goal of this chapter is to describe the background and research that provide a conceptual and theoretical basis for the dissertation research. The chapter summarizes concepts and definitions related to the research questions and the problems concerning CPRs in Lake *Tana* ecosystem. The chapter starts with a very brief definition and description of institutions, organizations, institutional environment and institutional arrangements, strategies, norms and rules. More detailed discussions that address interactive governance theory, the theoretical debate on the 'commons' and empirical studies of CPRs in Global and Ethiopian context are presented. Finally, based on concepts and theories discussed, the conceptual framework that guides the roadmap to the dissertation research is presented.

2.2 Concepts and Definitions

2.2.1 Institutions and organization

There are endless disputes over the definitions of key terms such as institutions and organizations, which have led some writers to give up on matters of definition and to propose getting down to practical matters instead. But it is not possible to carry out any empirical or theoretical analysis of how institutions or organizations work without having some adequate conception of what an institution or an organization is (Hodgson and Calatrava, 2006).

As stated by North (1990), institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction. Institutions are made up of formal constraints (rules, laws and constitutions), informal constraints (norms of behavior, conventions, and self imposed codes of conduct), and their enforcement characteristics. Whereas organizations are made up of groups of individuals bound together by some common purpose to achieve certain objectives. If institutions are the rules of the game, organizations are the players. Hence it is the interaction between institutions and organizations that shapes the institutional evolution of an economy.

Knight (1992) specifies institutions as 'sets of rules that structure social interactions in particular ways'. These rules (1) provide information about how people are expected to act in particular situations, (2) can be recognized by social actors who are members of the relevant group as the rules to which others conform, and (3) structure the strategic choices of actors in such a way as to produce equilibrium outcomes. Aoki (2007) defines institutions as stable, shared systems of beliefs about the expected behavior of the members of a society in various contingencies.

Pahl-Wostl (2009) agreed with North's definition in which institutions do not refer to organizations or physical structures. Formal and informal refer to the nature of processes of development, codification, communication and enforcement. Formal institutions are linked to the official channels of governmental bureaucracies. They are codified in regulatory frameworks or any kind of legally binding documents. Correspondingly they can be enforced by legal procedures. Informal institutions refer to socially shared rules such as social or cultural norms. In most cases they are not codified or written down. They are enforced outside of legally sanctioned channels (Pahl-Wostl, 2009). A further distinction between formal and informal institutions is introduced by Scott (2001) who distinguishes between three pillars of institutions: regulative (what is formally allowed and what is not allowed), normative (what is right and what is wrong judged by societal standards), cultural-cognitive (what is thinkable and what is unthinkable).

Conversely, Hodgson and Calatrava (2006) identified some problems with North's definitions of institutions and organizations. They start with the definition of institutions as socially embedded systems of rules; it is evident that organizations are a special kind of institution, with additional features such as involving criteria to establish their boundaries and to distinguish their members from non members; principles of sovereignty concerning who is in charge, and chains of command delineating responsibilities within the organization. North himself acknowledged that it is possible for organizations to be treated as actors in some circumstances and generally to be regarded as institutions. After a careful review of North's distinction between formal 'rules' and informal 'constraints', they also suggested that these words should either be abandoned or used with extreme care. It may be best to use more precise terms such as legal, non-legal, and explicit instead.

For this research however, the author follows the definitions of Hodgson and Calatrava (2006) where institutions are considered as socially embedded systems of rules and regulations binding the behaviors of social actors; and organizations are viewed as special kinds of institutions with additional features mentioned before. Specifically, institutions can be defined here as any established law, ordered, method, and custom that for a long time has been an important feature of the society, and specifically where CPR stakeholders are governed by these institutions.

2.2.2 Institutional environment and institutional arrangement

The Institutional Environment is the set of fundamental, political, social and legal ground rules that establish the basis for production, exchange, and distribution. Rules governing elections, property rights, and the right of contract are examples of the type of ground rules that make up the economic environment. Environment can of course be altered. Changes can come from an amendment to the constitution either by political action or a change in judicial interpretation or from a shift in citizen's preferences (Lance and North, 1971).

Institutional Arrangement *(structure of rules)* is an arrangement between economic units that provide a structure within which members of a society-individually or collectively-cooperate or compete and govern the ways in which these units can cooperate and/or compete (Saleth and Dinar, 2004). The arrangement may be either a formal or an informal one and it may be temporary or long-lived. It must, however, be designed to accomplish at least one of the following goals: to provide a structure within which its members can cooperate to obtain some added income that is not available outside the structure; or to provide a mechanism that can effect a change in laws or property rights designed to alter the permissible ways that individuals (or groups) can legally compete. The arrangement may involve a single individual, a group of individuals voluntarily cooperating together, or the government (alone or in cooperation with one or more individual) (ibid). According to Ostrom E. (1990) *institutional arrangements* are sets of working rules that are used to determine who is eligible to make decisions in some situation, and what actions are allowed or constrained. Further, the rules describe what procedures must be followed, what information must or must not be provided and what payoffs will be assigned to affected individuals.

2.2.3 Strategies, norms and rules

According to Ostrom (2007), in order to understand institutional arrangements, confronting three concepts (*strategies, norms, and rules*) that are frequently used interchangeably in social science literature is an important component of the analysis: *Strategies* are plans of action that individuals adopt primarily for prudential reasons to achieve preferred outcomes in light of expectations of the likely strategies of others. *Norms* represent preferences related to prescriptions about actions or outcomes that are not focused primarily on short-term material payoffs to self. *Rules* are linguistic statements similar to norms, but rules carry an additional, assigned sanction if forbidden actions are taken and observed by a monitor. For rules to exist, any particular situation must be linked to a rule-making situation, and some kind of monitoring and sanctioning must exist. Rules may be crafted in any of a wide diversity of collective-choice or constitutional-choice arenas in local, regional, national, or international domains. Contemporary scholarship tends to focus on rules that are formally prescribed by a national government, but we must understand the process of rule making at a community level as well.

Tuomela R. (1995 cited in Hodgson and Calatrava, 2006) described rules as the product of explicit agreement brought about by some authority, and they imply sanctions. *Rules* and *norms* therefore differ by virtue of the different ways they enforce tasks on individuals. Even as norms can evolve entirely internal to an individual, most norms are acquired in the context of the community in which the individual interacts frequently and change in this context. Thus, the chance that others in a relevant community may learn about a norm-breaking action strongly reinforces the internal value assigned to the norm conforming action (Richerson and Boyd, 2005). Rules structure human behavior into four categories: compulsory, permitted, authorized and non-authorized (Thomson, 1992).

In this regard, Hodgson and Calatrava (2006) described rules as socially transmitted and customary normative injunctions or immanently normative disposions, that an individual in circumstances x has to do y. Rules include norms of behavior and social conventions as well as legal rules. Such rules are potentially codifiable. Members of the relevant community share tacit and explicit knowledge of these rules.

2.3 Interactive Governance theory

The Commission on Global Governance (1995 cited in Burger and Mayer 2003) defines governance as:

> *'The sum of the many ways individuals and institutions, public and private, manage their common affairs. It is a continuing process through which conflicting or diverse interests may be accommodated and cooperative action may be taken. It includes formal institutions and regimes empowered to enforce compliance, as well as informal arrangements that people and institutions either have agreed to or perceive to be in their interest.'*

Governance is process by which the collection of rules, norms, and strategies that guide behaviour within a given realm of policy interactions are formed, applied, interpreted, and reformed(McGinnis, 2011). On the other hand Hyden *et al*. (2004) defines *governance* as the formation and stewardship of the formal and informal rules that regulate the public realm where the state and other economic and societal actors interact to make decisions.

However the boundaries between governance, management and operations are not easily identified and are blurred. In most cases, the distinction between resource management, policy making and governance is not always very clear. Sometimes management and governance are even used as synonyms which are clearly not appropriate (Pahl-Wostl, 2009). Governance is much broader than management and policy making, and has many dimensions, including the interactions among all stakeholders that influence resource use outcomes as well as the principles that guide these interactions and the institutional arrangements within which they take place. Governance refers to a constitutional set of rules and regulations while management refers more to the practical level.

Basically, there are important differences between governance, policymaking and management. Still the differences between these activities are not straightforward and clear, and may vary with different culture and language. Thus what is termed 'policy' in one political culture may be known as 'governance' in the other traditions. Yet, governance is the more inclusive term, followed by policy, with management being the most instrumental and practical of the three concepts. Thus governance considers longer term trends and requirements with regard to natural resources, basing itself on an assessment of institutions and a discussion of the values to be attained. Policy deals with specific subjects in tighter time frames, whereas management grapples with the practical dimensions of its implementation (Kooiman *et al*. 2008).

Governance adds dimensions that are absent in a hands-on management approach (Kooiman *et al*. 2008). 'Resources management' refers to the activities of analyzing and monitoring, developing and implementing measures to keep the state of a resource within desirable bounds. The notion of 'resource governance' takes into account the different actors and networks that help formulate and implement environmental policy and/or policy instruments. Governance embraces the full complexity of regulatory processes and their interaction (Pahl-Wostl, 2009). Governance arrangements need to be broad in scope, having the potential to encompass all relevant aspects and impacts although all may not be taken up at the outset (Chakalall, B., R. Mahon, *et al*. 2007). At broader level, environmental governance should be understood broadly so as to include all institutional solutions for resolving conflicts over environmental resources (Paavola, 2007).

According to Pahl-Wostil(2009), to deal with the complexity of governance systems in a more systematic fashion the following four dimensions are introduced as a base for analyzing the characteristics of environmental governance regimes: Institutions and the relationship and relative importance of formal and informal institutions; Actor networks with emphasis on the role and interactions of state and non-state actors; Multi-level interactions across administrative boundaries and vertical integration; and Governance modes-bureaucratic hierarchies, markets, networks.

In recent times, interactive governance has become an important approach for understanding multi-level governance issues in natural resource management and governance in general fisheries and coastal governance in particular. As described by Edelenbos (2005), interactive governance is an approach whereby policy-making procedures have became more communicative and more participatory which means that most people to be affected by the plans are involved in early stages of decision-making. Kooiman *et al*. (2008), on the other hand, defined interactive governance as an integrated, communicative and politically informed approach which emphasizes solving societal problems and creating societal opportunities through interactions among civil, public and private actors.

From a recent development of interactive governance theory, it is argued that natural resource governance particularly fisheries and coastal governance may be seen as a relationship between two systems that could be termed a 'governing system' and a 'system-to-be-governed'. The governing system is social, and therefore man-made: it is made up of institutions and steering instruments and mechanisms. The system-to-be governed is partly natural and partly social: it consists of an ecosystem and the resources that this harbors, as well as a system of users and stakeholders who form social and political coalitions and institutions among themselves. One should also be concerned with the relationship and interaction between the two systems, which forms a system in its own right.

The social system affects change in the natural system, but it is also dependent and therefore vulnerable to these changes, since they set limits to resource users' potential (Jentoft, 2007). Interactive governance is a perspective that focuses on understanding the characteristics of the natural and social systems that are being governed, the governing systems, and their interactions.

> *'Interactive governance theory argues that for the relationship between the governing system and the social sub-system (that is to be governed) to be effective, structural adjustments are needed within both systems. The systems must be compatible in order to be mutually responsive. This is not a matter of natural mechanism, but of deliberate intervention, planning and institutional design by societal actors who are involved in different positions and levels of society such as legislative bodies, planning agencies and civic organizations-alone or, according to governance theory, preferably in concert'* (Jentoft, 2007).

Generally, governance is not merely something governors do, but comprises the totality of the interactions between those governing and those governed-it is itself an interaction (Bavinck *et al*. 2005). It is an ongoing social process that is constantly negotiated and achieved among relevant stakeholders (Wilkes, 2005).

2.4 Theoretical Debate on the 'Commons'

2.4.1 Rethinking 'The Tragedy of Commons'

The 'commons' include natural resources such as fisheries, wetlands, wildlife, forests, irrigation waters and pasturelands, which by their physical nature are not owned by individuals but are shared by a community or group of users, such as fishers. Over the course of almost fifteen years, between 1954 and 1968, scholars developed a number of models of 'tragedy of the commons'. In the 1950s, Scott Gorden and Antony Scott argued that open access conditions in fisheries lead to the economic destruction of fish stocks. Gorden called for government intervention in fisheries to limit fishers' harvesting efforts while Scott demonstrated that such undesirable economic and biological outcomes might be avoided by imposing a single ownership (privatization) on the fishery (Gorden, 1954; Scott, 1955 cited in Durant *et al*. 2004). Hardin's influential 1968 article in *Science* on 'The Tragedy of the Commons' is one of the most often-cited scientific papers written in the second half of the twentieth century. The article stimulated immense intellectual interest across the natural and social sciences, extensive debate, and a new interdisciplinary field of study (National Research Council, 2002).

As he develops the theory, Hardin (1968) envisaged a pasture open to all. It is to be expected that each herdsman will try to keep as many cattle as possible on the common pasture. As a rational being, each herdsman seeks to maximize his gain. Explicitly or implicitly, more or less consciously, he asks 'what is the utility to me of adding one more animal to my herd?' This utility has one negative component which is the function of the additional overgrazing created by one more animal and one positive component which is the function of the profit increment of one animal. Therefore, each herder receives the profit from adding animals while the costs are shared among other users; it makes sense for each herder to add more cattle, even though doing so contributes to their collective ruin. Then the rational herdsman concludes that the only sensible course for him to pursue is to add another animal to the herd. And another; and another…'*But this is the conclusion reached by each and every rational herdsman sharing a commons. Therein lays the Tragedy'* (Hardin, op.cit.).

Based on the theory of the 'Tragedy of the commons' Hardin concludes that the 'Commons' has come to connote inevitable resource degradation and 'freedom of the commons brings ruin to all' because benefits accrue to individuals and costs are collectively shared. By combining Gorden's and Scott's recommendations, Hardin suggests that there are only two collective solutions to avoid the 'Tragedy of the commons', either privatization or government control as a solution to which rights to entry and use could be allocated. The theorists on common-pool resources often take their point of departure in challenging and criticizing Hardin's notion of 'the tragedy of the commons', that proposed common property arrangements would bring ruin to all, because individuals have a tendency to free ride and act selfishly (Hardin, 1968). However, one important contribution that has developed in the common-pool resource literature is that individuals can cooperate and create institutional arrangements that can provide the mechanism whereby individuals can transcend and overcome tragedy of the commons situations (Ostrom, 1990; Baland and Platteau, 1996).

In recent years, scientists have observed that not all common-property resources are subject to such a 'tragedy' and are not overexploited (Cox, 1985; Ostrom, 1990, 1992; Feeny *et al*. 1990) and self-governance common-pool resources have frequently been observed in field studies (Dietz *et al*. 2003). Empirical studies (see for example, Bromley, 1992; Tang, 1992; Ostrom, 1990; Baland and Platteau, 1996; National Research Council, 2002) of sustainable resources suggested that more solutions exist than Hardin proposed. Both government ownership and privatization are themselves subject to failure in some instances (Ostrom *et al*. 1999). Several recent volumes summarize a growing and rich body of evidence relevant to common-property resource management (Feeny *et al*. 1990).

After analyzing different situations of common-property resources, Feeny *et al*. (1990) concluded by rejection of the simple one-to-one relationship between property-rights regime and outcome postulated by Hardin. The Hardin argument overlooks the important role of institutional arrangements that provide for exclusion and regulation of use. Societies have the capacity to construct and enforce rules and norms that constrain the behavior of individuals. What Hardin described is not a commons at all but what is nowadays called an unmanaged common-pool resource (Hyde, 2010).

There have been confusions that hinder communication among 'common' scholars across different disciplines and are still in the process of developing a shared language related to the broad set of things called 'the commons' (Ostrom, 2008). The sources of confusion relates to the difference between (1) common-property and open-access regimes, (2) common-pool resources and common-property regimes, and (3) a resource system and the flow of resource units (Ostrom and Hess, 2010). As clearly demarked by Ciriacy-Wantrup and Bishop (1975 cited in Ostrom and Hess, 2010) the difference between property regimes that are open access, where no one has the legal right to exclude anyone from using a resource, from common property, where the members of a clearly demarked group have a legal right to exclude non members of that group from using a resource. Open-access regimes have long been considered in legal doctrine as involving no limits on who is authorized to use a resource.

The major distinction between them is the property rights. The open access does not imply any kind of ownership (no property rights of anyone) but it may be used or exploited by everybody. So, it may be exposed to the risk and possibility of over-exploitation and degradation. The term 'common-pool resource' refers to a natural or man-made resource system that is typically defined in economic terms as a resource system that are rival and non-excludable and held by an identifiable user group. In other words, CPRs are systems where it is difficult to exclude users through physical or institutional barriers and where the use of the resource by one person or group leaves less for another (Ostrom *et al*. 1994).

According to Ostrom *et al*. (1994), a particular class of goods or events in the world shares two important attributes. These are: (1) the difficulty of excluding individuals from using or benefiting from a good and (2) the s*ubtractability* of the benefits consumed by one individual from those available to other users or beneficiaries. Therefore the goods and events that individuals value differ in terms of how easy or costly it is to exclude or limit potential users (beneficiaries) from consuming or using them once they are provided by nature or through the activities of other individuals, and the degree of subtractability of one person's use from that available to be used by others. Based on these attributes of exclusion and subtractability four kinds of goods (private, public, toll and common-pool resources) were identified (see Table 2.1)

Table 2.1: A general classification of goods

Exclusion[3]		Subtractability[4]	
		Low	**High**
	Difficult	**Public Goods** Free-to-air television, air, national defence	**Common-pool Resources** Fish stock, timber, coal, national health service
	Easy	**Toll/club Goods** Cinemas, private parks, satellite television	**Private Goods** Food, clothing, cars, personal electronics

Source: Ostrom *et al*. (1994)

Private goods are characterized by the relative ease of exclusion and high subtractability for which one person's consumption subtracts from the availability of consumable benefits to others. *Public goods* are the opposite of *private goods* with regard to both attributes for which consumption is not subtractable but exclusion is difficult or not possible either. *Toll goods* share with *private goods* the relative ease of exclusion and with *public goods* the relative lack of subtractability. *Common-pool resources* share with *public goods* the difficulty of developing physical or institutional means of excluding beneficiaries and the products or resource units from common-pool resources share with private goods the attribute that one person's consumption subtracts from the quantity available to others (Ostrom *et al*. 1994).

CPR are goods that can be kept from potential users only at great cost or with difficulty but that are subtractable in consumption and can thus disappear. Without institutional mechanisms that address excludability and subtractability, then, CPRs are essentially open-access resources available to anyone which is very difficult to protect and very easy to deplete (McKean, 2000). If anyone can use a resource, no individual or group has any incentive to conserve their use or to invest in improvements. The only way to exert control over the resource is to extract it before others can (Adams *et al*. 2001; Ostrom and Hess, 2010).

[3] It is reasonably possible to prevent a class of consumers/users (e.g. those who have not paid for it) from consuming the good.

[4] consumptions by one consumer prevents simultaneous consumption by other consumers

As Blomquist and Ostrom (1985) described common-pool resources are composed of resource systems and a flow of resource units or benefits from these systems. The resource systems (such as Lakes, rivers, irrigations systems, ground water basins, forests, fishery stocks and grazing areas) are systems that generate a flow of resource units and benefits. The resource units or benefits from a common-pool resource include water, timber, medicinal plants, fish, fodder etc. Therefore, devising property regimes that effectively allow sustainable use of a common-pool resource requires rules that limit access to the resource system and other rules that limit the amount, timing, and technology used to withdraw diverse resource units from the resource system (Ostrom and Hess, 2010).

The term 'common-property resource' is frequently used to describe a type of economic good that is better referred to as a 'common-pool resource'. Common-pool resources may be owned by national, regional, or local governments, by communal groups, by private individuals or corporations, or used as open-access resources by whom-ever can gain access (Ostrom and Hess, 2010) where varying degrees of access with multiple and often overlapping property rights may exist. Therefore, there is no automatic association that exists between common-pool resources and common property regimes or, with any other particular type of property regime (Ostrom and Hess, 2010; Hess and Ostrom, 2003).

Common property regimes can be defined as 'institutional arrangements in which a group of resource users share rights and duties toward a resource for the cooperative (shared, joint, collective) use, management, governance and sometimes ownership of natural resources' (McKean, 2000). In these regimes, no member of the user group has the right to exclude others, but the group has the right to exclude non-members from the use of the resource. Membership of the user group is usually contingent on having a presence in a location close to the relevant CPR, with the members living and/or owning land in that location (Conroy, 2002).

2.4.2 Collective action, devolution and property rights in CPR governance

2.4.2.1 Collective action and multiple use-multiple user interaction

Collective action can be defined as an action by more than one person directed towards the achievement of a common goal or the satisfaction of a common interest (that is, a goal or interest that cannot be obtained by an individual acting on his own) (Wade, 1987). As discussed in the previous section (sub-section 2.5.1), the debate about collective action in CPR management and governance has been distorted by a conceptual misunderstanding about the nature of such resources, caused by Garrett Hardin's unfortunate use of the term "commons" and its' ''tragedy'' to describe an "open access" regime (Steins and Edwards, 1999). As a result for a long time, there was a prevailing belief among policy-makers that the problems associated with CPRs could only be solved through either privatization of the resource or through state intervention (ibid). However, during the past decades empirical evidence has been brought forward that local user groups are capable of managing and governing such resources through collective action (McCay and Acheson, 1990 cited in Steins and Edwards; Ostrom, 1990; Bromley, 1992) which is often considered as a prerequisite for the development of community-based institutions and the devolution of authority that is required from central to local authorities (Meinzen-Dick and Di Gregorio, 2004).

On the other hand, as indicated by Swallow *et al*. (1997) most analyses of the efficiency of natural resource management and governance have failed to recognize that resources often have multiple uses and that there tends to be sub-groups of users who are characterized by their use patterns. For example the same water source can be used for irrigating, hydropower, fishing, navigating, washing, watering animals, or other enterprises by multiple stakeholders. They further argued that some resource uses are complementary, others are competitive, most are somewhere between. Some groups of resource users are mutually exclusive, others are overlapping, most are somewhere between. However issues of accommodating multiple uses and multiple-users are especially critical in the case of the commons.

The context of multiple-use can have a significant impact on the use of common-pool resources as a diversity of interests is linked with the common-pool resources, partly preserving and partly exploiting them. A multiple user context is defined if more than one person uses the resource for the same purpose. Multiple user scenarios are widely discussed and common-pool resources (CPRs) are defined for multiple user situations. The presence of multiple users in CPR situation can increase transaction costs in a dramatic way, especially by creating free rider problems and undermining negotiations about the optimal use (Smajgl, 2007).

According to Steins and Edwards (1999) complex, multiple-use CPRs are resources that are used for different types of extractive and non-extractive purposes by different stakeholder groups (multiple users) often with divergent interests and are managed under a mixture of property rights regimes. In such a scenario, collective action becomes increasingly complicated. Different resource uses will be regulated and governed through different decision-making arrangements by different user groups. Therefore when commons evolve into multiple-use resources, the institutional framework within which collective resource use takes place has to be re-negotiated among resource users and other stakeholders to avoid externalities associated with increased access of new users to the resource system, such as overexploitation, alienation of traditional users, and inter/intra-user group conflicts.

Collective action among the user groups is required to agree upon decision making arrangements, regulations about access to, allocation of, and control over the resource. However, the presence of a well established set of decision-making arrangements is not sufficient to guarantee sustained and negotiated collective action in the long term. For this Steins and Edwards (1999) introduce the concept of 'platforms for resource use negotiation' as one way of re-negotiating institutional frameworks to deal with the complexities involved in the management and governance of multiple-use CPRs and to coordinate collective action by multiple users.

On the other hand, Dietz *et al*. (2003) pointed out that successful commons management and governance is easier to achieve when: (1) use of resources can be monitored by community members, and the information can be verified and understood at relatively low cost (trees are easier to monitor than fish, and lakes are easier to monitor than rivers (2) rates of change in resources, resource -user populations, technology, and other economic and social factors are moderate (3) community members maintain direct communications and increase their trust of one another; (4) outsiders can be excluded from using the resource at relatively low cost and (5) users are able to monitor and enforce their collectively designed agreements themselves.

Successful self-organized resource regimes and institutions can initially draw upon locally evolved norms of reciprocity and trustworthiness and the likely presence of local leaders in most community settings (Ostrom, 2000). Local institutions such as chiefs and headmen can also played an important ecological role, setting boundaries that restricted natural resources use and enforcing them (Fabricius *et al*. 2013). Ostrom (1990) in her empirical research into the management and governance of local CPRs has identified eight (8) design principles (see Table 2.2) underlying successful collective action and long term institutions where fragile institutions tend to be characterized by only some of these design principles and failed institutions are characterized by very few of these principles (Ostrom, 2005).

These principles identify characteristics of common-pool resource management and governance systems that have been observed to be regularly associated with the long-term sustainability of that system. However, not all principles need to be realized in all circumstances, but the prospects for sustainable governance tend to increase when more of these principles are in place (McGinnis, 2011).

Table 2.2: Design principles underlying successful long-term institutions

Design Principle	Explanation	Function
1. Clearly defined boundaries	Individuals or households with rights to withdraw resource units from the CPR and the boundaries of the CPR itself are clearly defined	Enables participants to know who is in and who is out of a defined set of relationships and thus with whom to cooperate
2. Congruence	a. The distribution of benefits from appropriation rules is roughly proportionate to the costs imposed by provisional rules. b. The rules governing the contribution required of each user must mirror local conditions	Enables the local rules-in-use restrict the amount, timing, and technology and/or quantity of resource unit to be harvested
3. Collective choice arrangements	Participation by all affected individuals in deciding on and modifying operational rules should be possible	Enables most of the individuals affected by a resource regime participate in making and modifying their rules governing their commons
4. Monitoring	Either the local users themselves or persons accountable to the local user are responsible for monitoring the biophysical conditions and compliance with collective decisions	Enables users to keep an eye on resource conditions as well as on user behavior
5. Graduated sanctions	Sanctions should be graduated to reflect the severity, frequency, and context of resource use violation depending on the seriousness and context of the offense	Enables users who violate rules-in-use are likely to receive graduated sanctions from other users, from officials accountable to these users, or from both
6. Conflict resolution mechanisms	Low-cost and readily available conflict-resolution mechanisms must exist to mediate conflicts among resource users and between users and officials	Enables users and their officials have rapid access to low-cost, local arenas to resolve conflict among users or between users and officials
7. Minimum recognition of rights to organize	Users must have recognition of their own rights to organize institutions	Enables users to devise their own institutions that are not challenged by external authorities, have long-term tenure rights to the resource
8. Nested enterprises[5]	Appropriation, provision, monitoring, enforcement, conflict resolution and governance activities are organized in multiple layers of nested enterprises	Enables to understand governance activities that are organized in multiple layers of nested enterprises

Source: Based on Ostrom (1990, 2009)

[5] When common-pool resources that are being managed by a group are large and parts of larger systems, an eighth design principle may be present in robust systems (Ostrom, 2009).

2.4.2.2 Devolution of CPR management and governance

Centralized forms of natural resources management have often been criticized for top down ineffective governance, rule making and enforcement mechanisms in most CPR situations. After failing to effectively manage natural resource systems centrally, many governments are now undertaking *decentralization* and *devolution* programs to transfer responsibility for resource management to local governments and user groups (Meinzen-Dick *et al*. 2004). Across different continents (Asia, Africa and the Americas) and across different natural resource sectors (including water, forests, fisheries and rangelands) there has been a major policy trend of devolving control over natural resources from government agencies to user groups (Meinzen-Dick and Knox, 1999) and a paradigm shift in conservation and natural resource management and governance away from costly state-centered control towards approaches in which local people play a much more active role in CPR management and governance (Shackleton *et al*. 2002).

As a result, the partial devolution of authority for natural resource management and environmental policy-making from centralised state control to community-based control or co-management has evolved over the past three decades as an alternative approach to centralized forms of management predicated on state control of resources (Ostrom, 1990; Singleton, 2000; Armitage, 2005). *Devolution* refers to transfer of right and obligations over natural resource decision-making and benefits to users groups and management roles from a government organization to a non-governmental or financially autonomous one, which is usually a local organization constituted by resource users (Meinzen-Dick and Knox, 1999; Vermillion, 1999; Shackleton *et al*. 2002). *Devolution* is often part of a number of related policy reforms such as *deconcentration*[6], *decentralization*[7], and *privatization*[8].

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[6] In which decision-making authority is transferred to lower-level units of a bureaucracy, or government line agency, authority remains with the same type of institution, and accountability is ultimately still upward to the central government (see Agrawal and Ribot, 1999).

[7] refers to movement of management roles and decision making authority from higher or central levels to lower or local units within the same agency or ministry. Although still within the government, it provides a stronger role for local bodies (Meinzen-Dick and Knox, 1999; Vermillion, 1999).

At the heart of the *theory of devolution* is the argument that local, common users of a resource, who are empowered as a group to take over management and governance of the resource, have the incentive to manage and govern more efficiently and sustainably than does a centrally financed central government agency (Vermillion, 1999). When control over resources is transferred more or less completely to local user groups, it is often referred to as Community-Based Resource Management (Meinzen-Dick and Knox, 1999). Community-Based Resource Management (CBRM) efforts are based on assumptions that local communities and community-based organizations closely connected to natural resources are most likely to foster sustainable resource use and possess the knowledge required to do so (Armitage, 2005).

In the process of *devolution,* when the state or central government retains a large role in resource management and governance, in conjunction with an expanded role for resource users, it may be referred to as joint management or co-management. However, these are often not clear-cut, with most cases involving some form of interaction between the state and user groups (Meinzen-Dick and Knox, 1999). On the other hand, many such programs emphasize the transfer of responsibilities without transferring the corresponding rights. As a result, resource user groups may lack the incentive, and even the authority, to manage and govern the resources (Meinzen-Dick and Knox, 1999; Meinzen-Dick *et al*. 2004).

Based on evidence from a number of empirical studies on the impacts of natural resource devolution policies and strategies in several Asian and southern African countries from the perspective of local people, Shackleton *et al*. (2002) concluded that most 'devolved' natural resources management and governance reflects rhetoric more than substance, and is characterized by some continuation of substantive central government control, management and governance over natural resources rather than a genuine shift in authority to local people.

[8] refers to transfer from the public sector to private groups or individuals. This can include non-profit service organizations (grassroots or external NGOs) and for-profit firms (Uphoff 1998).

In most instances central government retained key aspects of management and governance authority, placing tight constraints on local decision-making. States, communities and other stakeholders have different visions of devolution and its mode of implementation. They further argued that more powerful actors in communities tend to manipulate devolution outcomes to suit themselves. The degree of organization amongst poor resource users and awareness of their rights were critical factors influencing devolution outcomes (ibid).

2.4.2.3 Property rights and natural resource management and governance

The ability to have effective command over natural resources however is based on firstly, securing resources access and use rights, and secondly on a series of processes that transform the rights into livelihood outcomes (Kepe, 2008a). Transferring property rights as part of devolution programs demonstrates a commitment on the part of the government to the devolution process that user groups' rights are commensurate with their responsibilities in managing and governing the resource. This implies that cases of "community-based resource management" would have stronger user rights than cases of joint management, where the state retains an active role in managing the system (Meinzen-Dick and Knox, 1999).

Institutions, such as property rights (the structure of rights to resources and the rules under which those rights are exercised) are mechanisms people use to control their use of the environment and their behavior toward each other (Bromley, 1991). People use and allocate land and natural resources through systems of property rights. What is important is not the type of resource, but the property rights regime in combination with the resource it is subject to, namely open access, private property, communal property and state property. Property rights define actions that individuals can take in relation to other individuals regarding some ‘thing’. If one individual has a right, someone else has a commensurate duty to observe that right (Ostrom, 2003).

Property rights are the rules that define an owner's rights and duties in the use of a particular resource. The types of property rights, and the strength of those rights, are key factors in determining the status of natural resources and the environment. Property rights to man-made goods and services are usually well-defined and well enforced. However, many environmental problems are the result of weak or poorly defined property rights over land and natural resources. This leads to the problem of over-exploitation and degradation of natural resources because there is no incentive on behalf of the user to manage or protect those resources. Yet, the resolution of property rights is only one necessary condition for resolving natural resource management and governance problems. There is no single set of property rights that can be applied as a common solution to natural resource problems (Bond *et al*. 2006).

The property rights of an actor is also embodied both in informal rules, social norms and customs, and their economic relevance depends on how well the rights are recognized and enforced by other members of society. It is important to note that the ability (power) of an actor to use valuable resources derives both from external/exogenous control and from internal/endogenous control. External control depends on the property rights of an actor or, in other words, on how his or her institutional environment-constitutions, statutes, regulations, norms, enforcement and sanctions- constrains and directs both the actor in question and outsiders. Internal control is established by the actors themselves through various investments aimed at gaining control over scarce resources involving monitoring, fencing, hiring private guards, checking reputations, and other measures (Alston *et al*. 1996).

The following definitions are given by Feeny *et al*. (1990) to describe these regimes:

- ***Open access****:* the absence of well defined property rights. Access to the resource is unregulated and free and open to anyone. It is characterized by the absence of any regulations, and the reference is to a situation where no identifiable entity has the right to exclude others from the use of the resource

- ***Private property**:* the rights to exclude others from using the resource and to regulate the use of the resource are vested in an individual or group. Private-property rights are generally recognized and enforced by the state and are usually exclusive and transferable; no individual or group has any incentive to invest in conserving the resource or refrain from harvesting the resource (Adams *et al*. 2001).

- ***Common /Communal/ property**:* the resource is held by an identifiable community of interdependent users who exclude outsiders while regulating use amongst members. The rights are unlikely to be exclusive or transferable and are often rights of equal access and use. The rights of the group may be legally recognized or *de facto.*

- ***State property:*** rights to the resource are vested exclusively in the government which makes decisions concerning access to the resource and the level and nature of exploitation. The category of state property may refer to property to which the general public has equal access and use rights. The nature of the state property regime also differs from the other regimes in that, in general, the state, unlike private parties, has coercive powers of enforcement.

Schlager and Ostrom (1992) identify five property rights that are most relevant for the use of natural resources in general and CPRs in particular, including access, withdrawal, management, exclusion, and alienation. Access to a CPR can be limited to a single individual or firm or to multiple individuals or teams of individuals who use the resource system at the same time. Property rights are regarded as well-defined where the entitlements of access, withdrawal, management, exclusion and alienation are clearly and effectively articulated (Stebek, 2011). However, property-rights systems that do not contain the right of alienation are considered to be ill-defined (Ostrom, 2000). In 2001 Ostrom further defines five classes of property-rights holders where individuals or collectivities may hold well-defined property rights that include or do not include all five of the rights defined below (see Table 2.3).

Table 2.3: Bundles of property rights and classes of owners

Type of Right	owner	proprietor	Authorized claimant	Authorized user	Authorized Entrant
Access	X	X	X	X	X
Withdrawal	X	X	X	X	
Management	X	X	X		
Exclusion	X	X			
Alienation	X				

With the 5 property rights defined as:
Access: The right to enter a defined physical area and enjoy non subtractive benefits.
Withdrawal: The right to obtain resource units or products of a resource
Management: The right to regulate internal use patterns and making improvements
Exclusion: The right to determine who will have access rights and withdrawal rights

Alienation: The right to sell or lease management and exclusion rights

Source: (Ostrom, 2001:135)

'*Authorized entrants' (Access right only)* include most recreational users of national parks who purchase an operational right to enter and enjoy the natural beauty of the park, but do not have a right to harvest forest products. Those who have both entry/access and withdrawal use-right units are '*authorized users'*. The presence or absence of constraints upon the timing, technology used, purpose of use and quantity of resource units harvested are determined by operational rules devised by those holding the collective-choice rights (or authority) of management and exclusion. '*Authorized claimants*' possess the operational rights of access and withdrawal plus a collective-choice right of managing a resource that includes decisions concerning the construction and maintenance of facilities and the authority to devise limits on withdrawal rights. '*Proprietors*' hold the same rights as claimants with the addition of the right to determine who may access and harvest from a resource. '*Owners*' possess the right of alienation - the right to transfer a good in any way the owner wishes that does not harm the physical attributes or uses of other owners - in addition to the bundle of rights held by a proprietor (Ostrom, 2000).

Several solutions have been proposed to overcome the potential externalities that arise from the free and open exploitation of CPRs. The '*privatization of the commons*' is a form of decentralized approach which endeavors to create exclusive, private and transferable rights over the flow (and where possible, the stock) of CPRs. On the other hand *state-based rights* is a form of centralized approach which try to overcome the externalities through state ownership of the resource stock and by imposing rules of access and withdrawal on resource users. *A community right is* another approach which defines how resources are used by community members with some form of exclusion of non-members (Grafton, 2000). However, which mix of rights and definition of characteristics is desirable, and who should have the right, will depend upon many factors including the objectives of management and the physical attributes of the resource (Ostrom, 1990; Grafton, 2000).

Community rights based property regimes over CPRs have existed for thousands of years and help manage resources (Grafton, 2000). Research evidence (Ostrom, 1990) also shows that community rights can help resources users 'avoid the conflict, uncertainty, and the deterioration or destruction of the resources involved'. However the existence of community rights and customary land tenure systems are challenged by privatization and state dominance in the management of CPRs.

Alden (2011) argued on conventional positions that customary land tenure is an anachronism that is diminishing, rather, customary land tenure is clearly being practiced for example by the majority of communities in Africa, is vigorous in its norms, has considerable commonalities across boundaries, and mirrors existing rural society in all its complexities, contradictions, and trends. However most rural Africans occupy and use lands that are not accepted in statutes as their private individual or collective property. This particularly affects their tenure over their commons (forests, rangelands, and marshlands). As the values of CPRs grow and state capture consolidates, the opportunity to recognize those resources as local property declines. As a result, the world is now witnessing a new era of resource capture (through privatization and land grabbing), one which deeply interferes with local rights and especially the commons (Alden, 2008).

The harmful effects of nationalizing common-pool resources particularly forests and that had earlier been governed by local user groups have been well documented. Resources that had been under a *de facto* common property regime enforced by local users were converted to a *de jure* government-property regime, but reverted to a *de facto* open-access regime. When resources that were previously controlled by local participants have been nationalized, state control has usually proved to be less effective and efficient than control by those directly affected (Curtis, 1991; Hilton, 1992; Panayotou and Ashton, 1992; Ascher, 1995 cited in Ostrom, 2000).

As reported by Poteete *et al*. (2010) case studies in Africa and Asia shows that how centralized resource management affected the traditional rights of local users that sparked a mix of sabotage and violent protests as resource users lost access to the resource system. Commercial development and privatization of common-pool resources without considering traditional private property rights is an example of State power and the desire to concentrate resource rents in the hands of a few. Policy interventions that threaten informal rights often generate considerable opposition among resources users and other stakeholders. Such clashes may be more frequent with multiple-use resource systems, where the State tends to prioritize privatization of resources and commercial uses while overlooking or discouraging subsistence use.

2.5 Empirical studies on CPR use, management and governance

Though humans have interacted with the biophysical environment since the beginning of human history, the scope and intensity of these interactions have increased dramatically since the 1970s. The magnitude, extent, and rate of change in human-natural interactions have been unprecedented in the past several decades (Liu *et al*. 2007b). And yet, coupled human-natural systems are not static; they change over time (Liu *et al*. 2007a). Particularly, the human population has almost tripled from 2.5 billion in 1950s to over 7 billion by the year 2012. As a result, the accelerating human impacts on natural systems may lead to degradation and collapse of natural systems which in turn compromise the adaptive capacity of human systems (ibid).

International research investigating the state of CPRs across different regions suggests that there is tremendous pressure on natural resource systems and the change to ecosystems during the past half century has been more rapid than any comparable period in human history (Ostrom, 2008, MA, 2005; 2006). The Millennium Ecosystem Assessment report shows that forests have effectively disappeared in 25 countries, and another 29 have lost more than 90% of their forest covers. More than half of the world's wetlands have been lost (Schuyt, 2005).

The sustainable governance of water resources in times of global change is one of the most pressing challenges of the 21st century (Pahl-Wostl & Toonen, 2009). Ostrom (2008) reported that, although some of the specific niches where some commons are in a better condition today than they were a decade or two ago, the tragedy of massive overfishing of the oceans and on major deforestation has been observed. She further argued that the reason for mixed results is that most common-pool resources differ vastly from one another and vary from place to place.

Wisborg *et al*. (2000) indicated that many developing countries experience an increasing trend that appears to threaten CPR management regimes through institutional changes leading to open access situations or conversion to private property, legally or illegally. They further argued that lack of adequate institutional frameworks and effective implementation coupled with competing interests of multiple stakeholders in withdrawals from CPRs increase the pace at which these resources are depleted and leads to overconsumption and degradation of CPRs.

Williams (1998) was able to highlight that, in the semi-arid West African region, climatic, demographic and economic changes are beginning to threaten the existence and long-term sustainability of CPRs. The combination of increasing aridity, drought and population pressure has resulted in substantial shifts in land use and put stress on CPRs. He further argued that this substantial shift has led to the expansion of area under cultivation that involved mainly the conversion of large areas of CPRs such as forests, wetlands and rangelands into cropland, with farmers overriding and ignoring the traditional use rights of other groups to these resources. As a result the loss of rangeland through alienation and encroachment of farming has heightened conflicts between farmers and pastoralists in the region.

2.6 Modified Institutional Analysis and Development (IAD) framework

The development of a conceptual framework for this dissertation began with a brief review of concepts and theories related to institutions, interactive governance, complex system and CPRs as discussed in the previous sections, which enables the researcher to identify and include the most relevant institutional and CPR management and governance problems in Lake *Tana* sub-basin. Therefore in order to better understand the complex Lake *Tana* ecosystem, an integrated and modified Institutional Analysis and Development (IAD) framework developed by Ostrom *et al*. (1994) and Interactive Governance framework by Kooiman *et al*. (2008) were used.

Elinor Ostrom and her colleagues at the workshop in Political Theory and Policy Analysis developed the Institutional Analysis and Development (IAD) framework in the context of an analysis of irrigation institutions. The method focuses on a technique for arraying a norm and rule inventory and recording changes in that inventory over time brought about by diverse processes for making changes (Ostrom, 2007). The IAD framework has been developed to enable the analysis of 'institutional settings'-any situations that involve people interacting together in a certain context and following certain rules. The sets of rules relevant to any institutional setting are the institutional arrangements of that setting. This framework has been trialed and applied in a range of situations to systematically analyze the structure of situations faced by individuals and to determine how rules, the nature of events and the attributes of the surrounding environment and local community affect these situations over time (Smajgl *et al*. 2009).

The strength of the IAD framework developed by Ostrom and her colleagues is derived from its systematic theoretical focus on the impact of rules and norms on individual incentives in complex ecological-socio-economic systems, its empirically-oriented focus on outcomes, and by its accounting for dynamic system interactions at multiple tiers of analysis (Ostrom, 1999). This framework allows the integration of several theories of action across domains that would otherwise be examined in isolation from each other (Koontz, 2003).

Unlike the earlier approaches IAD deals mainly with CPRs. IAD perceives that each commons situation is different and requires its own language and explanatory theory. The most important part of the IAD framework is the identification of a conceptual unit, the so called action situation, in order to position a clearly defined research frame, hence to narrow down what has to be regarded as relevant and non-relevant for the research (Stellmacher, 2007).

The IAD framework focuses on seven important elements in order to understand various CPR situations. They are (i) attributes of physical world (ii) attributes of community (iii) rules in use (iv) action situations which include individuals (acting on their own or as agents of organizations) observe information, select actions, engage in patterns of interaction, and realize outcomes from their interaction (McGinnis, 2011) (v) patterns of interaction (vi) outcomes and (vii) evaluative criteria (Reddy, 2000). Whereas, it should be noted that the IAD framework is not a fundamental model in which data is inputted and an output is generated, rather the framework is a method for logically arranging information, examining relationships among attributes and considering or describing outcomes.

Despite the fact that this set is comprehensive and useful for situational analysis, the framework focuses mainly on institutional sustainability and does not address other important aspects such as institutional innovation and change triggered by the external environment. Besides, it neglects the supply side factors such as policy environment, political environment, external factors, etc, which are equally important not only for institutional innovation and change but also for sustainability. Hence, the framework remains one-sided (Reddy, 2000).

Though the IAD framework precisely offers a multi-level structure, linking the operational level where actors make decisions on natural resource management and governance to the collective choice and constitutional levels, where actors decide on the rules for decision-making, most commons literature has been restricted to the study of collective action among local communities without expanding the framework to higher government and institutional levels. The application of the framework to the study of natural resource management and

governance has often been restricted to the study of operational rules designed by the communities managing natural resources with little consideration of policy decisions taken at higher governance and government levels (Clement, 2010).

Clement (2010) further argued that the framework has been little applied insofar to the study of environmental policy processes across government levels because of a number of weaknesses. First, it lacks locating the unit of analysis in its historical, social and discursive context. As a result, it does not help the analyst to explain why some of the identified variables are more important in some contexts than in others. Secondly, the framework does not adequately capture how power distribution at each governance level and between different levels affects rule crafting and the transformation of rules into actual practices.

As a result Clement (2010) proposed modifications to the IAD framework to incorporate two exogenous variables to the original IAD framework: the politico-economic context and discourses. These variables impact both the action situation-notably in the way they position actors-and the actors, as they shape values, norms and preferences. The development Clement (2010) proposes aims at "politicizing" the framework, i.e. adding to its ability to analyze natural resource policy processes, including the assessment of policy impacts and policy change, across multiple governance levels. It is hoped that the modifications to the framework will support more accurate analyses of the success and failure of decentralized natural resource policies, guide the design of sound policy recommendations and ultimately contribute to improved policies.

Similarly Ostrom (2009) provides a framework for analyzing socio-ecological systems (SES), showing the relationships among four first-level core subsystems of an SES that affect each other as well as linked social, economic, and political settings and related ecosystems. The subsystems are (i) resource systems (in this research context, lake *Tana* and its associated resource systems like fish stock and wetlands); (ii) resource units (e.g., fish, and amount and flow of water); (iii) governance systems (e.g., the government and other organizations that manage the CPR in the sub-basin, the specific rules related to the use of specific resources, and how these rules are made); and (iv) users (e.g., individuals who use the resources in diverse ways for sustenance, recreation, or commercial purposes). In

addition, Epstein *et al*. (2013) considers the biophysical components of the SES framework and proposes the addition of 'ecological rules' as core subsystem. The use of ecological rules can identify important ecological features, and avoid attributing success or failure to the social aspects of a set of cases when there are theoretically relevant ecological differences. It also helps to explore the interplay of social and ecological factors.

On the other hand, supplementing the modified IAD with other frameworks such as the Interactive Governance (IG) framework provides a promising integrated framework to better understand complex systems like Lake *Tana* ecosystem. The Interactive Governance (IG) model developed by Kooiman *et al*. (2008) is an innovative approach for understanding and dealing more adequately with societal problems and opportunities, and takes a systems approach to examining the nature of these interactions, the likely consequences for governance outcomes, and what governing interventions should be considered.

The model is a diagnostic lens to identify where in the systems problems may lie, and what aspects of the systems may foster or inhibit governability. The integrated and comprehensive lens that the interactive governance perspective brings to the concerns, challenges and problems related to CPR systems and human interactions helps broaden the possibility and opportunities for better solutions. It is also a prescriptive tool in that it helps determine which governing responses and interventions, including institutions and policies, need to be put in place in order to improve the overall natural resource governance system (Chuenpagdee, 2011).

IG-theory provides a framework for studying the interactions between ecosystem and society, and for providing direction to policy (Bavinck *et al*. 2005). According to this framework every societal sector can be divided into two parts: a System-to-be-Governed (SG), and a Governing System (GS). For a governing effort to be successful these parts need to be compatible; in other words, the GS must take adequate account of the nature of the SG. Where this is ignored, governance fails and society suffers (Bavinck, 2009). Both frameworks can complement each other to maximize their strengths and minimize the weaknesses. Besides, there are similarities in both models that could be shared as common features.

As indicated by Lee (2003), levels of institutions (Constitutional, Collective-choice and Operational levels) explained by the IAD framework correspond exactly to the levels of governance (Meta or third, Second and First order governance) explained by the IG framework. Ostrom (1986) also suggested that, governance can be understood even more clearly by the IAD framework, which is a meta-theoretical framework for analyzing social phenomena and 'nestedness' of governance can also be better analyzed with the help of the IAD framework by identifying three levels of analysis ('operational, 'collective choice, and 'constitutional choice').

Therefore, the overall approach used in this study for attempting to identify the overall human-nature interactions in Lake *Tana* sub-basin is summarized in Figure 2.1. The figure presents the combined general elements of the IAD and IG framework, which involves an integrated framework to guide the research. At the heart of the framework are the 'action situations' where the 'system-to-be governed' (SG) and 'Governance system' (GS) overlap to make the Governance Interaction (GI) happen (Chuenpagdee, 2011). According to governance theory, these systems share similar structural attributes: they are diverse, complex, and dynamic and operate at different scales. They are also affected by external environments that trigger changes at different levels. Ultimately the interactions of actors with the existing scenario (attributes of the natural and human sub-systems) and the 'rules of the game' will yield an outcome that will affect in turn the whole system at different scales.

The following section discusses the different components of the modified framework.

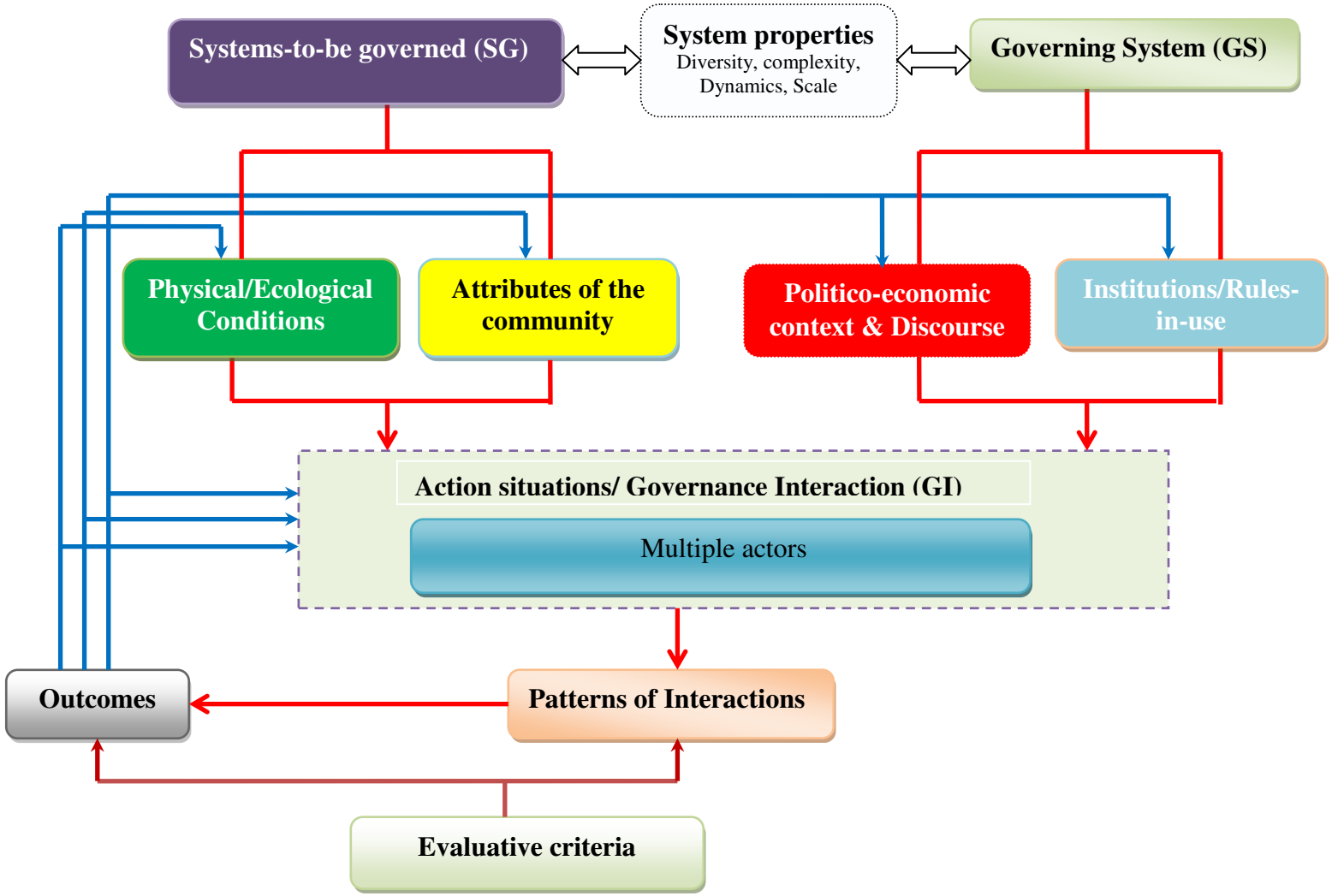


Figure 2.1: General elements of the integrated framework
Source: Adapted and modified from Ostrom *et al*. (1994), Kooiman *et al*. (2008) and Clement (2010)

i) System-to-be governed (SG)

Biophysical world, communities and other stakeholders: The IG-approach highlights four features/system properties of SG that are of crucial importance for governance design: their diversity, complexity, dynamics and scale. The act of governing is deeply influenced by these features of the system, as well as by issues of scale (Bavinck and Salagrama, 2008). Hence, diverse SGs are argued to require a rich diversity of governance efforts, whereas complex SGs necessitate a sophisticated governance approach. Dynamic SGs mean that policy makers must be flexible and be capable of acting on the basis of learning about the changes continuously taking place.

Attributes of the resources/biophysical world: Describe biophysical conditions and trends. This varies from setting to setting across the Lake *Tana* Ecosystem. The fishery sub-ecosystems, for example might include elements such as rate of growth, diversity of species present, climate and weather, terrain, and other physical factors that impact the state of the fishery ecosystem and the humans that interact with it. Other elements include size of the resource, temporal and spatial variability of resource units, current condition (Ostrom, 1990). Technology also affects how a biophysical world operates over time, and changes in technology may have substantial impact on the incentives facing individual participants (Ostrom, 2007).

Attributes of Community and other stakeholders: The attributes of resource users encompasses both local communities and extra-local users (Oakerson, 1992; Ostrom, 2005). Many variables can be used to analyze relevant attributes of a community that are likely to affect behavior in human interaction situations (Richerson and Boyd, 2005). Community attributes such as resource users' sources of incomes and the presence or absence of social, economic, cultural and location differences among resource users affect the users' incentives to cooperate (Tang, 1992). The knowledge and perception of community members and other stakeholders is an important context that affects individual actions, including things like 'generally accepted norms of behavior, the level of common understanding about action situations, the extent to which preferences and perceptions are homogeneous, and distribution of resources among members' (Ostrom, 1990).

ii) The governing system (GS):

Politico-economic context and discourses: The examination of the role of the politico-economic context and discourses is meant to bring the analyst to explicitly consider power and values within the action arena. The politico-economic context is to be examined under a dynamic perspective to understand how power has been distributed among actors who take decisions and how political and economic interests have driven actors' decisions within a particular set of rules-in-use (Clement, 2010). Discourse in this context means a "*specific group of ideas, concepts, and categorizations that is produced, reproduced, and transformed in a particular set of practices and through which meaning is given to physical and social realities*" (Hajer, 1995). Discourses are linked to institutions not only in how discourses affect institutions but also in how discourses have emerged in a particular institutional and politico-economic context (Clement and Amezaga, 2009). This research focuses particularly on development versus environmental protection discourses.

***Institutions/Rules-in-use*:** The rules in use cover broad governance arrangements at constitutional and collective choice level down to specific rules regulating use of a given CPR (Ostrom, 2005; Ostrom *et al*. 1994). The interactive governance model recognizes three modes of governance, hierarchical, co-governance and self-governance, all of which are possible, depending on the properties of the systems that are being governed, the capacity of the governing systems, and the quality of their interactions. *Self-governance* refers to situations in which actors take care of themselves, outside the purview of government, where management authority and decision-making power rest within resource users organizations. It is also embedded within the societal realm of societal interferences, where individuals, families, groups, organizations, and even societal sectors govern themselves (Bavinck *et al*. 2005; Kooiman *et al*. 2008; Chuenpagdee, 2011).

Hierarchical governance is the classical governance mode and characteristic of the interactions between a state and its citizens. It is a top-down style of intervention, with steering, planning and control as key concepts, which are expressed in instruments such as laws, rules, regulations and policies (Bavinck *et al*. 2005). In the co-governance perspective, parties co-operate, co-ordinate and communicate 'sideways', without a central or dominating

governing actor. It is a situation where governments, resource users and/or community groups work collaboratively or engage in partnership arrangements to care for the ecosystems (Chuenpagdee, 2011).

The model further depicts three kinds of governance orders, namely first, second and third order governance, which is similar to that of Ostrom's constitutional choice, collective choice and operational levels at which rules can be crafted and operate. According to Kooiman *et al*. (2005, 2008), the order of governance can be imagined as three concentric circles nested as in the peels of an onion. The outer ring deals with day-to-day affairs, and is termed first order governance/operational level. The second ring - second order governance/collective choice level-deals with institutions, whereas the third-meta-governance/constitutional choice level, involves debate on the underlying values and principles of the overall governance system.

First-order (operational level) governance takes place wherever people and their organizations interact in order to solve societal problems and create new opportunities. At this order, governance is occupied with day-to-day problem solving, enforcement of rules, resolution of conflicts within and among stakeholders, taking actions that are normally followed. It focuses on the day-to-day impacts of existing rules and norms on the incentives of actors (Rudd, 2003). *Second order (collective choice level) governance* focuses on the institutional arrangements within which first order governing takes place and rules that are chosen for a resource use (fishery or wetlands) and decision-makers create rules to impact operational-level activities (Koontz, 2003). Here, the term 'institution' denotes the agreements, rules, rights, laws, norms, beliefs, roles, procedures and organizations that are applied by first-order governors to make decisions.

Third order (Constitutional choice level) governance feeds, binds, and evaluates the governing exercise at the second order governance. At this level the main normative principles and values are articulated in order to guide the behavior of first-and second-order governing. Constitutional choice outcomes affect collective choice decision-making, which, in turn, affects operational-level activities (Koontz, 2003). Particularly, in resource

management issues, the primary focus is on who has the rights and power to set lower level rules regarding access to, and utilization of resources. The rules-in-use at this level are concerned with the aggregation and expression of stakeholder and societal preferences. This is largely a matter of property rights that define what level of control resource users and other actors have over resource access and appropriation (Rudd, 2003). For effective and legitimate governance of CPRs all these orders of governance are needed.

Action Situations: The point of intersection for Governance Interaction (GI) to happen

When conducting an institutional analysis, the analyst first identifies the 'action situation, where governance interaction takes place'. In ecological-socioeconomic analyses, a geographically explicit action situation accounts for the behavioral linkage between contextual variables and rules-in-use on the one hand, and ecological, social and economic outcomes on the other (Rudd, 2004). However, the action situation is not bound to a limited structural or geographical size; it may exist within households, village communities, local, regional, national and international councils, as well as in firms and markets (Ostrom, 2005). In all institutional analyses, the contextual variables that frame and constrain the action situation need to be specified, including variables relating to the physical and material world within which the actors interact, the attributes of community and the institutions or 'rules-in-use' that govern behavior (Crawford and Ostrom, 1995). The IAD framework starts with the action situation as the unit of analysis and focus of investigation.

An action situation is the 'social space where individuals interact, exchange goods and services, engage in appropriation and provision activities, solve problems, or fight in conflicting situations'. It includes the following elements: 'participants in positions who must decide among diverse actions in light of the information they possess about how actions are linked to the potential outcomes and the costs and benefits assigned to actions and outcomes'. Ideally, the action situation is one for which the institutional arrangements can be modified to bring about more desirable outcomes (Smajgl *et al*. 2009).

The *participants* in an action situation are the decision-making entities who play a certain role and who are capable of selecting actions from a set of alternatives available in a decision process (Ostrom, 2005). An actor is the individual, or group functioning as a corporate actor, who takes action. Actors are characterized by four features: '(1) the preference evaluations that actors assign to potential actions and outcomes; (2) the way actors acquire, process, retain, and use knowledge contingencies and information; (3) the selection criteria actors' use for deciding upon a particular course of action; and (4) the resources that an actor brings to a situation' (Ostrom, *et al*. 1994). The IG assumption related to the Governing System (GS) is, every societal sector has many people and organizations involved in the governing process. Some of these people and organizations belong to 'government'; others are involved in 'the market' and 'civil society' (Bavinck *et al*. 2005).

Patterns of interaction: Patterns of interaction refer to the bargaining processes among actors in which they exchange resources, devise new rules, and demand action from other stakeholders (Di Gregorio *et al*. 2008). The *patterns of interaction* between participants in an *action* situation result in *outcomes* that may feed back into the original exogenous variables and action situation and thereby restructure the situation (Smajgl *et al*. 2009). Actors make choices based on their own preferences, objectives or mandates (in the case of government agencies), the costs and benefits that they assign to alternative actions and outcomes, and strategic considerations (e.g., expectations of the behavior of others). These individual choices lead to aggregate patterns of interaction relevant for user- based resource governance and management. Patterns of interaction result directly from the aggregate effects of individuals going about their day-to-day decision-making. In fishery system for example usually five main patterns will be of interest: fishing effort (or use of other resource users), fishing location, choice of technology, compliance with existing rules, and conflict or cooperation with other resource users (Rudd, 2003).

Outcomes and evaluative criteria

According to McGinnis (2011) *outcomes* are shaped by both the outputs of the action situation and by exogenous factors. *Evaluative criteria* may be used by participants or external observers to determine which aspects of the observed outcomes are deemed satisfactory and which aspects are in need of improvement in terms of:

- *Efficiency* in use of resources.
- *Equity* in distributional outcomes and processes.
- *Legitimacy* as seen by participants in decision processes.
- *Participation* tends to increase legitimacy and co-production.
- *Accountability*, especially to direct users of resource.
- Consistency with the *moral values* prevalent in that community
- *Adaptability, Resilience, Robustness, or Sustainability*-a system's capacity to suffer a disturbance and yet still continue to function, without losing its basic structural or functional integrity.

The evaluations of the outcomes depend to a great extent on the evaluative criteria used by participants or the external evaluative criteria of the system (society) they operate within. These criteria may differ between stakeholder groups and it is important to be clear about which groups will evaluate the outcomes from which perspective. The same physical outcome may be evaluated positively by one group and negatively by another.

Depending on the particular action situation chosen and the nature of the impacts and how they are evaluated, the analysis may then lead to insights about how current institutional arrangements restrict or enable desirable outcomes and to recommendations about a set of institutional arrangements that may be able to bring about more desirable outcomes. The assessment of the outcomes of any action situation depends to a great extent on the evaluative criteria used by participants (Smajgl *et al*. 2009).

2.7 Chapter summary

Globally, literatures that exist concerning CPR management and governance are too diversified to be exhaustively reviewed here. Hence, for this research, attempts were made to review relevant literatures and draw on selective theories to develop and explain the conceptual framework. The review of literature addresses the main issues pertinent for this study, particularly institutional arrangements, CPR management and governance. Much theoretical and original work conducted on the analysis of CPRs management and governance has focused and implicitly only considered single-use resources like water, pastureland, forest, or fishery resources use by a single distinct user group (Adams *et al*. 2001). However, in a very complex and multiple use-multiple user resource systems, it would be difficult to understand the general picture of the resource-user interaction with a single case study. It is therefore necessary to also investigate the relationships between different common-pool resource systems, multiple users and their relationships under a complex system.

Therefore, this research framework attempts to capture a more holistic and systemic approach to CPR use, management and governance issue in Lake *Tana* sub-basin. The study has adopted a combination of the modified IAD framework and Interactive Governance model since; first this approach provides a comprehensive lens to explore the research problem through an elaborated and extended framework that addresses the key features of the CPR governance system; second, the framework helps to identify and depict the missing link in the Lake *Tana* resource management and governance system. Building on the institutional analysis and development (IAD) framework, and incorporating principles from the interactive governance, CPR and Complex systems theories the framework is applicable across multiple scales of analysis, linking local stakeholder dynamics to the broader institutional and governance context. The framework however does not attempt to solidify any blue print for CPR use, management and governance system in the region, but rather to assess the overall governance environment and to better understand the action situation where multi-stakeholders are interacting with an outcome that eventually has an impact on CPR system with a particular emphasis on Lake *Tana* (water), fishery and wetland commons.

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1 Introduction

The primary purpose of this chapter is to discuss the research methodology used preceded by a brief description of the study area. An over view of the context as well as social and environmental setting of sampled districts and case studies are also presented. Specific research methods and approaches that were used in this study are discussed in detail.

3.2 Description of the Study Area

3.2.1 Ethiopia: an overview

Ethiopia is geographically located between 33^0 and 48^0 East longitude, and 3^0 and 15 minutes and 18^0 north of the equator; it is bounded by the Sudan and South Sudan on the West, Somalia and Djibouti on the East, Eritrea on the North and Kenya on the South. Ethiopia comprises an area of 1.14 million square kilometers (which is approximately as large as France and Spain combined). Out of this, 74 million ha or 66 percent of the total area is deemed suitable for agriculture. Located in the East Africa sub-region better known as the Horn of Africa, the topography of the country is largely a high plateau. It ranges from 100 meters below sea level in the *Dallol* depression of *Afar*, to mountain peaks of over 4,000 meters above sea level in the Semin Mountains. Ethiopia is the oldest independent country in Africa and one of the oldest in the world. What are believed to be the oldest remains of a human ancestor ever found, which have been dated as being some five million years old, were discovered in the Awash Valley in Ethiopia. This beats the discovery of 'Lucy', a 3.2 million year old skeleton, who was unearthed in the same area in 1974 (CIA, 2012; FDRE, 2012).

Based on the 2007 population and housing census, the Ethiopian Central Statistical Authority (CSA) estimated the population of Ethiopia to be 84,320,987 in July, 2012. However, according to CIA estimation in 2012 the population is 93,815,992 which would place the country as one of the most populous in Africa (ranked 2nd following Nigeria) and the 13th most populous country in the world. With an annual rate of population growth of 3.179%, Ethiopia also ranks 5th in the world. The Population Reference Bureau (PRB) has estimated a population of 174 million in 2050, which would make Ethiopia the 9th most populous country.

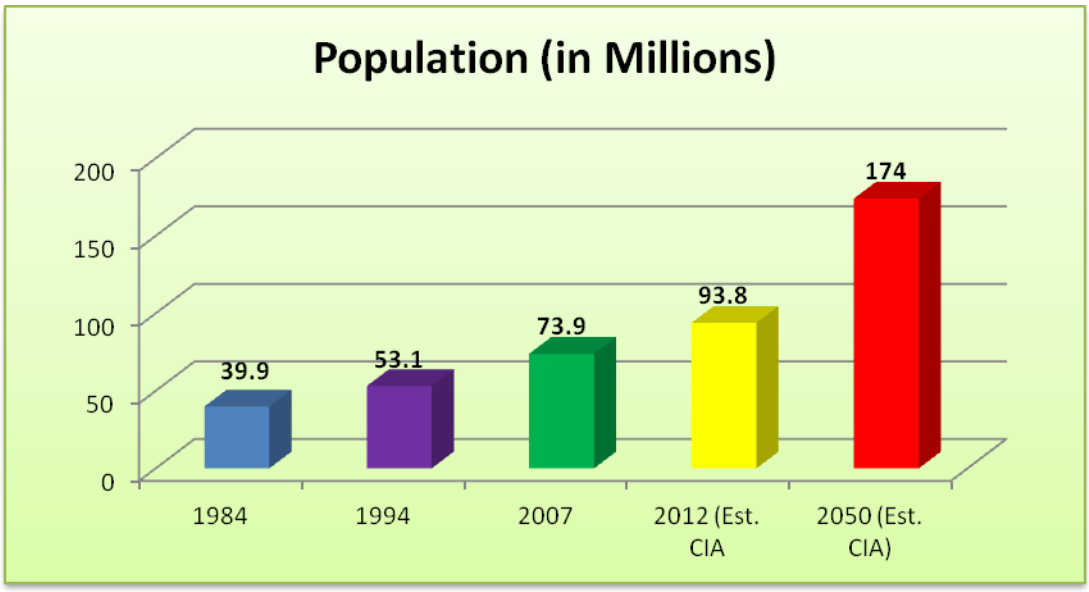


Figure 3.1: The trend of Ethiopian population growth since the 1980s
Source: Extracted from CSA, 2007 and CIA, 2012.

As indicated in Figure 3.1 (above) each successive population and housing census demonstrates that national population size increased in steady increments of significant proportions. For instance, a comparison of the 2007 census results with those from 1994 shows that the population of the country increased by more than 20 million persons over that time period. Similarly, in the previous decade (1984 to 1994), the population of the country increased by 13.2 million (CSA, 2007). As per the CIA estimation, after 35 years or more the Ethiopian population will be almost doubled.

The Ethiopian economy largely depends on agriculture with an employment rate of 80% of the population and which accounts for about 83.1% of the exports (MoFED, 2008/09). Agriculture, which contributes 41% of GDP, is still predominantly small holder (85%) and traditional. Coffee is a major export crop. The national Gross Domestic Product (GDP) of Ethiopia for the years 2011 was estimated 94.76 Billion USD. Since the 1990s, Ethiopia is following an Agricultural Development Led Industrialization (ADLI) strategy with the major goal of bringing about transformation of the country's economy. The assumption is that growth in agriculture spurs a series of inter-linkages in other sectors of the economy, as it has forward and backward linkages.

Very recently, the country is implementing a new Growth and Transformation Plan (GTP), a medium term strategic framework for the five-year period (2010/11-2014/15). The ambitious five year growth plan and transformation projects Gross Domestic Product (GDP) growth of 11-15% per year from 2010 through 2015. This plan is expected to create significant investment opportunities primarily in the agricultural and industrial sectors. At the same time a Climate Resilient Green Economy Strategy (CRGE) was developed in 2011 and launched at the 17th Conference of the Parties to the United Nations Framework Convention on Climate Change in Durban, in 2011(EPA, 2012). The GTP envisages that the country's GDP per capita would grow from 378 USD in 2010 to 1,271 USD in 2025. Besides, the CRGE strategy projects that the contribution of agriculture will diminish from 42% to 29%, indicating migration of jobs from the agriculture sector to industry and services (MoFED, GTP, 2010).

According to the African Economic Outlook report, in 2011 (fiscal year [FY] 2010/11), the Ethiopian economy grew at 11.4% marking the eighth consecutive year of rapid growth. Moreover, growth has continued to be broad-based with industry, services and agriculture growing by 15%, 12.5% and 9% respectively. Hotels and restaurants, real estate, renting and business activities, and financial intermediation made the largest contribution to the growth of the services sector. The services sector is expected to continue to grow rapidly, though at a slower pace than in previous years, at 7% and 7.6% in 2012 and 2013 respectively. The agricultural sector, which accounts for 80% of employment, remains a key source of growth.

In 2011 the sector grew by 9%, driven by cereal production which reached a record high of 19.1 million tons in 2011. Ethiopia's overall growth prospects in 2012 and 2013 are good, with public investment in infrastructure, commercialization of agriculture and non-traditional exports expected to continue driving growth. Real gross domestic product (GDP) growth for 2012 and 2013 is projected at 7% and 7.6% respectively. While these projections are lower than the GTP projections and official GDP out-turn figures, at these levels the Ethiopian economy would still maintain its high growth momentum (AEO, 2012).

3.2.2 CPR management and governance in Ethiopia

Ethiopia is a country with high biodiversity, distinctive ecosystems and richly endowed with huge manpower, arable land and natural resources. However, much of its potential is not yet exploited and uncontrolled population growth puts ever- increasing pressures on the country's natural resource base. Ethiopia's ecological system is fragile and vulnerable to climate change. Key challenges include soil degradation, deforestation and loss of biodiversity, which have been compounded by population pressure on land, especially in the highlands (ibid).

The literature on CPR in Ethiopia, particularly studies on institutional arrangement and governance is limited. In this sub-section, a number of empirical studies that have been conducted on CPR issues are highlighted. Existing research reports show that common-pool resource in Ethiopia in general and Lake *Tana* sub-basin in particular are rapidly degrading, not only threatening the livelihood of the local communities but also contributing to rural poverty, but also affecting the region's ecosystem.

Ethiopia was once richly endowed with common-property resource regimes among a variety of social groups (Admassie, 2000 cited in Ashenafi and Leader-Williams, 2005). However, CPRs are under heavy stress in Ethiopia in large part resulting from a long period of institutional change from feudalism (before 1974) through centralized socialism (between 1974 and 1991) to democracy and decentralization (since 1991), that abolished or undermined the traditional management and governance systems, combined with large scale

resettlements, incoherent environmental policies and weak formal rule enforcement all of which created many quasi open access areas across different regions (Reichhuber *et al*. 2009). Despite the fact that rules and regulations are enacted at constitutional level, the enforcement of these rules to govern and protect the natural resources is very weak. Rules are enacted in a top-down manner without considering the local context and informal institutional arrangements.

A study conducted by Kebede (2002) based on fifteen rural sites in Ethiopia confirms that most CPRs are in a state of either exhaustion or stress. In some areas, apparently there are no restrictions on the use of certain resources (effectively open-access resources).The dominant trend which emerged from the description of conditions of CPRs in the survey sites indicated that they are increasingly being depleted. The depletion of grazing areas is particularly increasing at an alarming rate. In almost all the survey sites, forest areas and other vegetation cover found on land, not directly used by households, have significantly decreased.

Bogale *et al*. (2006), in their case study of *Hirna* watershed in Western *Hararge* administrative zone of *Oromiya* Regional State, highlighted that, the drive for collective action to successfully govern and maintain the natural resources is failing. Their household survey result shows that the degree of belongingness to conserve and manage natural resources particularly common-property resources has declined. This is manifested by the decline in frequency and duration of participation of households in community affairs. Almost all sample households feel that it is the responsibility of the government to look after the sustainability of the natural resources. They further argued that, resource scarcity also causes individual households to focus on narrow survival strategies, which reduces the interaction of civil society and weakens local institutions. This segmentation reduces social capital-trust, norm and networks-which gives an opportunity for powerful groups to grab control over resources inviting conflict.

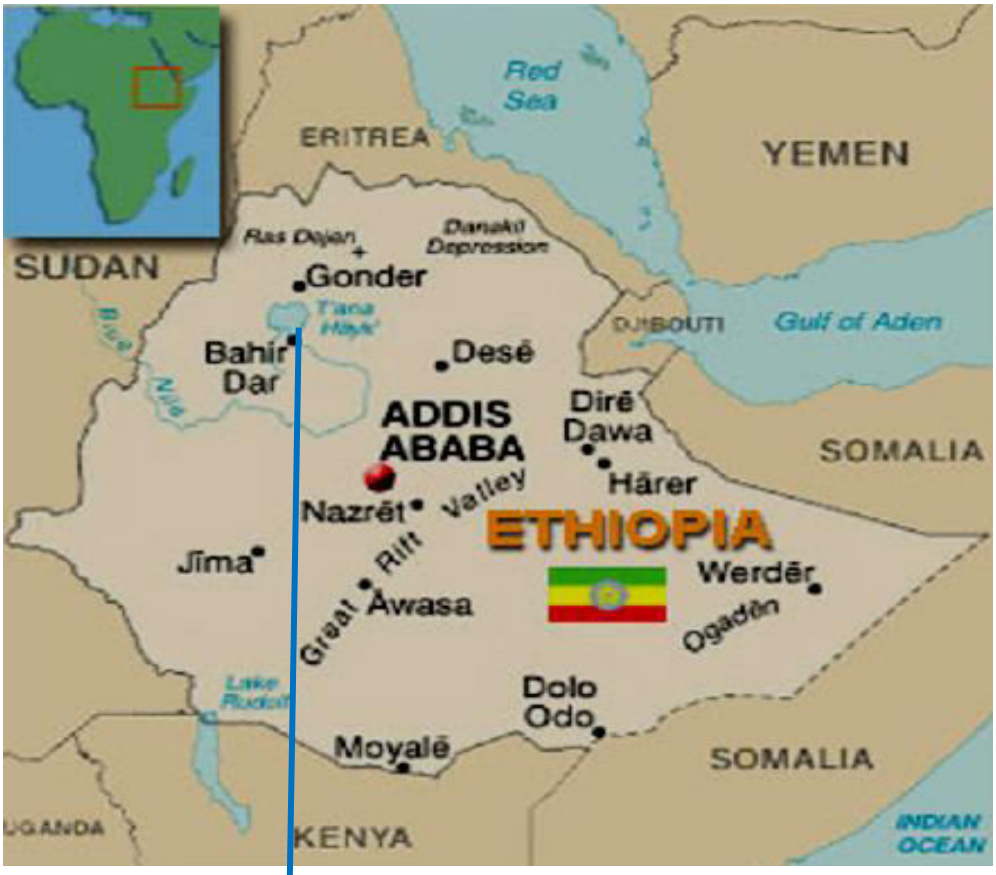
On the other hand, several studies documented that the role played by informal or traditional resource management and governance systems is vital for successful resource management and governance (Markelova and Swallow, 2008, German *et al*. 2010). A study conducted in Sub-Saharan African (SSA) countries reveals that informal institutions have contributed to achieving most of the sustainability outcomes because they acknowledge the local knowledge of the community in the process of sustainable CPR management and governance by creating a suitable environment for joint decision making, enabling exclusions at low cost for CPR users and using locally agreed sanctions. Whereas formal institutions in most cases contributed less to sustainable CPR management and governance due to several factors such as unclear responsibilities, mandates, and power sharing in the decentralization reforms, and their low endurance to change with political conditions (Yami *et al*. 2009).

A typical example here is the *Guasa* area indigenous natural resource management and governance system in *Amhara* regional state. The common-property resource system in the *Guassa* area of *Menz*, in the Central Highlands of Ethiopia, has continued since 1975 to protect local livelihoods, as well as endemic and threatened biodiversity. The *Guassa* area is managed and governed by the *Menz* community as a common-property resource area. The community continues to protect the area by enacting various bylaws, which restrict community use of the natural resources; without any formal protection status, this indigenous resource management system was structured under an indigenous resource management institution.

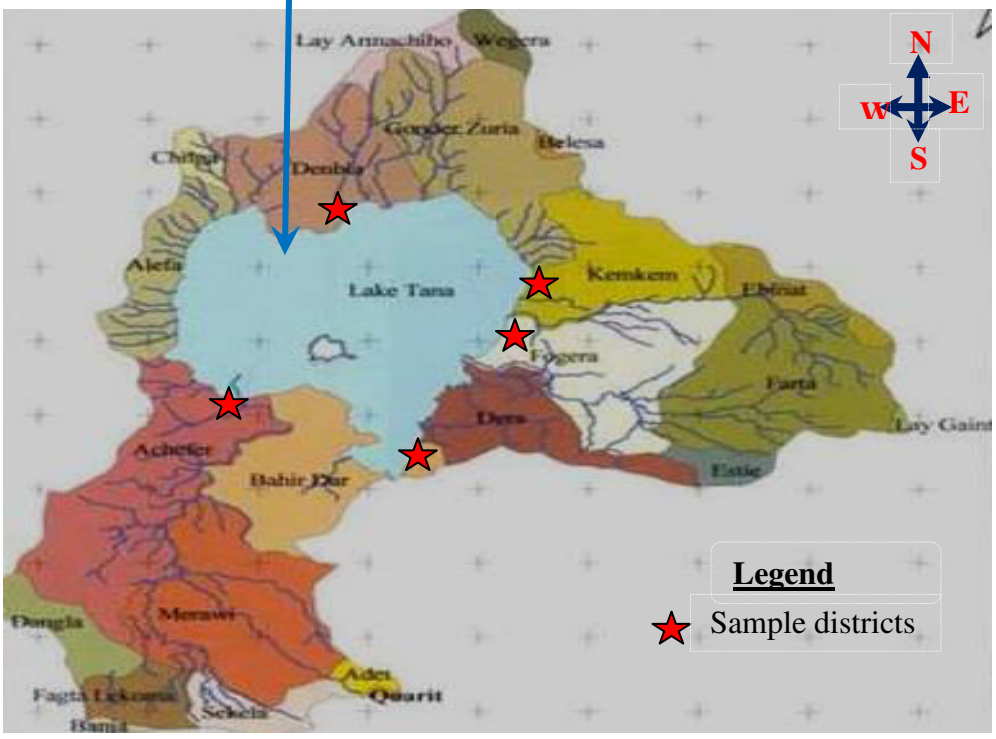
However in recent times, the common-property resources of *Guassa* area are now managed by the newly formed peasant associations (PAs- the lowest government structures) which are structured on the basis of geographical location and the premise that 'everybody is equal' rather than on the old system based on kinship and parishes, both of which are tremendously important to communal belief, trust and unity. This has resulted in the erosion of the sense of 'belongingness' in the community, and created tensions and conflict between the old and the newly authorized users and managers (Ashenafi and Leader-Williams, 2005).

Wakjira *et al*. (2013) indicated that *Harenna* forest in the Southern part of the *Bale* Mountains of *Oromiya* regional state has been governed by local informal institutions. Despite repeated and profound changes in the governance approaches for Ethiopia, local-level traditional institutions governing the use of forest coffee, beekeeping and livestock grazing have not fundamentally altered for more than 150 years. However, these traditional institutions have experienced numerous modifications in recent times. They further argued that major factors causing or triggering such adaptations included; the imposition of formal governance systems from the central government that undermined the previously existing informal institutions (like the *Gada* system), an increasing number of inhabitants and thus potential forest users, and an increasing value of resources.

Recently, Yami *et al*. (2013) also reported the existence of informal institutions where village bylaws devised by communities govern the management of enclosures. They found that the informal institutions played important roles in mobilizing the CPR users for collective action in CPR management and governance in the Northern Ethiopian context. The village bylaws in Southern *Tigray* regional state mitigated forest degradation by facilitating users to have common goals in the management of enclosures, and resolved the conflicts among users by using monetary sanctions including penalties.



a) Map of Ethiopia



b) Lake *Tana* sub-basin

Figure 3.2: Map of the study area (Ethiopia and Lake *Tana* sub-basin)

3.2.3 *Amhara* National Regional State

The *Amhara* National Regional State (ANRS) is one of the 9 ethnically based administrative regions of Ethiopia. The region is geographically located in the north-western part of the country between 9^{o} -13^{o} 45'N latitude and longitude of 36^{o} -40^{o} 30'E. With an estimated area of 154,708.96 square kilometers, this region has an estimated density of 121.9 people per square kilometer. Based on the 2007 population and housing census, the Central Statistical Agency of Ethiopia (CSA) estimated the population of *Amhara* region to be 18, 866,002 in July 2012 of whom 9,461,005 are men and 9,404,997 women.

Agriculture is the dominant economic sector in the region and biggest employer of the economically active population. It accounts for 63.1% of the regional GDP and 89% of the population derives its livelihood from agriculture and allied activities. Agriculture in the region is characterized by extremely small holdings, mostly private peasant holdings, dispersion of crop land holdings, traditional farming and low level of literacy among the holders (CSA, 2003; BoFED, 2004). It is the major source of food, raw materials for local industries, and export earnings. Crop production and animal husbandry are the major agricultural activities undertaken in the region. Crops such as cereals, pulses, oil seeds, fibers, and roots crops are grown in different parts of the Region. Major crops include maize, sorghum, potato, bean, wheat, and barley in the highlands, and *teff* (*Eragrostis tef)*, cotton and sesame in the lowlands. Small-scale subsistence cultivation is the dominant agricultural practice, and ancient methods of land preparation and harvesting continued to be applied. Absence of relevant agricultural technologies, combined with a low level of extension services, contribute toward low productivity and production levels.

The region is endowed with a huge natural resource potential including the world-renowned Nile River and its source, Lake *Tana* together with its historical monasteries as well as historical sites such as the *Gondar* Castle, the rock-hewn churches of *Lalibela*, *Tis issat* fall, the Semen Mountain etc.

3.2.4 The research locations: Lake *Tana* and sample districts

Lake *Tana*

At 12°N, 37°15′E, and 1,830 m altitude, Lake *Tana* is situated on the basaltic plateau of the north-western highlands of Ethiopia covering an area of about 3,050 km^2 stretching 84 Km north-south and 66 Km east-west. Its maximum depth is 14m with a decreasing trend due to siltation and lowering water level. The lake is believed to have originated two million years ago by volcanic blocking of the Blue Nile River (Mohr, 1962; Baker *et al*. 1972). It assumed its present shape through blocking of a 50 km long quaternary basalt flow, which filled the exit channel of the Blue Nile River (Chorowicz *et al*. 1998). However, a recent seismic survey reveals that there are strong evidences that Lake *Tana* had dried up between 16,000 and 50,000 years ago (Lamb *et al*. 2007). Lake *Tana* is the largest freshwater lake in the country and the third largest in the Nile Basin which contributes about 85% of the Nile water. It supports huge livelihood and development activities. The aesthetic value of the lake coupled with the historic monasteries on its islands, have added to its use value through the development of tourism and the growth of inward investment.

The sub-basin area of the lake at its outlet is 15,321 km^2 of which about 20% is covered by the lake itself. More than 40 rivers (some researchers reported 60 rivers) and streams flow into the lake, but 93% of the water comes from four major rivers: *Gilgel Abbay*, *Ribb*, *Gumara* and *Megech*. The mean annual inflow to the lake is estimated to be 158 m^3s^{-1} (i.e. 4,986 Mm^3y^{-1}). The mean annual outflow is estimated to be 119 m^3s^{-1} (i.e. 3,753 Mm^3y^{-1}) (SMEC, 2008). This basin is of critical national significance as it has great potential for irrigation; hydroelectric power; high value crops and livestock production; ecotourism and others (Setegn, 2010) and it is one of the growth corroders selected by the Ethiopian government to accomplish the ambitious Growth and Transformation Plan (GTP).

The total population in the lake catchment was estimated to be in excess of 3 million in 2007 (CSA, 2003). The largest city on the lake shore, *Bahir Dar*, has a population of over 200,000 and at least 15,000 people are believed to live on the 37 islands in the lake. Most islands in Lake *Tana* are small, but two of them are larger (*Daga estifanos*, and *Dek*, which used to be the seat of Ethiopian emperors). The majority of the population depends for their livelihoods on rain fed agriculture. Fishery is an integral part of their livelihood both for household consumption and income generation. Despite the huge potential, there is very little irrigated agriculture in the sub-basin. During the rainy season, *Dembiya* from the North, *Fogera* and *Libokemkem* from the East form extensive floodplain wetlands of the lake. Recession cropping, mainly for maize and rice, is carried out in the wetlands adjacent to the lake shore (Awulachew *et al*. 2009).

Lake *Tana* ecosystem is important in ecological and economic terms, and it has both local and global significance. It is an important source of fish both for the people immediately around the lake and elsewhere in the country (Awulachew *et al*. 2009). Its unique and isolated landscape includes forested islands, immense and varied wetlands and high mountain areas. The region is renowned for its biodiversity, and it is also the home of churches and monasteries dating from the 14th to the 16th century. As a result of the high heterogeneity in habitats, the lake and surrounding riparian areas support high biodiversity and are listed in the top 250 lake regions of global importance for biodiversity(McCartney *et al.* 2010). About a quarter of the 65 fish species found in the lake are endemic. The lake contains eighteen species of *barbus* fish (i.e. of the *Cyprinidae* family) and the only extended cyprinid species flock in Africa (Eshete, 2003).

Ninety per cent of the area's rapidly growing population of 2.5 million people depends on subsistence agriculture for their livelihoods. The productivity and sustainability of mixed farming practices depend on ecosystem goods and services, which rely on the functional integrity of the Lake's ecosystems- rivers, wetlands, lake, forests, pastures and soils. However recent research reports show that the integrity of the overall ecosystem has been undermined and continues to be under serious threat.

Sampled districts

Recently, the former *Achefer* district was split into North and South *Achefer*. North *Achefer* is situated about 560 km north of Ethiopia's capital city, Addis Ababa. The study area within North *Achefer* has geographical boundaries between 11^{o} 00' 40" to 11^{o} 38' 00" North and 36^{o} 48' 00" to 37^{o} 01' 35" East. It is part of the West *Gojam* Zone which is bordered on the south by South *Achefer*, on the west by North *Gondar*, on the north by Lake *Tana*, on the north-east by *Bahir Dar Zuria* and on the south-east by *Merawi*. Lake *Tana's* tributary rivers within this district include the Lesser *Abbay* (locally called '*picolo Abbay'*, *Gilgel Abbay* to mean small *Abbay*) and it defines the area's Eastern boundary. The district includes *Dek* Island. The administrative center is *Yesmala*; other towns in *Achefer* include *Durbete*, *Kunzela* and *Wandege*. According to the Central Statistical Agency (2007), in July 2012 North *Achefer* has an estimated total population of 206,658, including 105,451 males and 101,207 females (see Table 3.1).

Bahir Dar zuria district is found in the south shore of Lake *Tana*. With an estimated total population of 196,766 in July 2012, of whom 100,834 and 95,932 are male and females (CSA, 2007), the district is sub divided in to 38 *kebeles (*the lowest unit of administration*)*. Farming and fishing are the most common occupations outside *Bahir Dar* town. A survey of the land in this district show that 21% is arable or cultivable, 9% pasture, 8% forest or shrub land, 36% covered with water, and the remaining 26% is considered degraded or other. The topography of the district comprises of 48% plain and 45% rigid and 7% valley bottom.

Dembiya district is found in North *Gondar* Administrative Zone, North of Lake *Tana*. Based on figures published by the Central Statistical Agency in 2007, the district has an estimated total population of 295,423 in July 2012, of which 150,347 are men and 145,076 women. The district is divided into 40 rural and 5 urban *kebele*s. More than 10 *kebele*s have wetland along the shore of Lake *Tana*. Rivers within this district include the Lesser *Angereb* and *Derma*, which flow south into Lake *Tana*, and the *Atbarah.* The topography of the district comprises of 87% plain and 13% rigid. A survey of the land in this district shows that 64% is arable or cultivable and another 25% under irrigation, 6% pasture, 4% forest or shrub land, and the remaining 1% is considered degraded or other.

Fogera district has an estimated total population of 249,826 in July 2012(CSA, 2007) of whom 127,286 are males and 122,540 are females. It is located on the south-eastern shore of Lake *Tana*. The capital of the district is *Wereta,* some 625 km from Addis Ababa and 55 km north of the Regional capital of *Bahir Dar*. The district is divided into 25 rural and 5 urban *kebeles* and has a land area of 117,414 ha, out of which 9,602.36 ha is grazing land. Flat land accounts for 76%, mountain and hills 11% and valley bottom 13%. Some 55% of the land of the district is cultivated; 29% is pasture land. The district borders Lake *Tana* and has an estimated water body of 23,354 ha. Altitude ranges from 1,774 to 2,410 m.a.s.l. It is situated at $11^{0}58$ latitude and $37^{0}41$ longitudes. The mean annual rainfall is 1,216.3 mm and average temperature is 19°C (IPMS, 2005).

The area is well endowed with diverse natural resources and is one of eight districts bordering Lake *Tana.* There are two major rivers of great economic importance to the district, the *Gumara* and the *Ribb*. The area mainly consists of a flat, open plain across which the *Ribb* River flows into Lake *Tana*. The *Gumara* River forms the southern boundary. Both rivers originate from the high plateau to the East, and as they reach the plains the gradient decreases and they form meanders. During and after the rainy season, as the *Ribb* River approaches the level of Lake *Tana*, water overflows its banks and floods the surrounding area. The perennial *Gumara* River also overflows its banks as it approaches the Lake, but causes less flooding than *Ribb* (Fishpool and Evans, 2001).

Libokemkem district is found in South *Gonder* Administrative Zone, East of Lake *Tana*. The capital of the district is *Addis Zemen* Town which is located 81km North of *Bahir Dar*. The district is divided into 32 *kebeles*. It extends from a latitude of 37°15‘36” E to 38°06‘36” E and from a longitude of 11°54‘36” N to 12°22‘48” N. According to the Central Statistics Agency, the district has an estimated total population of 217,029 in July 2012 (CSA, 2007) including 110,407 males and 106,622 females. The area receives a uni-modal rainfall of approximately 1300 mm per year, the majority of which falls between June and August. The mean annual temperature in the area is 19.7ºC.

Table 3.1: Population and land area of sampled districts

Characteristics	Sampled District				
	North Achefer	***Bahir Dar Zuria***	***Dembiya***	***Fogera***	***Libokemekem***
Population	206,658	196,766	295,423	249,826	217,029
Land Area (km^2)	1,152.43	1,443.37	1,261.96	1,111.43	999.71
Density per km^2	179.3	136.3	234.1	224.8	217.1
% area in the sub-basin*	100	80	100	100	60

Source: Central Statistics Authority (CSA, 2005 estimated as of July 2012)
** MoWR, 2005*

3.3 Research Methods

3.3.1 Research design

In order to investigate the research objectives, the research approach needed to integrate exploratory and descriptive research frameworks. Therefore, to better understand the complex human-nature interaction of Lake *Tana* sub-basin, a combination of a descriptive quantitative approach and case study research using qualitative methods was seen as the most suitable research approach. Particularly, the qualitative approach affords an in-depth analysis of complex human cultural experiences and their interaction with the natural system in a manner that cannot be fully captured with measurement scales and multivariate models (Plano *et al*. 2008).

The main arguments for choosing case studies for this research however are the descriptive and exploratory nature of the research (not requiring control of behavioral events but rather describing and documenting them) and the dominance of 'how' (and exploratory 'what') questions (Weerd-Nederhof, 2001). More importantly, as many researchers argues, unlike other qualitative designs such as grounded theory and ethnography, the case study approach is open to use of theory or conceptual categories that guide the research and analysis of data.

Situation analysis methodology was applied to the research setting: this helped to understand the broad context of human-nature interaction, particularly the status, trends and key issues affecting local people and their livelihoods, ecosystems or institutions in Lake *Tana* sub-basin and the CPR context at different levels (local, national, regional and international). A situation analysis is a process that helps to create understanding of the Lake *Tana* sub-basin including the natural environment, the social, economic, political and institutional systems that affect the overall natural resource management and governance system of the sub-basin. Situation analysis is important to: (i) clearly identify the needs and concerns, interests and power of all stakeholders, (ii) ensure whether multi-stakeholder interaction is appropriate to the situation or not, (iii) assess the likely consequences of the multi-stakeholder process within its wider context, (iv) assess situational factors that will influence the implementation phase of the multi-stakeholder process and effectiveness (WUR, 2012).

Towards this end, this research addresses the issue of institutional arrangements and CPR use, management and governance by using a combination of analytical tools including the modified Institutional Analysis and Development (IAD) framework (Ostrom *et al*. 1990) and Interactive Governance framework (Kooiman *et al*. 2008) to describe the CPR governance environment and to better understand the action situation where multi-stakeholders are interacting with an outcome that eventually has an impact on CPR systems. The modified IAD framework is used as an evaluation and diagnostic tool, focusing on both the process of resource management, governance and its outcomes. The framework is used to separate the underlying rules (institutions) from the strategy of the players (organizations) and to understand how and to what extent rules and regulations enacted at constitutional level are enforced to affect the behavior and outcomes achieved by resource user and grassroots stakeholders. In addition, the Interactive Governance framework is used as an integrated and comprehensive lens to see the overall governance system of Lake *Tana* sub-basin from three broad perspectives namely; system to-be-governed, governing system and governance interaction. This approach is used to assess the governability of CPRs by analyzing the natural and human systems in an integrated manner. It is also used as a prescriptive tool in that it helps determine gaps and potential interventions to improve the CPR management and governance system in the sub-basin (for details see section 2.6 of previous chapter).

3.3.2 Sampling design and technique

This study is based on a survey conducted from February to March 2011 in 5 districts bordering Lake Tana, namely North *Achefer, Bahir Dar Zuria*, *Dembiya, Fogera and Libokemkem.* The sample households were selected by utilizing a three-stage sampling procedure. The first stage involved the purposive selection of 5 districts (North *Achefer, Bahir Dar Zuria*, *Dembiya, Fogera and Libokemkem)* out of the 8 districts bordering Lake *Tana* based on their percentage area coverage of the district in Lake *Tana* sub-basin (see Table 3.1), tributary river passing through the district, having an extended wetland and good market access.

At the second stage, in consultation with district experts and local development agents, 7 *kebeles* namely *Kunzila*, *Gonbat*, *Achera*, *Nabega*, *Kidisthana*, *Tezamba* and *Agidkiregna* were purposely chosen from the above mentioned districts. These *kebeles* were selected based on the presence of an extended wetland and/or located alongside major tributary rivers (*Gilgel Abbay*, *Gumara*, *Ribb*, Lesser *Abgereb* and *Derma*). Another consideration taken in the selection process of *kebeles* was to select areas adjacent to Lake *Tana*. Moreover, *Fogera* and *Libokemekem* districts share one of the Lake *Tana*'s tributary rivers (*Ribb*) and become the source of conflict among users of these districts, therefore to better understand the common-pool resource situation, two additional adjacent *kebeles* (*Nabega*-from *Fogera* and *Tezamba*- from *Libokemekem*) were selected purposively.

At the third stage, a household list of residents residing in each selected *kebeles* was obtained from respective *kebele* administrations. Then, a total of 200 sample respondents were selected randomly from a total of 7 *kebeles* based on their proportion to size (see Table 3.2).

Table 3.2: Sampling of respondents based on the CSA, 2007 population census

Sampled Districts	Sampled *Kebeles*	No of Total HHs	No of Sampled HHs
North Achefer	*Kunzila*	1,153	23 (11.5%)
Bahir Dar Zuria	*Gonbat*	1,235	25(12.5%)
Dembiya	*Achera*	799	16(8.0%)
Fogera	*Nabega*	2,283	46(23.0%)
	Kidisthana	1,790	36(18.0%)
Libokemkem	*Tezamba*	1,040	21(10.5%)
	Agid-kiregna	1,599	33(16.5%)
Total		**9,899**	**200**(100%)

Source: own survey, 2011

3.3.3 Method of data collection

In order to acquire the data to address the research questions, primary as well as secondary and qualitative as well as quantitative techniques of data collection were applied. Data for this study were drawn from five main sources: (i) Focus group discussions (ii) Key informant interview (iii) Stakeholder identification and analysis workshop (iv) Household survey (v) Unstructured observation and (vi) Secondary data sources.

3.3.3.1 Primary data

Primary data were collected during 2010 and 2011 using focus group discussion and key informant interviews (see Appendix 5), stakeholder identification and analysis workshop, semi-structured interview schedule (see Appendix 4) and unstructured observation.

i) Focus Group Discussion

Since one goal of the research was to emphasize the ways in which individuals collectively make sense of the socio-economic, institutional and environmental issues related to Common pool resources, it was important to conduct focus group discussions among resource users (particularly fishers and subsistence farmers), development agents and *kebele* administrators. Accordingly it was imperative to understand how people respond to each other's views and build up a view out of the interaction that takes place within the group (Bryman, 2012). A series of Focus Group Discussions (FDGs) were conducted with community members, district experts and *kebele* administrators selected from more than 8 districts and 35 *kebeles*

bordering Lake *Tana*. Most of the group discussions were conducted by superimposing on different community awareness creation training sessions conducted on 'Sustainable Wetland Management and Use' training organized by Bureau of Environmental Protection Land Use and Administration (Bo-EPLUA) at *Dangila*-42 participant (from January 27-29, 2011), *Maksegnit*-38 participants (from January 30-February 1, 2011) and *Wereta*-32 participants (from June 22-24, 2011).

Across all the 3 training sessions conducted at different periods and places (at *Dangila*, *Maksegnit* and *Wereta*) a total of 6 sub-groups were formed. In each training places, after the training session, participants were divided into 2 small sub-groups consisting of approximately 16-21 participants. Two moderators including the researcher ran and guided the focus group sessions with a great precaution not to be too intrusive and with minimal intervention. The moderator has to straddle two positions: allowing the discussion to flow freely and intervening to bring out especially salient issues, particularly when group participants do not do so. The moderator also has an important role in encouraging those who have not said much and discourage systematically opinion leaders who dominate the discussion (Bryman, 2012). Each session lasted approximately one hour and was tape-recorded. The outcomes of each sub-group's discussion were presented and discussed with whole participant.

ii) Key informant interview

In total 24 key informant interviews (3-regional government officials, 8-experts from different districts, 5-cooperative members and 8-community elders at different districts) were conducted. Particularly community elders, who are knowledgeable of the historical trends, existing rules and regulations, and overall situation of Lake *Tana* sub-basin CPR system, were selected by community members. Checklists were used for both focus group discussion and key informant interview (see Appendix 5).

iii) Stakeholder identification and analysis workshop

The general purpose of stakeholder identification and analysis may be seen as providing a methodology for better understanding environmental and development problems and interactions of a given system through comparative analysis of the different perspectives and sets of interest of stakeholders at various levels (Grimble and Wellard, 1997). The basic premise behind stakeholder identification and analysis was primarily to generate knowledge about the relevant stakeholders so as to understand their behavior, intentions, interrelations, agendas, interests and the influence or resources they have brought or could bring to bear on CPR use and rule making processes, to identify different categories of stakeholder and anticipate the kinds of influence they could exert on the management and governance of CPRs, potential areas of synergy, collaboration, potential conflicts of interest among stakeholders and between stakeholder groups.

A two days stakeholder identification and analysis workshop was conducted from February 26-27, 2011 at *Wereta* town (*Fogera* district). Since resources, time, and finance for this research were limited, the participants from different stakeholder groups were prioritized. Therefore, participants (who may have important knowledge about or perspective on the issues) were selected purposively from different organizations representing different stakeholder groups (Governmental, Non-Governmental, Academic and Research) and various disciplines (for instance ecologists, environmentalists, hydrologists, fishery experts, animal scientists and economists) (see Appendix 1). In addition, representatives from NGOs who are working in relation to natural resource management (for example, Ethiopian Wetlands and Natural Resource Association- EWNRA) and experts from districts were involved. However, it was too difficult to bring local people (the majority of whom are illiterate) together with the panel of experts in the workshop. Therefore, in order to capture the views of resource users and their interaction with other relevant stakeholders at grassroots level focus group discussions with resource users at different districts were held (see Figure 3.3-a).

Different groups have different concerns, capacities and interests in and power over CPR management and governance. Therefore, these need to be explicitly understood and recognized in the process of CPR use, management and governance. The analysis yielded useful and accurate information about those individuals, groups and organizations that have an interest in and power over CPRs (water, fish and wetlands) of Lake *Tana* sub-basin. The information generated from the analysis is also important for making decisions on which stakeholders ought to be involved in CPR use, management and governance decisions in Lake *Tana* sub-basin. As noted by different scholars (Grimble and Wellard 1996; Engel, 1997; Roling and Wagemakers, 1998 cited in Ramirez, 1999) the reasons for carrying out stakeholder analysis are; i) empirically to discover existing patterns of interaction; ii) analytically to improve interventions; iii) as a management tool in policy making; and iv) as a tool to predict conflict. For this study the primary focus is on the first and forth reasons. A stakeholder analysis also helps to identify whom to interview first.

For this research, a stakeholder is defined as: an organization, group or individual that is concerned with or has an interest in and control over CPRs (water, fish and wetlands) and that would be affected by decisions about CPR use, management and governance. A number of possible tools such as Stakeholder Matrix, SWOT Matrix, spider diagram and useful frameworks such as importance/influence matrix (used to map out the relative interests/stake value and power level of key stakeholders) (Matsaert, 2002) were used. Particularly, matrices were used, in which stakeholder groups appear on one axis and a list of criteria or attributes appear on the other. For each overlapping area, a qualitative description or quantitative rating were given (Ramirez, 1999). After a brief explanation of the overall concepts and definitions of CPRs, stakeholders, stakeholder analysis, tools for stakeholder identification and analysis, a flexible set of steps for conducting stakeholder analysis as suggested by Grimble *et al*. (1995); Grimble (1998) and Schmeer (1999) were followed for this research. These are:

Step 1. Identify the main purpose of the analysis;

Information generated from stakeholder identification and analysis may serve several purposes: to provide input for other analyses (institutional analysis, the main objective of this research); to inform the development of action plans, policy reform or institutional change to increase sustainable management and governance of CPRs (the expected outcome of this research as a recommendation); or to identify ways to guide a participatory, consensus-building process in conflicting situations.

Step 2. Develop an understanding of the system and decision-makers in the system

The sorts of questions that were addressed at this stage include how stakeholders use and manage the CPR in question. For example, what direct goods and services do they extract from the CPRs? What indirect (including environmental) goods and services do they provide? What restrictions do they face over the use of CPRs? What *de jure* and *de facto*[9] rights or claims do they have over using and managing the CPRs? What are the forms and degree of management of the CPR in question?

Step 3. Identify principal stakeholders

A list of possible stakeholders with input from participants was developed. All stakeholders, who could have an interest in and control over the selected CPR situations (water, fishery and wetland) including stakeholders outside this situation that could affect or be affected by those actions were identified. Potential stakeholders in different sectors, geographic or administrative areas within Lake *Tana* sub-basin were also considered; experts who know the sector (water, fishery and wetland), policy, CPR situations and players in and around Lake *Tana* helped a lot in this process.

[9] *De jure:* means according to law, by right, legally
De facto: means actual, exercising power or serving a function without being legally or officially established.

Some of the questions asked at this step include:

- Who uses the resources? Who is most dependent on the resources at stake? Is this a matter of livelihood or economic advantage?
- Who has the rights and responsibilities over the use of the resources? Who possesses claims-including legal jurisdiction and customary use-over the resources at stake? Are several governmental sectors and ministry departments involved? Are there national and/or international bodies involved because of specific laws or treaties?
- Who impacts on the resources, whether positively or negatively?
- Who are the people or groups most knowledgeable about, and capable of dealing with, the resources at stake? Who is managing these resources? With what results?
- Are the stakeholders and their interests geographically and seasonally stable, or are there migration patterns?
- Are there major events or trends or have there been currently affecting the stakeholders (e.g., development initiatives in and around Lake *Tana*, land reforms, migration, population growth)?

Step 4. Investigate stakeholder interests, power, characteristics, and circumstances

For each stakeholder, participants were asked to estimate how much value they place on each stakeholder's stake or interest in the CPR use, management and governance system. The value can be positive or negative or both (i.e. their stake may be to affect the system positively (+) or negatively (-), or both). The values were 1-5, 1 denotes non-essential and 5 denotes critical. At the same time, participants were assigned a power level to each stakeholder. The power levels were from 1-6, where 1 denotes lowest and 6 denotes complete control. This rates the ability of the stakeholders to take effective action and ensure their stake. Then the value of the stake to the stakeholder was multiplied by the power to take action. The result was an indication of the stakeholder's likely impact on CPR management and governance in Lake *Tana* sub-basin.

Step 5. Investigate patterns of interaction and dependence.

Stakeholder's attributes (powers to influence the action situation and legitimacy of a stakeholder's relationship to the action situation) were investigated. Interactions between stakeholders and differing groups of stakeholders were partly a function of the degrees of power and influence that groups have, including key organizations. Such links may take a variety of forms-conflict, co-operation and dependency- with corresponding opportunities for resolution, analysis of trade-offs and synergies. After a careful assessment of the interest-power level of each stakeholder participants were allowed to identify criteria to evaluate the organizational capacity of the most influential stakeholders in Lake *Tana* sub-basin. Accordingly eight assessment criteria were identified and used. In addition to identifying patterns of interaction, the workshop participants were asked to identify the reasons behind conflicts, complementary actions and co-operation, both to increase understanding of a specific situation and to be able to draw general lessons about what factors are likely to lead to conflict or successful collective action.

iv) Semi-structured interview schedule

Semi-structured interview schedule was used to gain a range of insights on both quantitative and qualitative information from a sample of respondents. The household survey was conducted to gain insights and understand the demographic, socio economic status, livelihood activities (important sources of community livelihoods and their reliance on CPRs), ways of using and managing the CPRs, formal and informal CPR governance rules perceived by individuals, the structural and proximate causes, trends and management of conflict over resources.

A. Interview schedule development

A comprehensive interview schedule comprising of both closed and open ended questions, so as to allow the gathering of quantitative and qualitative information was prepared. The interview schedule included such topics as demographic characteristics of respondents, livelihood sources, common pool resource use pattern and management, knowledge and perception of the institutional environment. The detailed interview schedule is presented in Appendix 3.

B. Enumerators training, pre-testing and semi-structured interview

For the semi-structured interview, 15 Enumerators and 3 supervisors were selected based on their professional proximity to natural resource management. Two days of training on the concepts, definitions of CPRs and the contents, approaches and instruments of the survey was provided to all enumerators and supervisors. Before the actual implementation of the survey, interview schedule was pre-tested in 2 nearby villages as part of the training session. The purpose of pre-testing the interview schedule was to expose the enumerators to a real life interview situation as well as to get feedback on the interview schedule for further amendment. Therefore, based on the feedback, amendments were made to the interview schedule and the final version was completed. From March 2-22, 2011 and October 10-30, 2011, semi-structured interview were conducted with 200 sample respondents.

v) Unstructured Observation

Observation provides direct access to the social phenomena under consideration. Instead of relying on some kind of self-report, such as asking people what they would do in a certain situation, the researcher actually observes and records their behavior in that situation (University of Strathclyde, 2013). In this study naturalistic and narrative methods of observation were used. These methods are a type of unstructured observation which was carried out in real-world settings that attempt to observe things 'as they are', without any intervention or manipulation of the situation itself by the researcher and attempt to 'tell the story' of what is happening in a given situation (University of Strathclyde, 2013). Recording sheets and check lists, observation guides and field notes were used as data collection methods. In addition, with a careful ethical consideration (like requesting permission and convincing the subjects), photo and video cameras were used. However, precautions were taken to avoid the researcher's biased towards the phenomenon under consideration. Subjective bias on the part of the observer (in this case the researcher) was triangulated by other means of data collections (such as key informant interview).

3.3.3.2 Secondary data

Primary data collected from focus group discussion, stakeholder identification and analysis workshop, key informant interviews, household survey and unstructured observation were supplemented by a documentary analysis at all levels of organization (at national, regional and district level) and literature review. The documentary data sources include: research publications and reports; policies, proclamation; legislation; administrative/executive regulations or orders; compensation arrangements; guidelines/advice; meeting reports and minutes. The legal and administrative framework for natural resource management and changes during 1990-2011 were identified by searching official documents and the scientific literature. Particularly, the legislative and policy environment that can impact critically on the CPR context were reviewed.



(a) **(b)**

Figure 3.3: Focus Group discussion (a) and Stakeholder Analysis workshop, 2011 (b)

Source: The Author (2011)



(c) **(d)**

Figure 3.4: Enumerators training (c) Household survey supervision (d)

Source: The Author (2011)

3.3.4 Methods of data analysis

Quantitative measures of the causes or consequences of institutional arrangements and their change are difficult to develop; even when they are available, better evidence may come from the qualitative historical record (Alston *et al*. 1996). Arguably, while econometric analysis may be useful in delineating specific factors that determine the causes or driving forces of institutional changes, performance and their effect on common-pool resource management, it does not help much in analyzing processes of institutional origin and changes, attitudes of different stakeholders and conflict resolutions and management systems. Hence, qualitative and descriptive analysis were used to analyze the current state and dynamics of CPRs and policy implications for livelihood security and sustainable CPR use, management and governance, to identify the trends in conditions and describe the pressures being exerted on Lake *Tana* environment in general and CPRs in particular, identify institutional arrangements and enforcement mechanisms to govern common-pool resources.

Most data analyzed in this research were generated through a series of semi-structured in-depth qualitative and quantitative interviews, stakeholder identification and Analysis workshop, focus group discussions and key informant interviews conducted from September 2010 to December 2011. Following the household survey data collection, data were coded and entered in to SPSS software version 17. Simple descriptive statistics such as mean, standard deviation, frequency were used to analyze the socio economic variables of the respondents. For the analysis of data collected from semi-structured interviews that were administered to sample households, this makes reflection on background possible by enabling triangulation with the data from focus group discussions and key informant interviews.

Before the actual qualitative analysis, data collected from open ended questions and written comments on the household survey, testimonials, individual key informant interviews, tape recorded focus group discussions, observations (pictures), field notes, documents, reports, stories and case studies were translated into English, transcribed, coded, patterns and connections within and between categories were identified by using Word processing and Excel spread sheet. The different elements of evidence were used to develop narratives describing CPR situations. Qualitative data were analyzed using narrative data analysis and interpretation methods such as logical analysis, historical narratives and matrix analysis which outline generalized causation by using flow charts, spider diagrams to pictorially represent these; in addition written descriptions were used to understand the trends of resource use and interaction of stakeholders in resource management and governance of common-pool resources. Where relevant, secondary resources were consulted to triangulate and supplement the primary data sources.

For trends in resources management and governance, historical narratives and analysis were used to elicit the past events and conditions, to understand the CPR situation, why changes have occurred and why things are the way they are today. After initial identification of stakeholders, their stake value and power level were identified in a stakeholder identification and analysis workshop; for this purpose a computer based stakeholder Analysis Support tool developed under Rural Economy and Land Use (RELU) Program by Anil Graves was used. This tool allowed stakeholders to be classified in an ‘‘interest-influence’’ matrix, which displayed and map their attributes and inter-relationships in CPR management and governance (Reed *et al*. 2009).

3.4 Chapter summary

This chapter sought to give an outline of the research approach and techniques adopted by the study. The research project took a scientific approach that combines qualitative and quantitative approaches. A related challenge is the integration of knowledge from qualitative case study research with quantitative research. Quantitative analyses are often criticized for overgeneralization since they disregard context by hiding processes behind data and variables. In contrast, qualitative studies are questioned for being vague and not transferable to other cases. This asserts a dichotomy between quantitative (statistical, mathematical, computational) and qualitative (interpretative, dialectic) methods (Eisenack *et al*. 2006). This combination of methods, also referred to as triangulation, helps to overcome the limitations and weaknesses inherent in each type of method and contributes to the validation of research findings. Triangulation entails using more than one method or source of data in the study of social phenomena (Bryman, 2012).

The study sample (200 respondents) was achieved on a very limited budget and as such the time spent in the local communities was also limited. With this arrangement, it is likely that discussions with the community members were not as deep as they might have been required. Therefore complementing the household survey with other methods such as key informant interview, focus group discussion, stakeholder analysis workshop was very imperative. Particularly multiple case studies (such as water, fish and wetlands) were studied and compared in their totality (in this case Lake *Tana* ecosystem). Intensive case study typically focuses on a small number of cases and examines them in depth. This case-study strategy is well suited for close examination of complex empirical processes, for assessing the meanings actors attach to their actions (Ragin *et al*. 2003). Table 3.3 summarizes the research methodology used in the study.

Table 3.3: Summary of research methodology

Research Questions	Data sources and data collection methods	Data analysis	Addressed in Chapter
1. What are the current states and dynamics of CPRs and its policy implications for livelihood security and sustainable CPR use, management and governance?	• Household survey using semi-structured interview schedule	• Simple descriptive analysis (Using SPSS V.17 software) • Ranking and Likert scale	Chapter 4
	• A set of case studies • Focus Group Discussions • In-depth key informant interview • Unstructured observation • Review of relevant policy documents	• Trend and historical narratives and matrix analysis • Ranking	
2. Who are drivers of changes that affect CPR use, management and Governance?	• Household survey using semi-structured interview schedule • Focus Group Discussions • In-depth key informant interview • Unstructured observation	• Simple descriptive analysis	Chapter 5
3. Who are the key players in the process of CPR use, management and governance?	• Stakeholder Identification and Analysis Workshop • Focus Group Discussions • In-depth key informant interview	• Stakeholder Analysis Support tool • SWOT Analysis • Ranking	
4. Why do conflicts arise around CPR use, management and governance? What are the underlying causes of conflict and resolution mechanisms?	• Household survey using semi-structured interview schedule	• Simple descriptive analysis • Ranking	Chapter 7
	• A set of case studies • Focus Group Discussions • In-depth key informant interview	• Trend and historical narratives and matrix analysis • Ranking	
5. What are the existing institutional arrangements that govern the behavior of CPR users and what are the factors influencing the effectiveness of CPR management and governance system?	• In-depth key informant interview • Review of relevant policy documents and legislations • Stakeholder Identification and Analysis Workshop	• SWOT Analysis • Documentary Analysis • Spider diagram	Chapter 6 and 7
	• Household survey using semi-structured interview schedule	• Simple descriptive analysis	

Source: own presentation, 2012

CHAPTER FOUR

4. THE STATE OF LAKE *TANA* ECOSYSTEMS

4.1 Introduction

This chapter presents findings regarding the state of Lake *Tana* ecosystems. The findings give an impression for further analysis of institutional arrangements and CPR governance of the Lake *Tana* sub-basin. Understanding the big picture of the human environment nexus at a local level with its complex interactions in and across ecosystems as well as in and across human systems is essential if policy and action responses are to contribute to the goals of sustainable development and improved human well-being at different levels (Karkkainen, 2002; UNEP, 2011).

In this chapter an attempt has been made to analyze the state of Lake *Tana* ecosystem from a sustainable development perspective. This chapter will answer the question of what are the current states and dynamics of CPRs and the policy implications for livelihood security and sustainable CPR use, management and governance. It addresses the 'Physical/Ecological conditions' of the conceptual framework indicated in section 2.6 Figure 2.1. The data analysis and interpretations discussed in this chapter are derived mainly from secondary sources supplemented by focus group discussions, key informant interviews, personal observations[10] and household survey.

The chapter has three substantive sections, the first of which presents an overview of the state of Lake *Tana* and its ecosystems. The primary objective of this section is to explore the dynamics and the future challenges for sustainable development. The second and third discussion sections that follow will give further analysis of the state of fish and wetland sub-systems respectively. Both sections focus on the dynamics of resource use patterns and their implication for sustainable resource utilization and livelihoods of the local community and beyond.

[10] The researcher resides and works in the study area.

4.2 The Lake Tana sub-system: Exploring the dynamics and the future challenges for sustainable development

Lake *Tana* Ecosystem located in the north-west highlands of Ethiopia, has a global significance on which a huge livelihood, economic and socio-cultural groups are highly dependent. It is also one of 250 lakes identified by Lake Net[11] as having globally significant biodiversity (Barker, 2004). However, due to natural and human induced calamities, the Lake ecosystem is under severe threat. A recent decadal trend analysis of Lake *Tana* at four decade level (from 1968-2007) confirms that the water level was increasing for the first three decades and negative and declining for the last decade. The lowest depth was recorded in 2002/2003 and after that time onwards the level of Lake *Tana* was not able to restore to its original level. It was revealed that within the last 35 years more than 6.2% of the lake's area was converted to other land covers (Minale and Rao, 2011).

According to Vijverberg *et al*. (2009) despite the limited direct human influences on Lake *Tana*, both wetlands and surrounding catchment area have already been seriously damaged by human activities and most of the original forest in the upper stream of the watershed has disappeared. The littoral region and wetlands of the lake are currently under severe degradation by the local inhabitants. Especially the area covered by papyrus has been decreasing recently by the ever growing human population. The local community is harvesting papyrus reed roots during low water level to use it as fuel wood. Farmers are cultivating the wetlands when the water is retreating.

In addition, *Bahir Dar* is a rapidly growing town, a six times population increase up to 1,800,000 inhabitants is expected in the next 50 years (Teshale, 2003). Based on the 2007 census conducted by the Central Statistical Agency of Ethiopia (CSA), the city has a total population of 221,991, an increase of 130.90% over the population recorded in the 1994 census. The current practice of Lake shore investments and discharging untreated industrial and domestic waste into the lake is causing adverse effects on the quality of the lake water and other aquatic life particularly fish species. Furthermore, pollution from agricultural sources such as fertilizers, insecticides and herbicides are recently increasing.

[11] LakeNet- is U.S.-based nonprofit organization dedicated to bringing together people and solutions to protect and restore the health of the world's lakes.

In the outflow of the Blue Nile from the lake, a large dam (*Chara chara*) was constructed in 1995 with additional gates added in 2001, resulting in increased silt load and turbidity of lake water and reduced water levels. The purpose of the dam is regulation of outflow from Lake *Tana* for downstream diversion to the *Tis Abbay* hydroelectric power stations located 35km downstream of the dam. Though fed by more than 40 rivers and streams, more than 93% of the water comes from *Gilgel Abbay*, *Ribb*, *Gumara* and *Megech* rivers (SMEC, 2008). The Northern and Northwest part of the Lake sub-basin is drained largely by five rivers namely, *Ambagenene, Dirma, Megech* (being the major tributary contributing large proportion), *Gumaro* and *Arno-Garno* which accounts for 18% of the basin. *Ribb* and *Gumara* rivers that account for 28% of the basin drain the eastern portion of the basin. *Koga* and *Gilgel Abbay* are the two major rivers draining the southern portion of the basin which accounted for 30% of the basin (MoWR, 2005). However, the future of these tributaries may not be continuous feeding of the Lake *Tana*. *Koga* Dam is already completed and functional since 2010. Construction of more major dams around the major perennial tributaries of Lake *Tana* particularly at *Ribb*, *Gumara Megech*, and *Gilgel Abbay* are underway (Figure 4.1 and Table 4.1).

Water withdrawal from the Western part of the Lake is already on track. Further feasibility studies and identification of potential lake water withdrawal at different sites are taking place. For instance, *Tana-Beles* power generation (estimated 460MW) and irrigation project that solely depend on diverted water from the Western shores of Lake *Tana* through a canal (12km) in the western part around *Kunzila* and connected to *Beles* river was inaugurated in 2010 (see Figure 4.2). The project cost of 7 billion Ethiopian Birr was fully covered by the Ethiopian government and expected to serve the country without any major interruption for the next 25 years (since March, 2010). After generating hydropower, it is also expected to irrigate 130,000 hectares of land. Generally, the project administrators and some government officials are claiming that there is no significant negative impact on the Lake's water level and surrounding ecosystem however, the debate on the impact of those development initiatives and water withdrawal from the lake is still ongoing.

On the other hand, a number of recent studies suggest that future development will exacerbate pressure on the lake ecosystem. There will be a significant fall of the water levels and massive wetland degradation in Lake *Tana* sub-basin in response to the planned water withdrawal and other development interventions (Dargahi and Setegn, 2011; McCartney *et al*. 2010; Setegn, 2010). If all the planned development occurs (see Table 4.1), the mean water level of Lake *Tana* will drop by 0.44 meters (m), and the average surface area will decrease by 30 square kilometers (km^2) (i.e., 1%) and up to 81 km^2 (i.e., 2.6%) during some dry seasons. There will be prolonged periods of several years during which water levels will be much lower than they would be naturally. If environmental flow requirements (estimated to average 862 Mm^3y-1) are maintained in the reach containing the *Tis Issat* waterfall, the mean water level of the lake will reduce by a further 0.37 m and the average lake area will reduce by an additional 26 km^2. Without careful management these changes are likely to have severe ecological and social consequences (McCartney *et al*. 2010).

During the course of this study an invasive weed, water hyacinth (*Eichornia crassipes*) which floats on water by forming a huge mass that blocks light and damages the fish breeding and feeding sites has been identified and reported around adjacent districts of Lake *Tana*. Researchers speculate that, if it is not controlled urgently, the weed will have a dramatic negative impact on the Lake's ecosystem. The species reproduces very fast and enhances evapo-transpiration which eventually reduces the water volume. In due course, it might have the potential adverse effect on the Lake ecosystem and cover the whole lake surface within short period of time. Eventually it may also have negative impact on the Grand Ethiopian Renaissance Dam (also known as Grand Millennium Dam) which is currently under construction on Blue Nile River about 40 Km East of Sudan in the *Benishangul-Gumuz* Region of Ethiopia. With 6,000MW, the dam will be the largest hydroelectric power plant in Africa when completed as well as the seventh largest in the world.

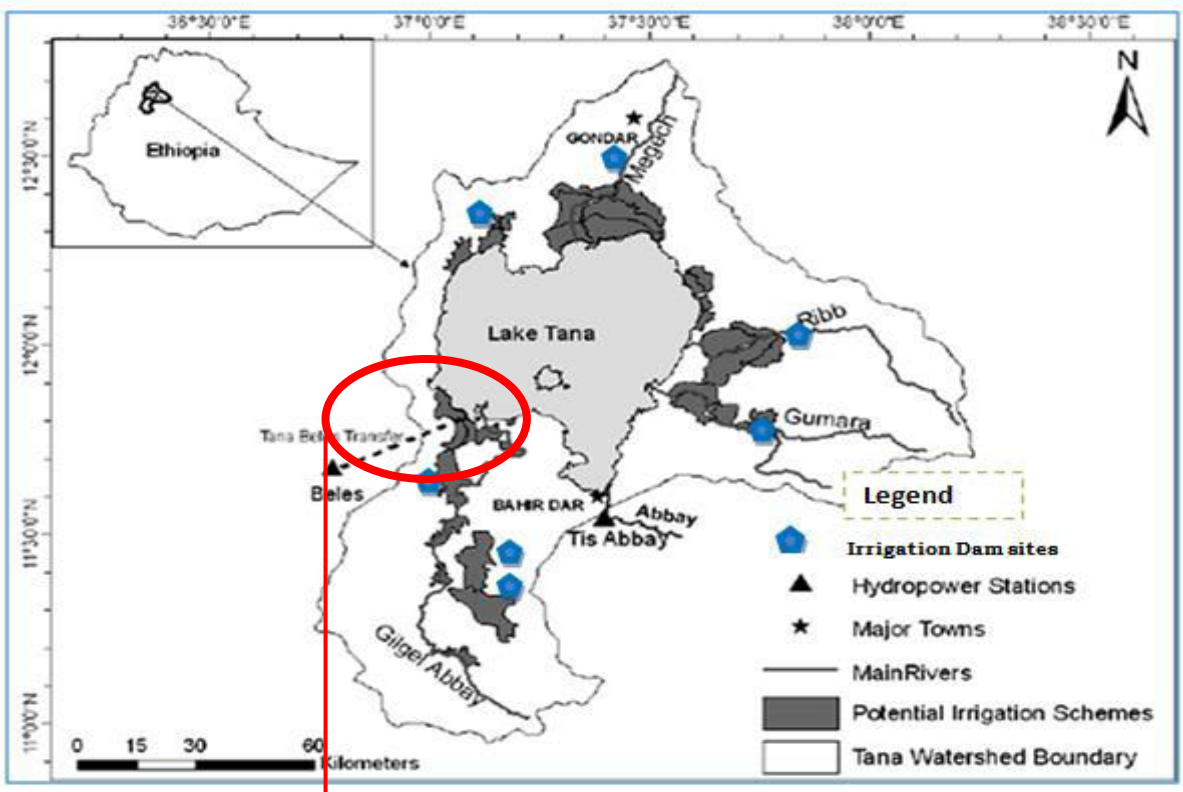


Figure 4.1: Lake *Tana* sub-basin, major rivers and planned development activities
Source: Awulachew et al. (2009)

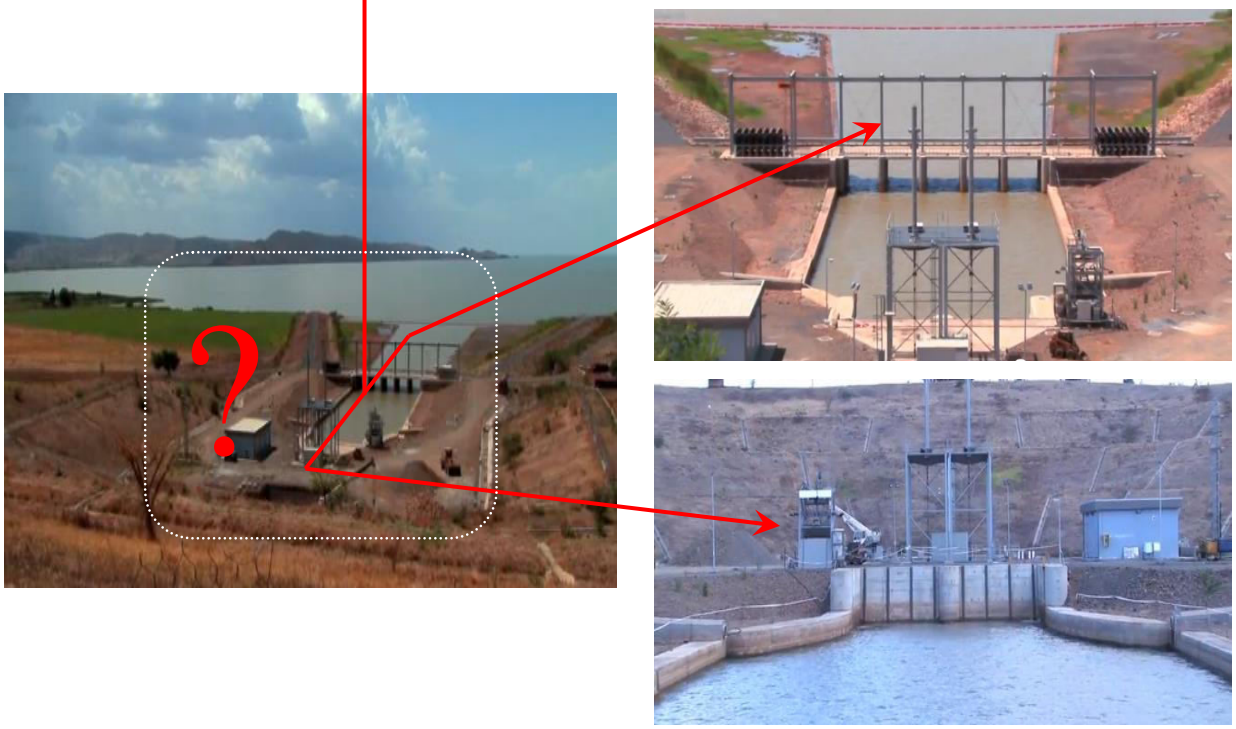


Figure 4.2: *Tana-Beles* hydropower and irrigation project inaugurated in 2010

Table 4.1: Planned and implemented irrigation development in Lake *Tana* sub-basin

Irrigation Scheme	Irrigable Area (ha)	Estimated annual gross water demand (Mm^3)*	Estimated net water demand (Mm^3)*	Large dam storage (Mm^3)	Stage of development
Koga	6,000	62	52	78.5	Functional since 2010
Northwest Lake *Tana*	6,720	54	46	Withdrawal from the lake	Completed and inaugurated in 2010
Ribb	19,925	172-220	146-187	233.7	Under construction since 2008
Megech	7,300	63-98	54-83	181.9	Under construction since 2008
Gumara A	14,000	115	98	59.7	Feasibility studies completed
GilgelAbbay B	12,852	104-142	88-121	563	Feasibility studies ongoing
Jema	7,800	57	48	173	Feasibility studies ongoing
Northeast Lake *Tana*	5,745	50-62	43-53	Withdrawal form the lake	Pre-feasibility studies completed
Southwest Lake *Tana*	5,132	42	36	Withdrawal from the lake	Identification

Source: *BCEOM 1998; Mott MacDonald 2004; WWDSE and ICT 2008; WWDSE and TAHAL2008a, 2008b cited in McCartney et al. (2010).*

*Notes:** Demands estimated through crop water modeling and presented in feasibility study reports. Where a range of demands is presented this reflects alternative cropping patterns. Gross-net demand is water returned to the rivers.

4.3 Learning from other lake ecosystems as a development and policy guide

Global research evidence show that the majority of lake ecosystems across the globe are under severe pressure. According to the World Preservation Foundation (as cited in Smith, 2012) one third of the world's major rivers and lakes are drying up, and the groundwater wells for 3 billion people living around the Lakes are being affected. The loss of rivers, lakes and underground water reserves are impacting the livelihoods of millions of people. While climate change is playing a role, the building of hydropower and irrigation dams, over extraction and mismanagement of water and over-fishing are all playing a part in the disappearing of the world's lakes and rivers (Smith, 2012).

An international synthesis that investigates the state of the Earth's ecosystems (the Millennium Ecosystem Assessment) reveals that, over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life

on Earth. Global ecosystem conditions and trends show that 50-80 per cent of original mangroves have been lost in the coastal ecosystem (Burke *et al*. 2000), and fifty per cent of world's wetlands lost during the 20th century in freshwater ecosystem (Revenga *et al*. 2000).

Some 60 percent (15 out of 24) of the ecosystem services examined in the Millennium Ecosystem Assessment-including fisheries and fresh water- are being degraded or used in ways that cannot be sustained. These problems will substantially diminish the benefits that future generations obtain from these CPRs; unless human attitudes and actions change, the pressure and degradation of ecosystem services could grow significantly worse during the first half of this century and is a barrier to reducing global food shortages and achieving the Millennium Development Goals (MDGs) across nations (MA, 2005; 2006).

Experiences learned from the Global Environment Facility (GEF) project which studied 28 lakes in the world, also show that development intervention of resource values for lake ecosystems typically take place in phases. Even stakeholders may not recognize the progress in the lake ecosystem. In early stages of resource development at 'A' (see Figure 4.3), they may be limited only to construction of lakeshore facilities for fisheries, navigation and small scale water supplies. As the population increases, the need for water for domestic, hydropower, industrial and agricultural uses increases, generally leading to construction of large scale flow control facilities. Through time the number of stakeholders involved and their interests also increases.

The commercial interest, development of tourism and recreational facilities may then grow, perhaps sufficiently to exploit the lake's cultural and natural heritage assets. As the resource values peak at 'B', the resource development activities are inevitably associated with infrastructure development and landscape alterations in and around the lake basins which, together with wastewater discharges from cities and industries, gradually accelerate degradation of resources, water quality and ecological integrity, usually without being noticed when they began at 'C' (ILEC, 2007). As a result conflict over resources among stakeholders is inevitable.

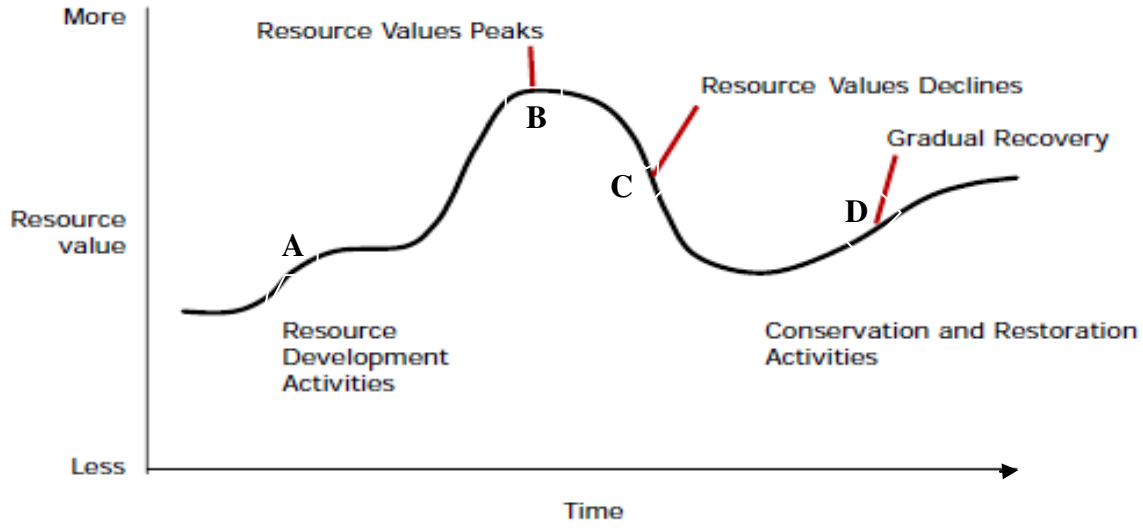


Figure 4.3: Changing resource values of a hypothetical lake
Source: (ILEC, 2007)

The progression of degradation inside a lake often takes place on a wider and deeper scale than is apparent. If the seriousness of a lake problem is realized in time by scientific means, resource conservation and restoration measures may produce some promising results. Often, however, the symptoms of degradation remain unnoticed for a long period of time because of their incremental nature, and the introduced conservation and remedial measures may be too little too late. The level of ecological and water quality degradation may have already reached crisis proportions, suddenly leading to instant loss of ecosystem sustainability (ILEC, 2007).

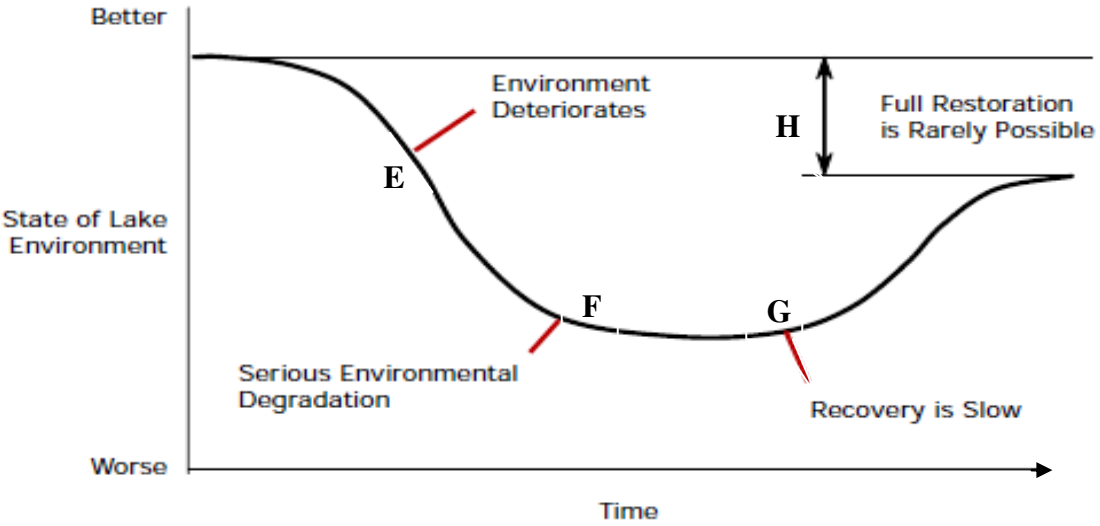


Figure 4.4: The resulting environmental state of a hypothetical lake
Source: (ILEC, 2007)

The same is true for Lake *Tana* ecosystem, where enormous development activities have been taking place since the 1990s. Without noticing what is going on inside and outside the Lake surroundings, there might be a serious degradation in the Lake ecosystem. There is research evidence that shows the overall progression of the Lake and its critical problems (Dargahi and Setegn, 2011; McCartney *et al.* 2010; Setegn, 2010; Vijverberg *et al.* 2009). However, minimal or no effort has been done so far at policy/higher governance level to reverse the situation. Unless protective measures are put in place, there might be a disastrous effect on the Lake ecosystem. As seen from Figure 4.4, once a lake ecosystem reached a serious environmental degradation (at F), recovery is slow (at G) and full restoration is rarely possible (at H).

Especially for poor nations like Ethiopia where economic, institutional and technological capacity to reclaim the environment is limited, it will be very difficult to preserve valuable environmental resources effectively. According to the Environmental Sustainability Index (ESI, 2005), which evaluates a country's potential to avoid major environmental deterioration, Ethiopia ranks 135th out of 146 countries with a score of 37.9 which is the least score among the 40 NEPAD (New Partnership for Africa's Development) member countries just above Sudan (with ESI score of 35.9). Even when compared with the 21 countries that are more than 50% desert, 15 countries scored from 39.8- 56.7. The ESI score quantifies the likelihood that a country will be able to preserve valuable environmental resources effectively over the period of several decades (Esty *et al*. 2005).

4.3.1 The Lake Haromaya Demise, Ethiopia

The then *Alemaya* now *Haromaya* lake in the Ethiopian Eastern highlands originally covered more than 1,751 km^2 but had shrunk to 879 km^2 (which is 50% of the original) in 1985 and to a mere 586 km^2 (33.5% of the original) in 2002. It is now believed that the lakes have all but completely dried up. The loss of the lakes, which were a source of drinking water, irrigation and fisheries, has affected the livelihoods and well-being of more than 550, 000 people in the Ethiopian towns of *Haromaya* and *Harar*. Preliminary research seems to suggest that serious siltation has been a major factor in the destruction of the lakes. A

dramatic increase in urban and rural settlements is also believed to have put tremendous pressure on natural resources in the area, including water resources (RCMRD, 2005). Increasing irrigation and domestic water use, change in the local climate, and changes in the surrounding land cover are believed to be the causes of *Haromaya*'s demise (Setegn *et al*. 2011).

4.3.2 Lake Chad, Africa

Lake Chad, once one of Africa's largest freshwater lakes, shared by Nigeria, Chad, Cameroon and Niger has shrunk dramatically in the last 40 years. In 1963, the lake covered about 25,000 km^2. Today it is one-twentieth of that size. The size of Lake Chad has gone from 30,000 km^2 to 3,000 km^2 in 40 years, according to some sources - from 25,000 km^2 to less than 1,500 km^2 in almost 30 years between 1966 and 1997(Coe M.T *et al*. 2001). According to Smith (2012) global warming, with steadily reducing rainfall, and water extraction have seen it diminish around 80% of the lake in the last 30 years. Major irrigation projects built in the 1980s, which made use of the two main rivers, Chari and Longone, which supplement the lake, were believed to be the causes of the drastic change in the lake ecosystems. According to Noury (2009), increased irrigation demands are said to have significantly decreased the flow of water into the lake; some speculating that the irrigation demands, which increased a phenomenal four times between 1983 to 1994, have accounted for a 50% decrease in the lake's water level.

4.3.3 Aral Sea, Asia

The Aral Sea, formerly one of the four largest lakes in the world with an area of 68,000 km^2, has been steadily shrinking since the 1960s. In 1965, the Lake had lost over 75% of its volume. By 2007 it had declined to 10% of its original size. The major reason for the Aral Sea demise was the two major rivers (Amu Darya and Syr Darya) that fed it were diverted by a Soviet Union irrigation project (Philip *et al*. 2008; Smith, 2012). Fish stocks-previously a stable diet for those living around have diminished, drinking water is saline and disease is rife. The region's once prosperous fishing industry has been essentially destroyed, bringing

unemployment and economic hardship, totally closing an industry that had employed 60,000. The Aral Sea region is also heavily polluted, with consequent serious public health problems. The retreat of the sea has reportedly also caused local climate change, with summers becoming hotter and drier, and winters colder and longer (U.S. Geological Survey, 2007; Smith, 2012). The shrinking of the Aral Sea has been called 'one of the planet's worst environmental disasters' (Daily Telegraph, 2010).

What can be learnt from those lake ecosystems which have disappeared completely (Lake *Haromaya*) and/or are partially endangered and under reclamation program (Lake Chad), is that it is an alarm bell for other lake ecosystems across the globe and the Lake *Tana* ecosystem in particular. It is therefore essential that key stakeholders should be aware of the potential threats of the Lake ecosystem so that for any hydropower and irrigation development in and around Lake *Tana* appropriate lessons can be learned from the above cases.

4.4 Case study of the fish commons: Overview of the Lake Tana fishery

4.4.1 The economic importance of fish in Ethiopia

Following the secession of Eritrea in 1993, Ethiopia lost access to an estimated 1,011 km of Red Sea coastline. Since then Ethiopia is a landlocked country and its main fish resources are from lakes, rivers and reservoirs. Despite being considered as the 'water tower' of the Horn of Africa and endowed with huge water resource potential, the current status of the Ethiopian fishery sector contribution to GDP is considered as marginal. And yet, aquaculture is recognized as an alternative means of achieving food security in the rural areas, and is now considered an integral part of rural and agricultural development policies and strategies in Ethiopia. Even though there is no fishery policy framework, a range of national development documents identify fisheries as being a sector in need of support to enable it to increase production and contribute to the food security of the growing population.

Ethiopian fresh water bodies (of which Lake *Tana*'s share is about 50%, whereas Minale and Rao (2011) reported 36% of total inland water of Ethiopia) are known to contain over 180 species of fish and some 37-57 are reportedly endemic (Golubstov and Mina, 2003). As reported by African, Caribbean and Pacific Group of states (ACP) Fish II project, currently the bulk of the fish catch (74%) originates from 6 main lakes: Lake *Tana* (25%), *Awasa*, *Ziway* and *Langano* (19%), *Chamo* (18%) and *Abaya* (12% of the national total production) and a further 26% from other water bodies. On the other hand, Abebe and Geheb (2003) reported that over 60% of Ethiopia's fish supply originates from the Rift Valley Lakes with significant benefits to the local and national economy. Commercial fishery in the Rift valley started in the 1950s, whereas in Lake *Tana* it started very late in the 1980s. Despite catches on these lakes declining in recent years there is still widespread belief in the country that potential exists to raise the annual production to over 49,000 tons per year possibly through the development of new constructed reservoirs, under-exploited river fisheries and aquaculture.

4.4.2 The status of Lake *Tana* fish resource

Lake *Tana* contributes 20-31% of the total fish potential of the country and is used for commercial fishing (Wondie, 2010). Lake *Tana* fishery has employed more than 50,000 persons who are directly and indirectly dependent on the major activities of fishing, marketing, and processing, and reliant on self employment for their livelihood. It is also contributing in giving employment opportunities to women and other landless people such as ex-soldiers as well as the fishermen (Eshete, 2005).

Over recent years fish demand has grown significantly and the food habit of the population has also changed. As a result, fishermen are motivated to harvest more fish to fetch a good price. The introduction of new fishing technology in 1986 was expected to result in a rapid increase in utilization of the fish resource (Wudneh, 1998). As indicated by Nagelkerke (1997), being not well exploited at the time when commercial fishing started, there has been a temporary rise in the yield. But gradually as the fishing pressure increases, fish production is decreasing (see Figure 4.5). In the absence of binding rules, regulations and effective government oversight, the status of important endemic and commercial fish species are declining; uncontrolled access and increased fishermen are exerting tremendous pressure on the fish resources. Moreover, if fishing pressure continues to be intense at the time of spawning, the fish populations are expected to decrease rapidly.

Members of the *Tana Haik* No.1 fishery cooperative (selected as a case study in this research) also confirmed that in the last 10 years fish production and marketing increased for the first five consecutive years and gradually has been declining since (see Figure 4.5). As a result, they are struggling to secure and sustain their livelihood. Those who are not able to cope with the situation are planning to leave the sector and search for other livelihood options such as sand mining and casual labor in the town. Too much fishing pressure and uncontrolled fishing activities are believed to be causing overexploitation of fish stocks and threatening the livelihood of the local fishermen.

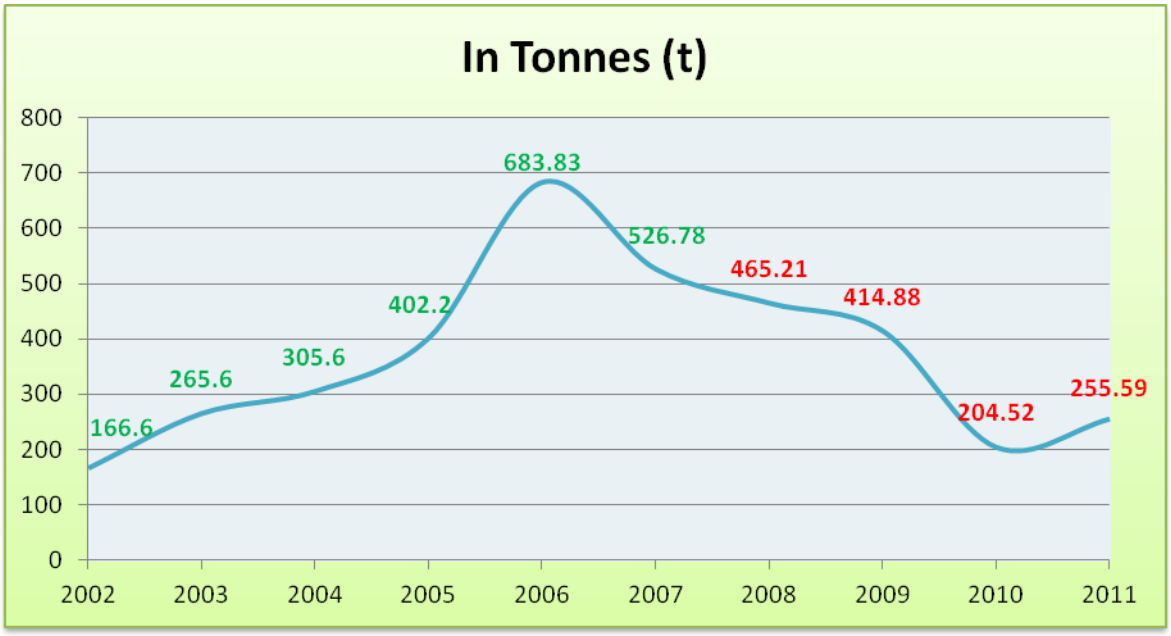


Figure 4.5: Trends of fish production and marketing (2002-2011)
Source: Calculated from Tana Haik No.1 fishing cooperative data sheet, 2012

After the introduction of more efficient gillnets compared with traditional fishing gear, unregulated fisheries have had a severe impact on the stocks of these rivers in spawning, lake-dwelling cyprinids. Gillnets were set near river mouths, effectively blocking them off from the lake, preventing mature individuals from reaching the upstream spawning areas (De graff *et al*. 2004). As reported by Vijverberg *et al*. (2009), the abundance of endemic *Labeobarbus* species in Lake *Tana* decreased dramatically by ca 75% over 10 years (1991–2001). With the advancement of the fish sector in the last two decades, it can be imagined what happened to the fishery resource in the following 10 years (from 2001-2011). The destructive fishing operations during the spawning season (August–September) in river mouths and upstream on the spawning grounds, alteration and destruction of spawning habitats has ultimately resulted in the loss of some fish species and extinction of 7 of the 15 endemic *labeobarbs* (*ibid*).

4.4.3 Historical trends of fishing around Lake *Tana*

Fishing in Lake *Tana* is believed to have been started around the 18th century by the *Negede woyto* and then the other poor members of the communities gradually adopted the activity. Though it is the largest freshwater body in Ethiopia, modernization of Lake *Tana*'s fishery did not occur until the end of the 1980s. Before 1986 Lake *Tana* fisheries was made up by a predominantly subsistence reed boat fishery, operated by the *Negede* people (De Graaf *et al*. 2006).

In 1986 motorized boats and modern, nylon gillnets were introduced as part of Lake *Tana* Fisheries Resources Development Program(LTFDP) which was initiated by the Ethiopian Ministry of Agriculture, the Ethiopian Orthodox Tewahido Church and two Dutch NGOs (ISE-Urk and ICCO-Zeist) (Reyntjes *et al*. 1998; Anteneh, 2005). This created new opportunities for the fishermen, extending their fishing area from the shore to deeper, offshore waters and, more importantly, to distant river mouths. Since then, the commercial gillnet fishery of Lake *Tana* developed rapidly and total annual catches increased from 39 tonnes in 1987 to 360 tonnes in 1997 (Wudneh, 1998). Despite the fact that they pioneered the Lake *Tana* fishery, the *Negede woyto* community has not participated in the process of modernizing the fishery sector in the study area.

Generally the historical trends of the Lake *Tana* fishery can be divided into three different but interrelated periods (see Table 4.2). The first period was before 1986 where the *Negede woyto* community members were the dominant fishermen. During this time technologies used for fishing were predominantly traditional and mostly they used reed boat, local fish traps and poisonous plants. As a result, the fishermen, limited in their mobility, only had access to the shore areas. Any dispute and complaints of local fishermen that might have happened were resolved informally.

The second period was between 1986 and 2003 where both modernized fishermen and the traditional fishermen co-existed. However, having modernized boats and nylon gill nets, the modernized fishermen were the most dominant and had access to both deeper offshore waters and distant river mouths. During this period there were no clear and specific formal rules and regulations to govern the behaviors of traditional and modern fishermen. The third period covers from 2003 up to present where the Fishery Development and Utilization Proclamation No. 315/2003 was enacted. The enactment of this proclamation was considered as a breakthrough for the fishery sector in general and Lake *Tana* fishery in particular. However, the preparation of regulations took a long time than expected which has affected the enforcement process.

Table 4.2: Major changes in Lake *Tana* fishery

Time period	**Predominant fishers**	**Types of technologies used**	**Fishing ground**	**Rules and regulations of fishing**
Before 1986	The *Negede woyto* community	-Reed boat -Local fish traps and hooks -Poisonous plants	-Limited to the Lake shore areas	Informal/self governed institutions
Between 1986-2003	-*Negede woyto* - organized/ modern fishers	-Modernized boats and nylon gill nets	-Lake shore areas -Deeper offshore waters -Distant river mouths	No formal rules and regulations
2003 to present	Organized fishermen	-Modernized boats and nylon gill nets -Illegal gill nets imported from Sudan	-Deeper offshore waters -Distant river mouths	- Proclamation and Regulation enacted -No directive since then -Not yet implemented

Source: Own survey result, 2011

Box1: Fishing organizations in Lake *Tana* Sub-basin

Fishers around Lake *Tana* are organized in cooperatives for credit and technical provision. With 78 members, *Tana Haik* No.1 Fishing Co-operative is the first that was established in 1987 around the Southern Gulf of Lake *Tana*. Currently, the *Tana Haik* No.1 cooperative consists of 114 (of which 13 of them are women) active members who are divided into 18 groups assigned to boats and 33 members who are waiting to be assigned to boats (in 4 districts adjacent to the lake, *Bahir Dar Zuria* (8), *Dera* (9), *Fogera* (8), *Libokemkem* (8)). The *Tana Haik* No.1 Fishing Co-operative has a net making facility mainly run by women. Women members of the cooperatives are engaged in net making and fish processing, whereas fishermen are involved in fishing and engine/boat maintenance. Some women members who have no husband or mature men in their family are obliged to hire someone who will be engaged in fishing. This cooperative rents out motorized boats to its members on a full cost recovery basis.

St. Georgis and '*Zege* Fish for All' associations are recently organized associations which are functional. Other associations are now emerging across 10 surrounding districts. According to the plan of the Regional Cooperative Agency, each district adjacent to Lake Tana will have a minimum of 1 association with 80-120 members. In general it is estimated that 1,300 fishers will be organized in association with modern fishing methods. The new cooperatives will get credit service to buy new engines, boats and gillnets (Eshete, 2003).

Source: Author, 2011

4.4.4 Institutions governing the Lake *Tana* fishery sector

According to key informants (members of *Tana Haik* No. 1 Fishery cooperative), the Lake *Tana* sub-basin fishery administration and governance is characterized by a lack of stakeholder participation and insufficient government commitment which leads to overexploitation and resource degradation. Before 2003, there were no specific formal rules that governed the behaviors of fish resource users. However, the introduction of more efficient gillnets compared with traditional fishing gear, unregulated fisheries and an increasing number of fisherman have had a severe impact on the fish resource in Lake *Tana* and its tributary river mouths. As the number of fishermen and motorized/reed boat increases, competition and conflict over the fish resource also increased which has ultimately led to decline of the fish stock (both in species and abundance).

The existing broad institutions governing the natural resource were not able to tackle fish resource degradation, depletion, minimize and/or prevent conflict among stakeholders, and secure sustainable livelihoods for the local fishermen and local community. Hence, crafting a new and/or modifying the existing institutions have become a paramount need for the fish sector in general. As a result, in 2003 the Fishery Development and Utilization Proclamation No. 315/2003 was enacted at Federal level to effectively use, manage and govern the fishery resources throughout the country. This is the only proclamation in Ethiopia that legally describes and elaborates capture fishery and aquaculture at the Federal and Regional level.

Following the Federal proclamation, the council of *Amhara* National Regional State enacted its own Fisheries Development, Prevention and Utilization Proclamation No. 92/2003. The objectives of these proclamation are almost similar: to conserve fish biodiversity and its environment as well as to prevent and control over-exploitation of the fisheries resource; to increase the supply of safe and good quality fish and to ensure a sustainable contribution of the fisheries towards food security; and to expand aquaculture development (Article 3).

The Regional proclamation covers the same area as the Federal proclamation, but has an additional objective relating to the creation of employment opportunities in fishing communities. It also states that information, including research findings, should be made available to the fishing communities. The Federal proclamation states that any fisherman who wishes to undertake commercial fishing from natural and man-made water bodies needs to have a legal fishing permit or license. It is also forbidden to transfer a fishing license to another person, to use illegal fishing materials such as explosive, ammunition, poisons, fish narcotizing plant or any devise that produces electric current and fishing from any water body by way of sifting the water (Article 5).

Concerning environmental protection, both proclamations state that the concerned organs of the Federal or Regional governments shall ensure that development programmes and projects are drawn up in such a way that they will not have direct or indirect negative impact on the fisheries resource constituted in the basin where the programmes or projects are intended to be implemented. According to the *Amhara* region Proclamation Article 8 (2), the concerned body shall firstly ensure that different factories and other similar institutions established in and around basins found in the region will not damage the basin, the fisheries resource and all things in the water. Powers and responsibilities to enforce the proclamation were given to the fishery inspector assigned by the Regional Bureau of Agriculture. The fishery inspector has the power to stop and search any fisherman found on any water body and inspect the fishing boat and/or gears, demand any fishermen reasonably suspected of contravening the proclamation and regulation etc.

After three years, the council of the *Amhara* National Regional government, in accordance with the powers vested in it under the provisions of Article 58, sub-article 7 of the revised Regional Constitution and Article 18 of the Fisheries' Resource Development, Protection and Utilization Proclamation No. 92/2003**,** enacted enforcement Regulation No. 50/2007. The purposes of the regulation was to determine the manpower, fishing equipment and productive methods which are necessary for the activities of the fish cultivation to be normally harvested without jeopardizing the overall potential resource and not exceeding the amount of annual produce dully prescribed beforehand, from any water body in the Regional state.

This regulation provides that the number and type of the fish harvesting gears to be appropriately used in the activity of producing fish from a certain water body shall not exceed the maximum number of harvesting instruments which should be employed to cultivate the fisheries resource without affecting the potential of same (Article 4/1). As a result, any fish cultivar shall register the type and number of fishing license granted to him, and wherever any variation of type or size occurs as to the registered fishing gears, the licensee shall notify same to the Bureau of Agriculture (Article 4/2). The Bureau may issue a specific guideline containing the type of instruments to be permitted for use in each water body along with the requirement to be complied with. Gill net, cast net and local trap and hook are fish harvesting gears permitted for use under this regulation (Article 4/3). Whereas, the regulation prohibits the following fish harvesting gears or for any other purpose in any water body (Article 5):

- Nets, whose size of meshes is narrow in width
- Pulling and/or trawl nets which may be hauled or pulled by manpower or boat for the purpose of fishing
- With the details to be determined by a directive issued by the Bureau (BoA), narcotic or polluting plants and chemicals
- Explosives, dynamites and other devices causing an electric shock.

The right to harvest fish resource for commercial purposes has been granted for those who acquired a fishing license to produce fish from a water body. Any fish harvesters, having acquired a lawful license, have the right to harvest fish either permanently or temporarily, in an individual, group or associational capacity (Article 6/1and 2). However, the regulation states that 'any person dwelling nearby a water body, is permitted (without license) to undertake fishing and have the right to capture up to 3 kg fish per day using a single hook for his personal or household consumption; provided that he/she may not avail the captured fish to market and sell' (Article 6/3). The regulation further vested power to BoA to determine the number of fish harvesters who may engage themselves in the activity of fish production in a certain water body, the type and number of the fish harvesting gears that a fish cultivator may possess taking into account the amount of the fish potential and fishery resource potential available in the water body (Article 6/5 and 6).

According to Article 7 of this regulation, to conserve the fishery resource available in any water body, fishing may not be undertaken in fishing breeding areas and seasons designated beforehand. On condition that such breeding areas and seasons are specified in the course of study the water bodies pertaining there to may partially or fully be closed. It is a prohibited act to cause the flow or drainage of industrial agricultural or maritime, urban and other sewage, possibly entailing harm to the fishery resource into any water body. Prior to any decision having been taken to utilize any water body for the purpose of irrigation development, generation of an electric power, water transportation, tourism and the like services, it shall be ascertained that no harm may be done to the product and quality as regards the potential of the fishery resource.

However, despite the existence of proclamations and regulations at Federal and Regional level, during the time of this study there was no limitation on the manpower, number or type of gill nets and fishing technology used, because directives to enforce the proclamation and regulations were not yet prepared and implemented at a regional level. There are no formal rules that govern the local fishermen. The fishery resource development, protection and utilization proclamation enforcement regulation No. 50/2007, Article 4/4 states that the sizes of meshes of gill nets that may be used in any water body shall, being varied and determined depending on the species of fish, and its developmental condition as well as the type of water body, be over 8cm in width. However, the district office of Agriculture and development agents reported that illegal fishing nets with less than 8cm are being introduced from Sudan and causing a rapid depletion of the fish resource around *Fogera*, *Libokemkem* and *Dembiya* districts. Until the time of this survey, there was no initiative from the concerned bodies to control the situation.

Generally, despite its potential contribution to the country's drive to food and livelihood security, Lake *Tana* fishery is threatened by a multitude of management and governance related problems. Proclamations and regulations for fisheries resource development, protection and utilization were enacted at national and regional level, but there were no binding legal rules that govern the behaviors of fishermen and other stakeholders at user level because directives to enforce rules and regulations at the operational level were not

prepared yet. Bureau of Agriculture and other key players in Lake *Tana* fishery sector have not been discharging their mandates and responsibilities as a result.

In summary the major problems of the fishery identified in the group discussion and key informant interviews are:

- Uncontrolled overfishing and loss of the endemic species
- Illegal fishing activities (mesh size less than 8mm is used)
- Importation of Illegal fishing gear from Sudan
- Lengthy law making process and weak rule enforcement to protect the declining stock of fishery resource
- Stakeholders' poor knowledge and perception of legislations, proclamations and their derivatives
- Mandated agencies not discharging their responsibilities (particularly BoA)
- Weak institutional framework to guarantee sustainable fish resource management and development
- Very limited stakeholder participation in the decision making process

4.5 Case study of the wetland commons and associated resources

According to the Ramsar Convention (1971) wetlands include a wide variety of habitats such as marshes, peat lands, floodplains, rivers and lakes, and coastal areas such as salt marshes, mangroves, and sea grass beds, but also coral reefs and other marine areas no deeper than six meters at low tide, as well as human-made wetlands such as waste-water treatment ponds and reservoirs (Ramsar Convention Secretariat, 2007). Wetlands are biologically important elements of landscapes and among the most threatened ecosystems on Earth (Laurance *et al*. 2012). Wetlands are of value because they play an important role in maintaining environmental quality, sustaining livelihoods of the poor and marginalized groups and supporting biodiversity. Wetlands are also eco-tones between lakes and terrestrial ecosystems which are vital for protection of the lake ecosystem against anthropogenic impacts (Wondie, 2010). Wetlands are commonly referred to as the 'kidneys' of the environment and are a crucial resource for rural livelihoods.

4.5.1 Ethiopian wetlands and the Ramsar Convention

As a result of different geological formations and climatic conditions, Ethiopia is endowed with vast water resources and wetland ecosystems including 12 river basins, 8 of which are River Basins, 1 Lake Basin and the remaining 3 Dry basins, with no or insignificant flow of the drainage system (MoWE, 2012). It is estimated that Ethiopian wetlands cover an area of 13,699 km^2 or 1.14% of the country's land surface (Abebe and Geheb, 2003). More than 80% of the country's wetlands are found in four regional states; *Amhara* (26.29%), *Oromiya* (24.23%), *Somali* (15.26%) and *Gambela* (15.08%) (WBISPP, 2002). However, wetlands are only addressed as components of other Federal water or environmental policies (Abebe and Gehb, 2003). Despite the recognition of wetlands as a key feature in watershed management in national water resources management policy, the practical implementation of conservation strategies for wetlands is almost none or very minimal. Consequently, many of wetlands in the country are at the edge of collapse due to continuous threats they are facing. Draining for growing food crops which involves double cropping, over harvesting of the resources, year round and over-grazing, the appearance of invasive plant species due to mismanagement of the resources, and the introduction of perennial crops (like eucalyptus)

into the wetland ecosystem are the major threats that are posing a danger to the country's wetlands (Hailu, 2005).

The Ramsar Convention on Wetlands is an intergovernmental treaty adopted on 2 February 1971, in the Iranian city of Ramsar, entered into force in 1975, whose mission is 'the conservation and wise use of all wetlands through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world'. It is the first of the modern global intergovernmental treaties on the conservation and sustainable use of natural resources. As of July 11, 2013, 168 nations have joined the Convention as Contracting Parties among which more than 45 African countries are members of the convention, and more than 2,131 wetlands around the world, covering over 205 million hectares, have been designated for inclusion in the Ramsar list of Wetlands of International Importance (Ramsar Convention Secretariat, 2013). Wetlands across the globe are identified as being of international importance if they meet at least one of the Criteria as adopted by the 4th, 6th, and 7th meetings of the Conference of the Contracting Parties to the Convention (COPs). Currently there are eight criteria (see Table 4.3) adopted by COP7 in 1999 as part of the Convention's Strategic Framework and guidelines for the future development of the list of Wetlands of International Importance.

Table 4.3: Criteria adopted by COPs for identification of wetlands across the globe

Criteria	Description A wetland should be considered internationally important;
1	If it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate bio-geographic region.
2	If it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.
3	If it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular bio-geographic region.
4	If it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.
5	If it regularly supports 20,000 or more water birds.
6	If it regularly supports 1% of the individuals in a population of one species or subspecies of water bird.
7	If it supports a significant proportion of indigenous fish subspecies, species or families, life-history stages, species interactions and/or populations that are representative of wetland benefits and/or values and thereby contributes to global biological diversity.
8	If it is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend.

Source: Ramsar Convention Secretariat, 2012

Most of the Ethiopian wetlands will qualify as potential Ramsar sites. Particularly Lake *Tana* ecosystem is the home of internationally important flora and fauna. The ecosystem fulfills almost all criteria possibly except criteria 5 adopted by COPs for identification of wetlands across the globe. However, despite it being a party to many of the international environmental treaties, Ethiopia has yet to ratify the Ramsar convention for wetlands. As reported by Barker (2004), one reason that has been given for this is a concern among government officials that designation of Ramsar sites will restrict the development activities that take place there, for example, converting natural wetlands into irrigated agricultural lands. However, during the period when this study was being conducted, a draft policy paper on wetland management was prepared and is waiting to be submitted for endorsement at the parliament level, and efforts are undergoing to make Ethiopia a signatory of the Ramsar Convention.

4.5.2 Lake *Tana* and its surrounding wetlands

Wetlands are located all around the lake, with the exception of the Northeast. The littoral zone of the lake is bordered by low plains in the North (*Dembia*), East (*Fogera* and *libokemkem*) and South-West (*Kunzila*) that are often flooded in the rainy season. Together they are the largest in the country and integral parts of the complex Lake *Tana*-ecosystem (Atnafu *et al*. 2011). During the raining period these wetlands are connected with the lake. They act as nurseries for most of the fish populations in the lake, and serve as breeding ground for water fowl and mammals (Vijverberg *et al*. 2009). Riverine wetland, semi-permanent wetlands (ponds), seasonally-flooded grassland are also found along the course of the major tributary rivers. Wetlands in the Lake sub-basin are crucial to the survival of the rural population as well as urban poor like the *Negede woyto* community who use them as a source of drinking water, craft and construction materials, medicinal plants, all season grazing land and fertile agricultural land for rice, maize, vegetables and cereals cultivation during the dry season.

Fogera Plain is well known for the 'ponds' which provide internationally important bird habitats. There are three main ponds, *Shesher*, *Welela* and *Daga-Takua*, all historically maintained by overbank flooding from the Ribb River. Following the river's change in

course to the north and increased human intervention such as dam construction at the upper stream, these ponds are now seasonal, drying out almost completely late in the dry season. Their drainage has been accelerated by excavation of small channels. Grazing and flood recession agriculture are practiced around the edges of the ponds, and they are subject to invasion by unpalatable weeds such as *Argemone mexicana*, resulting in reductions in plant diversity and the creation of single species communities dominated by *Sacciolepis africana* (Burnside and Tonkin and Taylor 2009). The *Shesher* wetlands are spread over at least 4 *kebeles* namely, *Nabega*, *Kidisthana*, *Shaga* and *Shina*, as a result conflict over the use of the wetlands transcends even beyond individuals to *kebeles*.



(a) (b)

Figure 4.6: Retreat farming around *Welala* pond (a) and invasive weeds (b)
Source: The Author (2011)

For the last two decades there has been a dramatic loss of the wetlands in the district. Since 1987, more than 90% of *Shesher*, 47 % of *Welela* and 73% of *Daga-Takua* wetlands were lost (see Table 4.4). The driving forces of massive destruction are; population pressure, unclear property rights and greedy self-interest of individuals.

Table 4.4: Percentage change in area of key wetlands in *Fogera* district

Wetlands of *Fogera* plain	**Area (ha)**			
	1987	**2008**	**Loss in 21 years (ha)**	****Percentage loss (%)**
Shesher	1,557	136	1,405	90
Welela	298	159	139	47
Daga-Takua	248	75*	181	73
Total	**2,103**	**370**	**1,733**	**82**

*Split into two parts, *Daga* and *Takua*
*Source: Burnside and Tonkin and Taylor (2009) ** Own calculation*

4.5.3 Major threats to the wetlands of the sub-basin

International reports suggested that since the 1900s, more than half of the world's wetlands have been lost through conversion to other forms of land use systems (Schuyt, 2005). According to Dugan (1990), 65% of wetland disturbances are of human origin, while the remainder has natural origins. Out of these, 73% of human origin disturbances are thought to result from direct human actions which can have lasting effects on wetland ecosystems, including drainage, dredging, filling, conversion to other land use, discharge of industrial wastes and municipal sewage, mining, dam construction etc. while the remaining 27% are believed to come from indirect sources like sediment diversion and hydrological alterations. Natural causes for instance drought, erosion, biotic effects can also affect the wetlands.

The survey result and focus group discussions with community elders also confirm that (see Table 4.5), the major threats of the shoreline and riparian wetlands include conversion to agriculture by draining the wetlands, industrial pollution, appearance of invasive species, introduction of perennial vegetation (like eucalyptus tree), overgrazing and overharvesting of wetland resources. Another quite different change in the past two decades that has dramatically affected the wetland ecosystem was the introduction and spread of a new rice cropping system in *Fogera, Dembiya* and *Libokemkem* districts and other Lake shore areas of the Lake.

According to local experts and community elders (key informants), despite its potential positive impact on the livelihood of the local farmers, rice cultivation has created a tremendous pressure on the wetland ecosystem. Farmers were encouraged by officials to cultivate waterlogged areas which were considered as either unused or waste land. Even though they considered wetlands as a valuable resource to keep the health of the Lake ecosystem, the temptation to free-ride is high among community members. This is because of the absence of specific rules and regulations that protect the wetlands from overexploitation and because there are no incentives to conserve the wetlands. On top of that, lack of clear awareness in general public, decision and policy makers coupled with the absence of clear policy and direction on wetlands issue are contributing to the problems mentioned before (Hailu, 2005).

Table 4.5: Threats to wetland resource as prioritized by resource users

Threat to the wetland resource	(n=200)	
	Frequency	Percent
Conversion to crop land and excessive grazing	121	60.5
Conversion to crop land	56	28.0
Other development activities	23	11.5

Source: Own survey result and focus group discussion, 2011

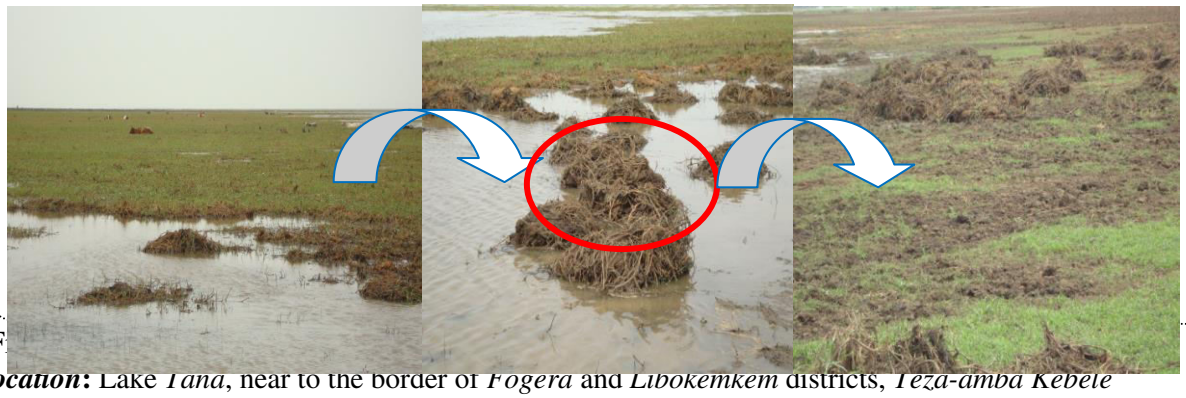
Wetland cultivation is derived by a multitude of stakeholder interests. The survey and focus group discussion also reveals that conversion to crop land, excessive grazing and government led development activities are the most threatening factors significantly affecting the wetland resource in Lake *Tana* sub-basin. Community members are competing to use the wetlands for crop production particularly for rice and maize cultivation, and for grazing. The majority (60.5 %) of respondents agreed that both conversion to crop land and excessive grazing significantly affect the wetland resource. Others (28%) argued that conversion to crop land has severe impact than excessive grazing because once converted into cropland the likelihood of recovering from degradation will not be easy, where as excessive grazing can be managed easily and recovery is not difficult (see Table 4.5).

As stated by the group discussants the driving forces are: population pressure, resource scarcity, seeking short term benefits, market access and Bureau of Agriculture's policies and programmes that encourage farmers to boost agricultural production by cultivating the unused lands (including wetlands). This creates an incentive for farmers to clear the wetlands for rice and other vegetable crops. Degradation of arable lands and depletion of soils encouraged the local community members to search for other alternative lands (wetlands). New technologies and irrigation facilities such as water pumps motivated the farmers to pump and cultivate the wetlands. In recent times, plantations of eucalyptus trees on wetlands are reported as one of the potential threats to the wetland ecosystem.

4.5.4 The downside of local proverb '*If Tana dry, plough up to dek'*

According to community elders retreat farming around Lake *Tana* had been started several years ago. Whereas a dramatic intensification of wetlands production started in the 1990s when the Bureau of Agriculture (BoA) promoted the 'Double or triple cropping per year' as a motto. Since then farmers were encouraged to seek other alternative lands (wetlands). In offseason (when the lake water level drops) farmers in the shore of Lake *Tana* practice retreat farming. For this purpose, farmers uproot the papyrus grass and other plant species and use them as a fuel wood so that it will not appear again for the next season (see Figure 4.7). During the rainy season, the water covers the area. Then, when the water level drops again, they will plough and cultivate the wetland. Most of the farmers who have cultivable land adjacent to the Lake shore wish to see the Lake level decrease without considering its impact on the lake ecosystem. Because they are always saying their motto 'If *Tana* dry, we will plough up to *dek*'-in Amharic; '*Tana biderk eske dek*' '*ጣና ቢደርቅ እስከ ደቅ*'.

All wetlands adjacent to Lake *Tana* are assumed to be a common-pool resource shared by the community members in their particular locality. However, community members believe that individuals owned the wetlands privately through illegal procedures but with legal land certification. This is due to corrupted *kebele* administrators and land administration experts at *kebele* and district level. On the other hand, for the purpose of farming, papyrus vegetation in most of the adjacent districts of Lake *Tana* has been destroyed by the local farmers. For instance, a report shows that in 2003 more than 10 hectares of papyrus vegetation were destroyed by deliberate fire outbreaks around *Zenzelma kebele* near to a village called *Debre Mariam*.



F

***Location*:** Lake *Tana*, near to the border of *Fogera* and *Libokemkem* districts, *Teza-amba Kebele*
Source: The Author (2011)

4.5.5 Lakeshore investment: The enclosure of the commons

Experience from different field settings and this study on the commons confirms a complex set of experiences, patterns and drivers of change and degradation that organize and re-organize across multiple levels of interactions among stakeholders. Outsider perceptions of local commons as wasteland, unused or inefficiently used resources, exacerbate processes of degradation. Extra local drivers of this kind often interact with local conditions in which indigenous or long-term residents already experiencing difficult livelihood conditions face access problems and declining resource availability (Armitage, 2007).

In the recent past, with the exception of regional government offices and residences, lakeshores around Lake *Tana* were considered as commons for the surrounding communities and public spaces that were open to other people elsewhere in the region. They used to fish, harvest papyrus grass, recreate, and celebrate rituals along the beaches and the shore of the Lake. Now, except some places which are still open to the public, the majority of the lakeshores are enclosed or privatized and access to those places is only allowed with a special entrance fee. Here typical examples are *Titu* recreation-entrance fee that charged 2 Birr/person, and *Kuriftu* Resort and Spa - there was a special membership entrance fee of approximately 200 Birr/person that will be charged upon first entrance. Except on Sunday morning for about 1 or 2 hours, it is not allowed to visit the Resort without this special entrance permit.

As has been argued by Bollier (2007) enclosure of the lakeshore means that people have to start paying for resources they previously got free, or cheaply. It means that people need to ask for permission to use something that was previously theirs by right. Therefore, enclosure shifts the ownership and control of a resource from a given community or the public at large, to private owners/investors. Once the cash value has been harvested from the commons, corporations/investors tend to dump their wastes and social disruptions (precisely known as 'market externalities') back into the commons, in this case Lake *Tana*, where upon they declare to government and the commoners: 'it's your problem'.

According to experts in BoEPLUA, lakeshore investment at the expense of wetlands around the Southern part of Lake *Tana* (see Figure 4.8) started since 1993, when *Bahir Dar* city became the seat of the *Amhara* National Regional Sate (ANRS). Since then, a tremendous level of investment particularly hotels, harbor facilities, and recreational sites steadily increased. Although the Environmental laws of the country require social and environmental impact assessment for large scale projects and investments, in practice such assessments are rarely conducted prior to investment. If an EIA is conducted, mostly it is to the satisfaction of the investors rather than to the environment or to the local community.

Article 3(1) of the EIA Proclamation *No. 299/2002* states,

> *Without authorization from the Authority or from the relevant regional environmental agency, no person shall commence implementation of any project that requires environmental impact assessment as determined in a directive issued pursuant to Article 5 of this Proclamation.*

In most cases, the regional Environmental Protection Authority (Bo-EPLUA) is not well informed about the investments that take place in the vicinity of Lake *Tana*. If informed, they have to approve as per the request of the investors.

Article 3(3)

> *Any licensing agency shall, prior to issuing an investment permit or a trade or an operating license for any project, ensure that the Authority or the relevant regional environmental agency has authorized its implementation'.*

Article 14 (2) further stipulated that,

> *The regional environmental agency in each region shall be responsible for the evaluation and authorization or any environmental impact study report and the monitoring of its implementation if the project is not subject to licensing, execution and supervision by a federal agency and if it is unlikely to produce trans-regional impact.*

Despite the existence of binding rules and regulations, however, the Investment Bureau, Bureau of Environmental Protection and Land Use Administration and other relevant stakeholders like city administration/municipality are not working synergistically. Sometimes, even they are in conflict where one promotes investment at the cost of the environment while others are striving for conservation and preservation of the lake ecosystem (Personal observation).



Figure 4.8: Wetlands converted into 'bare land' by private investors

***Location**: Near to Bahir Dar Fishery and Aquatic Life Research Center (BDFALRC).*
Source: The Author (2011)

As shown in Figure 4.8 daily laborers are filling the wetlands to change into 'bare land', so that the 'investor' will construct a building or use as a harbor for his/her boats. Surprisingly, experts from the Bo-EPLUA, who are expected to do Environmental Impact Assessment (EIA) and monitor the regional environmental condition, were not aware of what is going on there. Within a 1 Km radius, there is a protected wetland area designated by Bo-EPLUA.

4.5.6 Attitudes and perceptions of wetland users

Perception of wetland users about the value to be attached to the resource could affect the management and governance of wetland positively or negatively. It is their views of apparent benefits or costs arising from the resource system which will determine whether they will cooperate positively or act negatively towards governing the resource. Particularly conservation of natural resources is greatly affected by the perception and attitudes of the stakeholders who are involved in the process of resource use, management and governance. Therefore, in order to better understand their attitude towards the wetland commons, sampled wetland users were asked about their general perception of the wetlands in their localities.

Respondents had varying perceptions, knowledge and understanding of wetland resources. Particularly, perception and attitudes of wetland users towards the use value of wetlands is diverse and sometimes with a mixed feeling. Users' perception of wetland values have varied with time and other factors. They have ranged from an attitude where people viewed wetlands as wastelands to the present trend where some people view wetlands as opportunities for development. For instance, more than 90% (Agree +strongly agree) of the respondents are agreed that wetlands play a vital role in groundwater regulation and they are considered as the 'kidney of the environment' and heads of rivers and streams. And yet more than 70% (Agree +strongly agree) of the respondents still believe that 'wetlands are waste lands' so that they have to be put to better use (see Table 4.6).

Particularly in *Fogera*, *Dembia* and *Libokemekem* districts where the people had been severely affected by seasonal floods, to them the creation of a rice scheme and the controlling of floods was a relief. However the majority (66%) of wetland users were not agreed on considering wetlands as the only sources of malaria so that wetlands have to be put to better use, whereas more than 30 % of the wetland users in those flooded areas perceive wetlands as a source of malaria and seen as breeding grounds for mosquitoes and other pests, so that they proposed draining and cultivation of the wetlands as a solution. Despite their diverse perceptions of the wetlands, the majority of the respondents (94%) were agreed on the conservation and protection of the wetlands by Law.

However, group discussion results show that youths and landless farmers in each district considered wetlands as waste lands so that they wish wetlands should be distributed among themselves and cultivated for better use. From the household survey and focus group discussion results, it was understood that there were a variety of opinions about wetlands and resource users perceived wetland values differently. Mostly poor perceptions of wetland users lead to a massive destruction of wetlands in Lake *Tana* sub-basin.

Table 4.6: Resource users' perception of wetlands (n=200)

Items		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Wetlands should be used for cattle grazing	#	13	44	18	74	51
	%	6.5	22.0	9.0	**37.0**	**25.0**
I feel, wetlands were not very useful except for the provision of materials for thatching and making crafts	#	43	112	10	31	4
	%	**21.5**	**56.0**	5.0	15.5	2.0
Wetlands played a vital role in groundwater regulation, flood control and other related benefits	#	4	8	7	100	81
	%	2.0	4.0	3.5	**50.0**	**40.5**
All wetlands should be conserved and gazette so that they could be protected by law	#	2	5	4	87	102
	%	1.0	2.5	2.0	**43.5**	**51.0**
Wetlands are wastelands which could be put to better use	#	22	27	3	101	47
	%	11.0	13.5	1.5	**50.5**	**23.5**
Wetlands are the sources of malaria, so that it should be drained and used for other.	#	33	99	7	44	17
	%	16.5	**49.5**	3.5	22.0	8.5

Source: Own survey result, 2011

In summary, the major problems of wetlands are:

- Low public awareness on the values of wetlands
- Population and development pressure
- Low level of awareness, knowledge and skills of experts and lack of commitment
- Incompatible needs, often without a serious EIA and unsustainable investments near to the Lakeshore
- Lack of key stakeholders' accountability and responsibility
- Lack of clear and specific policy and legal framework on wetlands

4.6 Chapter summary

In summary, the Lake *Tana* ecosystem is endowed with multipurpose use values such as, fisheries, water supply, transportation, hydro-electric power supply, irrigation, heritage/religious practice, diversity of flora and fauna, tourism, quality of life for *Bahir Dar* residents, sources of food, income and livelihood for the local community and marginalized ethnic group (*Negede woyto*), waste processing (as a basket for *Bahir Dar* town), mining (sand), wetland products etc. These resources provide an array of social, cultural, religious and economic benefits for a wide variety of resource users and other stakeholders in and around Lake *Tana* sub-basin (see Table 4.7). Lake *Tana* ecosystem is also considered as an international commons where downstream stakeholders are claiming their stake, since the Lake ecosystem is the source of the Blue Nile which contributes more than 85% of the water that enters into the Nile River.

As can be seen from Table 4.7, the same stakeholder groups were identified for a number of resource functions and uses. This helps to see the interconnected groups and stakeholders that have an important stake in and power over the resource under consideration. However, as the number of resource users and demand for resources increases, accommodating the interests of multiple users at different levels becomes challenging for the Lake *Tana* sub-basin resource management and governance system. As examined by Swallow *et al.* (1997) accommodating multiple uses and multiple users of resources in complex resource systems (like Lake *Tana* ecosystem) has been identified as one of the priority themes for natural resources management and governance, policy formulation and intervention.

Table 4.7: Comparative analysis of different CPR systems in Lake *Tana* sub-basin

The resource systems →	**Fish and other aquatic life**	**Wetlands and associated resources**	**Lake *Tan***
Resource units	• Fish • Other aquatic life	• Wetlands • Reef/reeds /Papyrus, medicinal plants • Bird species	• Wate • Sand
Resource functions	• Source of food, income and livelihood • Eco-hydrological balance • Educational and research value • Biodiversity • Aesthetic and recreational value • Source of potential indigenous knowledge (The '*Negede woyto*' community)	• Source of food and feed, income and livelihood, fuel, construction • Biodiversity, agriculture, carbon sequestration • Water quality control, sediment retention, flood control • Ecological, hydrological and hydraulic • Aesthetic, recreational value, cultural and medicinal value • Educational and research value	• Hydr supp • Sour • Hom • Biod balar • Polit aesth • Wast sink, • Educ
Modes of CPR governance regimes	• Hierarchical but decentralized to the lowest level • BoA is the main governmental agency to look after the fish resource and fishery sector in general	• Usually, hierarchical but decentralized to the lowest level, in some cases community members may take parts to administer their wetland commons • *Kebele* and district administrators, EPLUA experts are responsible to administer	• Hiera • Thou powe their the F
Key management and governance concern	• Uncontrolled and overfishing • Loss of endemic species • Poor knowledge of legislations, proclamations and their derivatives • Mandated agencies not discharging their responsibilities (BoA) • Introduction of illegal fishing technology.	• Severe degradation • Loss of species • Unclear property rights and unplanned land use • Population pressure and land scarcity • Low level of awareness and stakeholders' wrong perception about wetlands	• Exter • Esca • Seric • Wate syste • Thre of th
Existing/proposed Legal/policy/Institutional framework	• Fishery Development and Utilization Proclamation and Regulation (not yet implemented and ineffective) • No directive to implement the rules	• No specific policy for the wetlands • Environmental policy and other international treaties/conventions • The Ramsar Convention is not yet ratified	• Wate • Envi • Diffe
Main Stakeholders groups interacting	Local communities, Members of Fishery production and marketing cooperatives, BoA, BoEPLUA, FAO etc	Local communities, Youths, Farmers, BoA, BoEPLUA, EWNRA, IBCR etc	Farmers, BoEPLU Stakehold

Source: Own survey result, focus group discussions and stakeholder identification and analysis workshop, 2011

CHAPTER 5

5. HUMAN SUB-SYSTEM: RESOURCE USERS AND OTHER STAKEHOLDERS

5.1 Introduction

The aim of this chapter is to present the second part of the research findings. This chapter focuses on the attributes of the human sub-system, including socio economic conditions and perceptions of their own situations, particularly the drivers of change that affect the CPR use, management and governance, the actors involved and their relative interactions in the CPR governance process. The attributes of the human-sub system ('attributes of resource users and other stakeholders') is one of the pillars of the conceptual framework of this research. Hence, this chapter will address the questions of what are the drivers of change that affect CPR use, management and governance, who are the key players in the overall CPR governance system and decision making process, what are the underlying causes of conflict among stakeholders, and what are possible resolution mechanisms.

Communities of users managing and governing common-pool resources (CPRs) such as forests or fisheries are excellent examples of complex systems. This complexity increases when social systems (the human sub-system discussed in this chapter) interact with natural systems (discussed in Chapter 4 of this research) that present similar analytical difficulties. Understanding these situations and identifying the actors involved is important given the increasing impact humans are having on the environment and the important role that communities and other stakeholders often play in natural resource management in diverse settings (Cox *et al*. 2010). The research technique applied here is a mixed method approach using both qualitative and quantitative data that makes it possible to better understand the interaction of actors in the action situation. The data analyzed and discussed in this chapter are therefore derived mainly from the household survey, stakeholder analysis and identification workshop and focus group discussions. Moreover, to substantiate data analyzed from primary sources, secondary sources were also used.

5.2 Characteristics of the community residing around the sub-basin

The socio economic conditions of residents in all sampled districts are characterized by low GDP per capita estimated to be 103.5 USD which is below the national average, 112.7 USD in 2003/2004 (BoFED, 2004). As reported by WME (2009), the illiteracy rate is very high with the urban population having better literacy rates than rural dwellers and males having

about twice the literacy rates of females. The household survey result also confirms that 50% of the sampled households are illiterate (among which 84.8% Female Heads are illiterate as compared to 42.2 % of Male headed respondents).

Almost 67 % of the sample households are dependent on crop and livestock production as a primary livelihood source. More than 20 % of the respondents are engaged in integrated crop, livestock and off farm activities as a form of livelihood (see Figure 5.1). The other livelihood options include crop integrated with fishing, wood collection and charcoal production. A typical household in the study area owns an average of 5 livestock (excluding poultry). Cultivable land is a critical problem in the study area. More than 70% and 58% of the respondents owned and cultivated less than 1 hectare of land respectively (see Table 5.1). Newly married couples have no access to cultivable land unless they are able to inherit land from their parents.

Households in the study area are predominantly male headed (77%) with fewer than 23% female headed. More than 76% of the respondents are married while 23% are either divorced or widowed. Out of these (23%), the majority of female head are either divorced (30.4%) or widowed (45.7%). The remaining 23.9% of the female head are married or re-married women who have their own land and lead their family (see Table 5.2). The minimum and maximum number of family members in the household is 1 and 12 respectively.

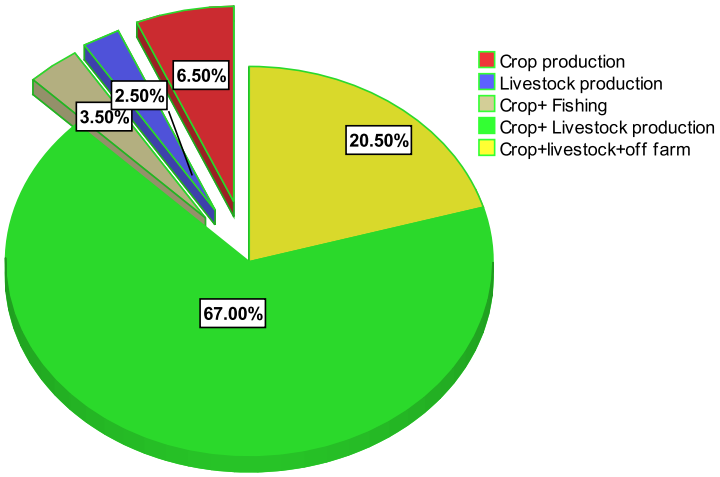


Figure 5.1: The primary livelihood source of the community (n=200)
Source: Own survey result, 2011

Table 5.1: Amount of land owned and cultivated by the household (n=200)

Holding in hectare	Owned		Cultivated	
	Frequency	Percentage	Frequency	Percentage
0- 1 ha	140	**70%**	115	**57.5%**
1- 1.75 ha	46	23%	66	**33%**
2- 2.75 ha	12	6%	15	7.5
3+ ha	2	1%	4	2%
Total	**200**	**100%**	**200**	**100%**

Source: Own survey result, 2011

The average household size is 5 persons per household slightly higher than the national and regional average, 4.7 and 4.3 persons per household respectively. The respondent's age ranges from 20 to 87 years. The community is composed of a more or less a homogenous ethnic group. The predominant ethnic group (more than 96% of the respondents) within each of the five districts chosen for the household survey is *Amhara*. Even though they are small in numbers the *Negede woyto* community are also found in *Bahir Dar* and alongside Lake *Tana* shore. The *Negede woyto* community is considered to be an indigenous people around *Bahir Dar*, and on the southern tip of Lake *Tana*. The community elders claim that their descendants were originally from Egypt. Members of this community are also residing in the North and South Gondar zones adjacent to Lake *Tana*. According to the 1994 national census of Ethiopia, the population of the *Negede woyto* was estimated at 1,677 but for unknown reasons they are not mentioned in the preliminary report of the 2007 population census. Currently, they predominantly live in *kebeles* 03, 11(*Abbay Mado*), 13 and 16 of *Bahir Dar* city and are not provided basic social services. However, along with the establishment and continued expansions of the town, they have been evacuated from their original settlements and pushed to various areas of the town.

Regarding their social status, they are considered as an inferior group in the society and the other groups look down on and exclude them. They claim themselves as Muslim but the Muslim community does not recognize and accept them as a member of the Muslim community proper. But they have their own mosque in one of the *kebeles*. In most cases,

their children are not attending formal schools but are engaged in simple informal activities like collecting garbage, firewood, street vending and shoe shining. Economically they are among the poorest section of the society. Traditionally, they were fisher and hunter men in and around Lake *Tana* (Care Ethiopia, 2011). They are endowed with traditional knowledge of hunting, fishing and construction of hand driven boats. Their livelihood is mainly depending on papyrus and fish. Mostly, they rely on papyrus reeds for much of their livelihood; using it to construct canoes for lake traders and other people who move around the lake by boat. They also use the reeds to make household utensils (such as baskets and mats) which they sell in local markets, both for utilitarian purposes and as tourist souvenirs (McCartney *et al*. 2010).

They are known for their hand driven boats made of a dried stalk of papyrus, and attractive grass type native to the shores of the lake. At present they have engaged in unproductive informal activities to generate income for their subsistence. This includes fishery, shaping stone grinding mills, thatching (*sifet*), and collecting fire wood, collecting and disposing home produced garbage. All the home based handicrafts are made using traditional skills and tools passed from generation but they do not enable them to be competent and have secure enough income for a better life (Care Ethiopia, 2011). Research reports suggested that the current status of papyrus and fish resources is under severe pressure which ultimately affects the livelihoods of the community.

Table 5.2: Distribution of respondents personal characteristics (n=200)

Description	District where the respondent live					All respondents
	Fogera	*Libokemkem*	*Denbiya*	*Achefer*	*Bahir Dar Zuria*	
No. of respondents	**82 (41.0%)**	**54 (27.0%)**	**16 (8.0%)**	**23 (11.5%)**	**25 (12.5%)**	**200 (100.0)%**
Sex						
Male	61 (30.5%)	35 (17.5%)	15 (7.5%)	20 (10.0%)	23 (10.0%)	**154 (77.0%)**
Female	21 (10.5%)	19 (9.5%)	1 (0.5%)	3 (1.5%)	2 (1.0)	**46 (23.0%)**
Level of Education						
Illiterate, no schooling	42 (51.2%)	30 (55.6%)	8 (50.0%)	14 (60.9%)	10 (40.0%)	**104 (52.0%)**
Adult Education	31 (37.8%)	13 (24.1%)	5(31.3%)	0 (0.0%)	8 (32.0%)	57 (28.5%)
Grade 1-4	5 (6.1%)	5 (9.3%)	2 (12.5%)	6 (26.1%)	4 (16.0%)	22 (11.0%)
Grade 5-8	3 (3.7%)	5 (9.3%)	1 (6.3%)	1 (4.3%)	2 (8.0%)	12 (6.0%)
Grade 9-10	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (4.3%)	0 (0.0%)	1 (0.5%)
Other(Religious)	1 (1.2%)	1 (1.9%)	0 (0.0%)	1 (4.3%)	1 (4.0%)	4 (2.0%)
Ethnicity						
Amhara	80 (97.6%)	51(94.4%)	15 (93.8%)	22 (95.7%)	23 (92.0%)	191 (95.5%)
Agew	1 (1.2%)	0 (0.0%)	0 (0.0%)	0 (0.5%)	1 (4.0%)	2(1.0%)
Others	1(1.2%)	3 (5.6%)	1 (6.3%)	1 (4.3%)	1 (4.0%)	7 (3.5%)
Marital Status						
Single	1 (0.5%)	0 (0.0%)	0 (0.0%)	1 (0.5%)	1 (0.5%)	2 (1.0%)
Married	62 (31.0%)	41 (20.5%)	15 (7.5%)	17 (8.5%)	14 (7.0%)	152 (76.0%)
Divorced	8 (4.0%)	4 (2.0%)	0 (0.0%)	5 (2.5%)	4 (2.0%)	21 (10.5%)
Widowed	11 (5.5%)	9 (4.5)	1 (0.5%)	2 (1.0%)	1 (0.5%)	25 (12.5%)
Occupation						
Farming	56 (28.0%)	37 (18.5%)	11 (5.5%)	14 (7.0%)	19 (9.5%)	**137 (68.5%)**
Farming and off-farm	11 (5.5%)	8 (4.0%)	4 (2.0%)	8 (4.0%)	3 (1.5%)	34 (17.0%)
Farming and Fishing	8 (4.0%)	6 (3.0%)	1 (0.5%)	1(0.5%)	1 (0.5%)	**17 (8.5%)**
Farming and Non-farm	7 (3.5%)	3 (1.5%)	0 (0.0%)	0 (0.0%)	2 (1.0%)	12 (6.0%)

Source: Own survey result, 2011

5.3 Common vision, understanding and perception of resource users

Driving forces are the underlying causes that influence and direct human activities. These forces, either directly or indirectly, result in changes in ecosystems, changes that can degrade ecosystem capability to provide goods and services. The roots of these forces can be economic, political, socio-cultural, and/or legal, and rarely occur in isolation, but rather act in conjunction with others (Zurlini, 2008). In order to understand the perception of resource users towards the drivers of changes, respondents were asked to identify and prioritize the most important drivers of change that affects the resource systems and the livelihoods of the local community.

Before the actual implementation of the household survey a list of drivers of change were identified and prioritized in different group discussion sessions across each district. Then the most important drivers of change that affect the management and governance of CPRs in the sub-basin were incorporated in the final interview schedule to grasp the perception and attitudes of resource users.

The household survey and focus group discussion results suggest that population pressure, unclear property rights, uncontrolled resource use pattern, new technologies, development pressure and new market opportunities for some commodities (i.e fish) are considered as the major driving forces that affect the trends of changes that are already occurring in Lake *Tana* sub-basin. More than 50% and 28% of the respondents agreed that population pressure and uncontrolled resource use pattern respectively are major drivers of change followed by unclear property rights (15%) that triggers the dynamics of CPR use, management and governance in the Lake sub-basin (see Table 5.3). Particularly unprecedented population growth in rural areas of the lake basin adds to the growing number of rural residents who are land short and landless. Every new family demands land for cultivation. However, unless they do inherit from their parents, it is not easy to access land.

Table 5.3: Drivers of changes in availability and access to CPR as prioritized by users

Drivers of changes	Focus group Discussion Ranking		Household survey (n=184)	
	Wetland users	Fishermen	Frequency	%
Population pressure	**1st**	**2nd**	91	**45.5**
Unclear property rights	**2nd**	5th	30	15.0
Uncontrolled resource use pattern	3rd	**1st**	55	**27.5**
New technologies and development pressure	4th	3rd	3	1.5
New market opportunities	5th	4th	5	2.5

Source: Own survey and focus group discussion result, 2011

District experts and community elders witnessed that, in recent times (since the 1990s) the majority of people in the Lake *Tana* sub-basin have been diversifying income generation activities as a means of reducing risks of livelihood insecurity. Shortage of arable land triggered the landless and youths to search for other livelihood options and they seek to adapt by taking on other supplementary livelihood options. Fishing, charcoal production, and serving as casual laborer both in rural and urban areas are the main supplementary forms of income generation. As a result with the advent of dramatic population growth, all land based resources and other life supporting resources scarcity have become a critical problem for the rural land tillers. Therefore, competition for these resources increases within the local community particularly between the well-off group and those who are poor and voiceless.

According to key informants and household survey respondents, the property rights assigned to CPRs are not clear and often they are ambiguous (for more details see section 6.4 Table 6.2). They further argued that though communal/common land issues are clearly defined in the revised ANRS rural land administration and use proclamation, as the property of the community residing near to the common pools, issues such as who is eligible to use the resources and how the appropriation of these resources can be carried out are not clear. As a result, more often CPRs are subjected to overutilization and degradation leaving the majority of the poor vulnerable to seasonal crises and livelihood insecurity.

Without a clear property rights of users, the CPRs are changed from common property regimes where the group has the right to exclude non-members from the use of the resources to *de facto* open access that does not have any kind of ownership. Therefore, every potential user is tempted to harvest more which ultimately leads to competition over resources, conflict and ultimately a major decrease in the availability and accessing of CPRs. The majority (76%) of the respondents confirms that, in the past two decades there was a major decline in the availability and accessing of common-pool resources, and 12% of the respondents agreed that there is a minor declining trend of CPR access and availability (see Table 5.4).

Table 5.4: Users' perception on the degree of change in availability and access to CPRs

Trends		**Frequency (n=200)**	**Percentage**
Decreasing	Major decrease	152	76%
	Minor decrease	24	12%
Increasing	Major increase	2	1%
	Minor increase	6	3%
	No change	16	8%
	Total	**200**	**100%**

Source: Own survey result, 2011

The household survey and focus group discussion results suggest that due to the impact of drivers of change such as population pressure, uncontrolled resource use pattern and new market opportunities, exclusion of marginalized groups (like *Negede woyto,* women and youths) and the rural poor from the CPR system has been increasing in the past two decades. The more powerful segment[12] of the society particularly politically affiliated and well-off groups are benefiting more from the CPR system. For instance, youths and landless farmers in *Fogera* and *Libokemkem* districts were engaged in sand mining as an alternative livelihood. However, they were excluded systematically by issuing license to the wealthy groups who are able to pay tax and administration fees.

[12] Powerful segment of the society- means those who are endowed with a relatively strong social capital and political affiliation. Social capital of individuals is determined by their social status and the structure of relations between actors and among actors in his or her network, whereas politically affiliated individuals usually assume administration positions so that they can use power to persuade others.

The majority of the household survey respondents (85% and 88.5%) were also agreed that the exclusion from CPR use has been increasing as the volume of CPR units available to harvest has been decreasing from time to time leaving the majority of CPR dependent households vulnerable to seasonal shocks (see Table 5.5). This shows that the amounts of CPR units that can be harvested from the resource system are shrinking from time to time.

Table 5.5: Users' perception on exclusion from CPRs and volume of resource unit

Trends in the past 10 years	Exclusion from CPR		Volume of CPR unit available to harvest	
	Frequency (n=200)	%	Frequency (n=200)	%
Increasing	170	**85%**	8	4.0%
Decreasing	9	4.5%	177	**88.5%**
No change	7	3.5%	7	3.5%
Unnoticed	14	7.0%	8	4.0%
Total	**200**	**100%**	**200**	**100%**

Source: Own survey result, 2011

Despite the fish stock decline, in recent times, a new dry fish market opportunity to Sudan has opened up; coupled with a new fishing technology imported illegally from Sudan, this motivated fishermen to harvest more and fetch a good price and triggered other community members to be engaged in fishing. Every fisherman is tempted to overharvest and exploit the available fish species. They have no incentives to conserve the fishery because any fish they leave is just going to be picked by the next fisherman. As a result, endemic fish species are overexploited and decreased dramatically, livelihoods of fishermen are severely challenged, and fish production and marketing activities of fish cooperatives decreased drastically, and competition and conflict over fish resources increased. According to key informants from the fishery cooperatives since the availability of fish stock is decreasing alarmingly, fishing in general is no longer considered as a productive or profitable enterprise, and most fishermen feel strongly that the fishery is not productive any longer unless protective measures are put in place. As reported by members of fishery cooperatives, fish and other aquatic resources are declining from over time.

Generally, analysis of data both from the secondary and primary sources indicated that the lake ecosystem is under severe challenges to support life in the sub-basin. The changes observed around Lake *Tana* are very dynamic. Particularly the development activities that are planned and implemented are huge. Despite its tremendous positive contribution towards the country's drive to achieve economic growth and reach the middle income countries in 2015, the development pressure on Lake *Tana* Ecosystem is casting doubt on the sustainable use value of the Lake *Tana* and its associated resources.

Different opinions of key informants were elicited regarding the future of Lake *Tana* in the next few decades. Respondents were asked; '*with the current development pressure and environmental degradation in and around Lake Tana sub-basin, what will be the probable fate of Lake Tana in the next few decades?* Some examples of responses are presented here.

> *'It is well known that Lake Tana is under severe pressure both from the human induced and natural calamity. Since, Lake Tana is fed by at least four perennial tributary rivers; I have no pessimistic view towards the fate of Lake Tana. However, there should be a strong research evidence to estimate the probable future. My worry however is that the silt load that enters in to the lake from upstream sub-basin is probably one of the most threatening factors that may determine the fate of the Lake'.*
>
> **Associate professor, *Bahir Dar* University, February, 2012**

> *'Every summer, we are witnessing the silt load that steps into the Lake. Unless an integrated watershed development intervention is taking place at the upstream sub-basin and the silt load to the bottom layer of the lake decreased significantly, Lake Tana will desiccate over the course of two decades'.*
>
> **Farmer, *Libokemkem* district, Kab *Kebele*, June, 2011**

> *'If the major tributaries continue to feed the Lake, the fate of Lake Tana will sustain. However, if they are blocked at the upstream for irrigation purpose, Lake Tana will be dried in the next few decades'.* **Participant farmers in the group discussion, 2011**

'Lake Tana is not an infinite resource, therefore, if we do not use the Lake's resource wisely and sustainably, the fate will be disappearance'. **Expert, in EPLAU, 2011**

It is clear that there is a difference in the views of stakeholders towards the likely future of the lake ecosystem. Most people hope that the probable future of Lake *Tana* will depend on the perennial tributary rivers that fed the lake from different directions. They believe that, so far as these rivers continue to feed Lake *Tana* nothing will happen to the lake ecosystem. The other view is if all planned development projects are finalized and the water that flows to the lake decreased significantly and the silt load problem persists, the fate of Lake *Tana* will be disastrous.

5.4 Who has a 'stake' and 'power' over CPR use, management and governance?

5.4.1 Introduction

Although stakeholder-related considerations are receiving an increasing attention within development scenarios and in particular, policy making processes, the actual management of stakeholders' identification and phase-specific involvement has not been covered sufficiently (Gerald, 2008). Therefore, it is imperative to understand how different stakeholders interact to solve CPR problems and to reduce or eliminate externalities, who are the key players, what are their interests, power, agendas, characteristics, circumstances, the roles, existing pattern of interactions, involvement and responsibilities of stakeholders in the process of resource use, management, governance and policy making.

Theoretically the interactive perspective on governance proposes that societies are made up of large numbers of governance *stakeholders*, who are constrained or enabled in their actions by *structures. Stakeholders*, in this perspective, are any social unit possessing a stake/agency or power of action. These include individuals, associations, leaders, firms, departments and international bodies. *Structure* refers to the frameworks within which these stakeholders operate; these limit or widen their action potentials and which they therefore must take into account. These frameworks include culture, law, agreements, material and technical possibilities (Kooiman *et al*. 2008).

In analyzing an institutional arrangement in CPR management and governance, one must investigate who is involved, what their stakes and resources are, and how they are linked to one another and to outcomes. Specifically, the types of actions that stakeholders can take, the type of information available to them, how actions lead to outcomes, and how rewards and punishments are allocated in light of the outcomes achieved and the actions taken all require identification (Ostrom, Schroeder *et al*. 1993).

The understanding of stakeholders' involvement in decision making processes is important in bringing them into governance, using their competencies and capacities as necessary, and ensuring they are heard and have influence (Bavink *et al*. 2005). Moreover, natural resource management typically deals with conflicting interests of various stakeholders since they use the same resources for different purposes. It is therefore important to understand the different perspectives of the stakeholders involved (Reed *et al*. 2009).

The overall objective of this section is to provide a preliminary description of actors' interest in and influence over CPR use, management and governance, and interactions of actors/stakeholders in the process of resource use, management, governance and policy process. It depicts the stakeholders' landscape based on focus group discussions, key informant interviews and the stakeholder identification and analysis workshop which was carried out by a multidisciplinary team of experts from different stakeholder groups (governmental, research, academic and NGOs).

5.4.2 Identification of stakeholders and stakeholder groups

Before the actual stakeholder identification and analysis, the stakeholder concept was pre-presented and discussed with workshop participants to ensure that participants had an appropriate level of understanding of the term as deployed in this study and to make sure all individuals have common understanding of stakeholder concepts and related issues. Then 5 broad stakeholder groups (see Table 5.6) consisting of 23 specific stakeholders and sub-stakeholder groups (see Table 5.7) who have legitimate interest in and power over common-pool resources in the sub-basin were identified. However, this identification cannot

guarantee the exhaustive lists of stakeholders in Lake *Tana*'s jurisdiction, because, stakeholders change over time, new stakeholders can enter a resource management and governance system, while others may lose their role or interest. Accordingly, in the wake of resource scarcity, undetermined demand for resources, dynamic institutional and structural adjustments; the nature of stakeholder's mandate or interest, the bases of their stake, the stake value and the power level to take action can be also more dynamic.

Once stakeholders were identified, it was necessary to do further analysis to better understand their relevance and the perspective they offer, to understand their relationship to the issue(s) and each other, and to prioritize based on their relative usefulness for CPR use, management and governance. A list of criteria to analyze each identified stakeholder was selected by the participants. These are; modes of participation, rights and responsibilities, their interest (stake value) and influence (power level), engagement in the process of CPR use, management and governance, and their legitimacy to claim for engagement and influence decision making.

As can be seen from Table 5.6 the role played by stakeholder groups and the source of their power to influence the CPRs management and governance system is diverse among stakeholders and stakeholder groups. For instance governmental organizations (spanning from Federal to *Kebele* level) are usually responsible to oversight the natural resource use, management and governance, to enact legislations, developing policies and ensuring the enforcement and implementation of Federal and Regional laws. The relative power of these stakeholders to influence the natural resource management and governance system mostly esteems from the formal law.

Table 5.6: CPR use, management and governance stakeholder groups

Stakeholder groups	Mode of participation, rights and responsibilities	Relative power/influence determined by
Governmental organizations • Law makers and executives • Policy makers and planners • Line ministries and authorities	• Enacting legislations (proclamations, regulations and directives) • Planning and implementation of sectoral policies • Managing development plans	• Legal hierarchy (chain of command and resource flow) • Authority of leadership (formal and informal, political affiliations) • Control of strategic resources (like finance, or land) • Trusted by the central government
• Academic and research institutes • Regional Bureaus • Municipalities • Corporations • District offices and *kebele* level administrations	• Enforcement of Federal and Regional laws • Oversight of natural resource use, management and governance • Monitoring and evaluation • Administration of natural resources	
Local Communities • Local farmers • Local fishermen • Commercial fishermen • Youths and Women • *Negede woyto*	• Livelihood diversification and security • Economic development • Management of natural resources	• Socio-economic and political status of stakeholders (i.e. Well-off groups are more influential than the poor and voiceless) • Social capital and informal influences within their group
Private (investors and enterprises) • Transport enterprises • Market enterprises and Investors • Boat owners	• Profit maximization • Enclosure of commons	• Their financial capital • Political affiliations
Non-Governmental Organizations • EWNRA • EOTC	• Environmental protection and conservation • Public awareness creation and education • Capacity building (both for community members and experts) • Promote and encourage stakeholders participation and collaboration	• programme compatibility with the Government plan and agenda • Their financial capital • Knowledge and expertise
International Communities • FAO**,** GEF, RAMSAR, UNESCO	• Technical and financial support • Compliance with international agreement and responses • Promoting policy improvement at national and international level	• Their financial capital • Knowledge and expertise • Political capital (their recognition worldwide)

Source: The outcome of the stakeholder identification and analysis workshop, 2011

5.4.3 Stakeholders' participation in CPR management and governance

Bottom up and inclusive stakeholder approaches for CPR use, management and governance are likely to enhance the credibility of the decision making process at different levels. Higher levels of stakeholder involvement usually imply that participants will have the opportunity to communicate their views, agendas and judgments in detail (OECD, 2004) so that there will be a consensus and common vision on CPR use, management and the governance decision making process. In reality however, most decisions regarding resource use, management and governance in Ethiopia emanate from above in a top down manner. In most cases natural resource policy makers followed a centralized approach in policy planning and development process. Relevant stakeholders were merely informed about any new policies, strategies but never engaged in its development and implementations. More often such policies and strategies failed to address real problems at grass root level and were at times in conflict with stakeholders' interest.

The stakeholder identification and analysis (see Table 5.7) clearly shows that there is low level of stakeholder involvement in key aspects of the CPR use, management and governance processes. From 23 stakeholders identified in the analysis, only 8 of them were participating in all forms of involvement (information, consultation, decision making and as a co-partner) in one way or another. Moreover, only few (less than 4) government-affiliated key stakeholders are active in all forms of involvements, particularly in decision making which needs power to persuade others (see Table 5.7). This clearly shows that government affiliated stakeholders spanning from the Federal to *kebele* level are more dominant in any key decision regarding resource use, management and governance. Whereas the majority of stakeholders identified are not fully involved in CPR use, management and governance processes. Particularly the participation of local users (local community, fishers, youth's groups and women's groups) who are supposed to be active participants in any decision regarding their commons are not well engaged in the process.

According to workshop participants stakeholders' involvement is fundamental to effectively use, manage and govern CPRs in the region. They also assert that it is important to recognize the roles that can be played by potential stakeholders and appreciate the extent to which different perspectives are valued within the CPR use, management and governance process. However, in the absence of strong political will and inefficiency of executive organs of the government at different level (particularly at regional and district levels), the key challenge for the CPR governance system is how to integrate the different perspectives, and at which stage different types of stakeholders can play roles and the ways that each might be involved.

Table 5.7: Stakeholders' involvement in CPR use, management and governance

Stakeholders	Forms of involvement					
	Information	Consultation	Decision making	As a coordination partner[13]	As cooperation partner [14]	As co-production partner[15]
Bureau of Environmental Protection	XX	XX	XX	XX	XX	XX
Bureau of Agriculture	XX	XX	XX	XX	XX	XX
Bureau of Water and Energy	XX	XX	XX	XX	XX	XX
Administration (Local-Federal)	XX	X	XX	XX	XX	XX
Local community	X	-	-	-	X	X
Academic and Research Institute	X	X X	-	XX	XX	X
Institute of Biodiversity	XX	XX	-	XX	XX	XX
Fishers	X	-	-	-	-	-
Abbay Basin Authority	X	XX	X	XX	XX	XX
International Organization	XX	XX	-	XX	X	X
Ethiopian Orthodox. Tewahido Church	X	-	-	X	X	-
Civic Societies	X	XX	-	X	X	X
Ethio.Wild Life Conservation Authority	X	X	-	XX	X	X
Ethiopian Electric Power Corporation	X	X	X	X	X	X
Investment Bureau	XX	X	X	XX	X	X
Youth's group	X	-	-	-	-	-
Women's group	X	-	-	-	-	-
Fish Prod. and Market. Enterprise	X	-	-	-	-	
Bureau of Tourism and Culture	X	X	-	-	X	X
Lake *Tana* Transport Enterprise	X	-	-	-	-	-
Municipality	XX	XX	X	X	X	X
Boat owners	X	-	-	-	-	-
Private Investors	X	-	-	-	-	-

Source: *The outcome of the stakeholder identification and analysis workshop, 2011*

X- Passive, XX-Active, -, no or very minimal participation

[13] Symmetrical exchange of information about intentions and plans
[14] Continual exchange of information and use of complementary resources
[15] Continual exchange of information and pooling of resources to achieve an agreed objective

5.4.4 The power and interests of stakeholders

Policy analysts have long been aware of the importance of interest groups in the policy process, decision making procedures, and the need to characterize and categorize levels of interest and power which influence, and therefore impact on, particular policies (Brugha and Varvasvsky, 2000). *Power* to influence policies or institutions stems from, the control of decisions with positive or negative effects. Stakeholder power can be understood as the extent to which stakeholders are able to persuade or coerce others into making decisions, and following certain courses of action. Power may derive from the nature of a stakeholder's organization, the political power of the leaders of the organization or their position in relation to other stakeholders (for example, line ministries which control budgets and other departments). Other forms of power may be more informal (for example, personal connections to ruling politicians) (IIED, 2005).

According to Majchrzak (1984), the power of the stakeholders is explained by decision making, resources at hand, their ability to mobilize resources, and their accessibility to policy decision makers in relation to CPR use, management and governance. It is the ability of the stakeholders to possess enough resources to make the outcomes they desire happen. Stakeholders exercise power based on physical, financial, and symbolic or social capital resources. Physical resources such as physical sanctions, forces and violence are ascribed as coercive power. Financial resources including material means, money, goods or services constitute useful power. Symbolic or social capital resources are normative symbols such as prestige, esteem and social symbols of acceptance (Mitchell *et al*. 1997). In CPR situations, interest can take many forms such as legal or moral rights, legal title, or ownership. The source of stakeholders' interests may derive from a variety of reasons; livelihood dependence, cultural and historical association, economic interest, institutional mandate, social obligations, value commitment and political interest are among the most important.

Although all the powers and responsibilities to administer and govern all land based natural resources are vested to the Federal and Regional governments, the lions share goes to the Federal government and its line ministries and subsidiary administrative bodies at different level. And yet, other stakeholders that have an interest in and power over CPR management and governance were identified.

As indicated in Table 5.8, a high score on both variables (stake value and power level) will make specific stakeholders a clear candidate for becoming involved in the natural resource governance decision-making process. Such stakeholders are likely to be the first to be consulted or represented. Variance in score among stakeholder groups may determine their relative influence and their formal status within the governing system. A low score on one attribute may be compensated by a high score on others. Thus, stakeholders may have less stake value and/or legitimate concerns, yet still enjoy a powerful governing position. Such a situation might easily challenge the participatory process and question the design of the governing system (Jentoft, 2007).

The stake-value-power analysis reveals that stakeholders that have higher levels of stake and high power to secure their stake (e.g. the Bureau of Agriculture) are likely have an extreme impact on the management and governance of the CPR system. However, even when a stakeholder places a high value on their stake in a CPR management and governance system (whether positive or negative) but has a low power level to secure the stake in the resource the system may not serve their interests. (e.g. Youth's group, see Table 5.8). Conversely, a more influential stakeholder with perhaps only a moderate interest in a particular outcome may still have greater power to secure this outcome (e.g. Institute of Biodiversity Conservation and Research, see Table 5.8).

Table 5.8: Stakeholder analysis of CPR management and governance

No	Stakeholder	Nature of the stake	Stake value	Power level	Total	Impact on CPRs
1	Bureau of Agriculture (BoA)	Regulation/Administrative	5(+,-)	6	30	Higher
2	Bureau of Water and Energy(BoWE)	Regulation/Administrative	5(+,-)	5	25	Higher
3	Administration[16] (Local to Federal)	Regulation/Administrative	4(+,-)	6	24	Higher
4	Bureau of Env. Prot. Land Use and Administration (Bo-EPLUA)	Regulation/Administrative	5(+,-)	4	20	Higher
5	Local Community	Livelihood/Cultural value	5(+,-)	3	15	Medium
6	Fishers	Livelihood/Cultural value	5(+,-)	3	15	Medium
7	Academic and Research Institute	Knowledge generation and transfer	3(+)	5	15	Medium
8	Ethiopian Wild Life Dev. and Conservation Authority (EWDCA)	Regulation/Administrative	3(+)	5	15	Medium
9	Institute of Biodiversity Conservation and Research (IBCR)	Conservation and protection	3(+)	4	12	Medium
10	Abbay Basin Authority	Regulation/Administrative	3(+,-)	4	12	Medium
11	International Organization (FAO, UNESCO, RAMSAR etc)	Cultural Values and Conservation	3(+)	4	12	Medium
12	Investment Bureau	Regulation, Administrative	3(-)	4	12	Medium
13	Ethiopian Electric Power Corporation (EEPCo)	Public Service/profit maximization	4 (-,+)	3	12	Medium
14	Youth's group	Livelihood/Cultural value	5(+,-)	2	10	Medium
15	Ethiopian Orthodox Tewahido Church (EOTC)	Livelihood/Religious value	3(+)	3	9	Low
16	Fish Production and Marketing Enterprise (FPME)	Economic/Profit maximization	4(-,+)	2	8	Low
17	Private Investors	Economic/Profit maximization	4(-)	2	8	Low
18	Boat Owners	Livelihood/Profit maximization	4(+,-)	2	8	Low
19	Lake *Tana* Transport Enterprise	Economic/Profit maximization	2(+,-)	3	6	Low
20	Municipality	Administrative	3(-)	2	6	Low
21	Civil Societies and Local NGOs	Non-profit making	3(+)	2	6	Low
22	Women's group	Livelihood/Cultural value	5(+,-)	1	5	Low
23	Bureau of Tourism and Culture	Administrative/Cultural value	2(+,-)	2	4	Low

Source: The outcome of the stakeholder identification and analysis workshop, 2011

Note: Stake value ranges from 1 up to 5 and power level from 1 up to 6 were assigned for each stakeholder and the value of the stake to the stakeholder was multiplied by the power to take action, the result is an indication of the stakeholder's likely impact on the common-pool resource management and governance. The + and – sign indicates whether the stakeholder affects the CPR system positively, negatively or both.

Stake Value -Critical=5, Essential=4, Necessary=3, Desirable=2, Non-essential=1
Power level – Control-complete= 6, Very significant=5, Influence-significant=4, Moderate=3, Low=2, Appreciation-lowest=1

[16] Administration- includes Federal and State representatives (such as Amhara Regional State Council, President office, Zone, district, *kebele* administrations, police, judiciary) excluding sector organizations

Even though they possess high interest in and low power on CPR governance, local communities and fishers residing near to Lake *Tana*, who have the *de jure* and *de facto* rights or claims over using and managing the CPRs are the most important stakeholders in the resource system. Their interests in CPRs are mostly driven by economic incentives or livelihood security. Under the power vested on the 1995 Constitution of Federal Democratic Republic of Ethiopia (FDRE), Article 40(3) all 'Ethiopian people and the State have exclusive right to ownership of rural and urban land, as well as of all natural resources, presumably including CPRs'.

Therefore, their customary and ownership rights also help them to own and/or access these resources. According to key informants and group discussants however, they often have limited rights to use CPRs. Where they have gained ownership or secure access, they may be hampered by corrupted *kebele* and district administrators who are using CPRs for their self-interest, inadequate levels of public investment, inappropriate policies, or competition from greedy private investors unrestrained by rules and regulation. In some cases, government agencies and other powerful interests like private investors often claim exclusive access to these resources and their benefits.

Some stakeholders are interested because of administrative and social obligations to manage and govern the natural resource system. Power to take action and secure the outcomes could be vested politically or as a result of their social/financial capital. For example, the Bureau of Agriculture (BoA) has been vested a power by Federal government under Proclamation No. 110/2007 and by Council of *Amhara* National Regional State to conserve fish biodiversity and its environment, cultivate fisheries resource with appropriate fishing equipment as well as prevent and control over exploitation of the fisheries resource.

The *Amhara* National Regional State, Fisheries Resource Development, Protection and Utilization Proclamation enforcement, Regulation No, 50/2007 Article 3 sub article 4 states that:

> *'The Bureau may particularly or fully cause the activity of fish production be terminated, as deemed necessary, at any water body whenever it believes that the potential of the fishery's resource may be disturbed and thereby be extinct, the area is ascertained to be that of delivery and reproduction, especially during breeding seasons, or where there happens to be a dwindling of the species of fish thereof'.*

Generally at Federal level, the Ministry of Agriculture (MoA) has both development and natural resource management responsibilities (vested under Proclamation No. 380/2004). Relating to natural resources management, MoA has the responsibility to prepare policy on land use and draft legislation on forestry and wildlife. Bureau of Agriculture is the key natural resource management institution at regional level, responsible for the management of land, forest, wildlife and biodiversity resources (Proclamation No. 110/2007). However in reality BoA is mainly focusing on crop production and promoting cultivation of more lands including wetlands which are important components for the fish reproduction and the kidney for the health of water bodies like Lake *Tana*.

Conversely, international stakeholders such as FAO and UNESCO can affect CPR management and governance through their interests in issues like ecosystem and biodiversity conservation. Basically their power over CPRs is driven by their financial capital, international agreements and conventions that individual countries have ratified.

5.4.5 Classification of stakeholders

Following Eden and Ackermann, (1998); De Lopez, (2001) cited in Reed *et al*. (2009) based on their power and interests, stakeholders who have the stake on the CPRs in and around Lake *Tana* ecosystem were classified into '*Key players'*, '*Context setters'*, '*Subjects*' and '*Crowd*'. '*Key players'* are stakeholders who should be actively organized and engaged in key decisions, because they have high interest in and power over CPR management and governance. '*Context setters'* are highly influential (powerful), but have little interest. Because of this, they may be a significant risk, and should be monitored and managed. '*Subjects'* have high interest on resource use but low influence on management and governance decision making. By definition they are supportive; they lack the capacity to affect the resource governance system significantly, although they may become influential by forming alliances with other stakeholders. These are often the marginal stakeholders that development initiatives seek to empower. *The 'Crowds'* are stakeholders who have little interest in or influence over desired outcomes and there is little need to consider them in much detail or to engage with them in key decision making. However, precaution should be taken not to ignore their interests.

Stakeholders can enter into and out of the system at different points in time, therefore interest and influence typically change over time and the impact of such change can be considered. The purposes of this classification are: to reveal the interests and influence of the stakeholders, to understand synergies and conflicts between the stakeholders, their demand for Lake *Tana* ecosystem functions and services delivered by CPRs. However, interest and power are not static, and as stakeholders change position, tensions arise when key players have conflicting interests (Reed *et al*. 2009).

Stakeholders appearing in the *key player's* category (Figure 5.2) have a high degree of influence/power on the management and governance of CPR systems and environmental decision-making processes, which are also of high importance/interest for the success or failure of technological and institutional innovations induced and/or created by government agencies, user groups and community members. This implies that natural resource management program and policy implementing organizations will need to construct good

working relationships with these stakeholders, to ensure an effective coalition of support for the resource management and governance. These are the stakeholders the resource governance system must fully engage and make the greatest efforts to understand and address their concerns.

Stakeholders in the *subject's* category are of higher stake value/importance to the success of the management and governance of the CPR system and environmental decision-making processes, but with low influence/power to take action. This entails that they will require particular initiatives if their interests are to be restricted. Despite their low power, such stakeholders could be valuable allies in important decisions regarding CPRs. Therefore, it is advisable to keep them informed about the issues they are interested in. The governance system should keep these people adequately informed, and talk to them to ensure that no major issues arise (De Colle, 2005). An example may be traditionally marginalized groups (e.g. Indigenous people like the *Negede woyto* community, youth's group, and women's groups), who might be solely dependent upon the resource system for their livelihood and beneficiaries of a new service, but who have little 'voice' in its development.

Context setters are stakeholders with high influence/power, who can therefore affect the management and governance of CPR systems and environmental decision-making processes and outcomes, but whose interest/stake value is not necessarily aligned with the overall goals of the environmental decision-making processes. In a multiple use-multi-stakeholder scenarios of resource management and governance, the relationships with these stakeholders can be very complex to manage. Most of the time, they behave passively and show a low interest in key management and governance decisions. It is therefore necessary to analyse potential intentions and reactions of these groups in all major developments, and to involve them according to their interests (De Colle, 2005). They might be international organizations such as FAO, UNESCO, who can exercise considerable impact over funding disbursements and governmental organizations such as research and academic institutions who can exert valuable impact on the CPRs through their intellectual excellence. This conclusion implies that these stakeholders may be a source of significant risk in terms of financing environmental governance programmes and backing technical expertise, and they will need careful monitoring and management.

The stakeholders in the *Crowd*, with low power/influence on, or importance/stake value to the management and governance of the CPR system, may require limited monitoring or evaluation, but are of low priority. However it is advisable to monitor these stakeholder groups as they ability to influence and their interest could increase overtime (De Colle, 2005).

As Bryson (2004) pointed out power versus interest grids (see Figure 5.2) typically help determine which players' interests and power bases must be taken into account in order to address the problem or issue at hand (in this case CPR use, management and governance issues in and around Lake *Tana* sub-basin). Therefore the interest-influence grid clearly shows that governmental organizations such as the Bureau of Agriculture, the Bureau of Water resource, the Bureau of Environmental Protection Land Use and Administration, and Administrations at different levels are key players with high power to secure their stake and have a significant impact on CPR use, management and governance issues in the sub-basin.

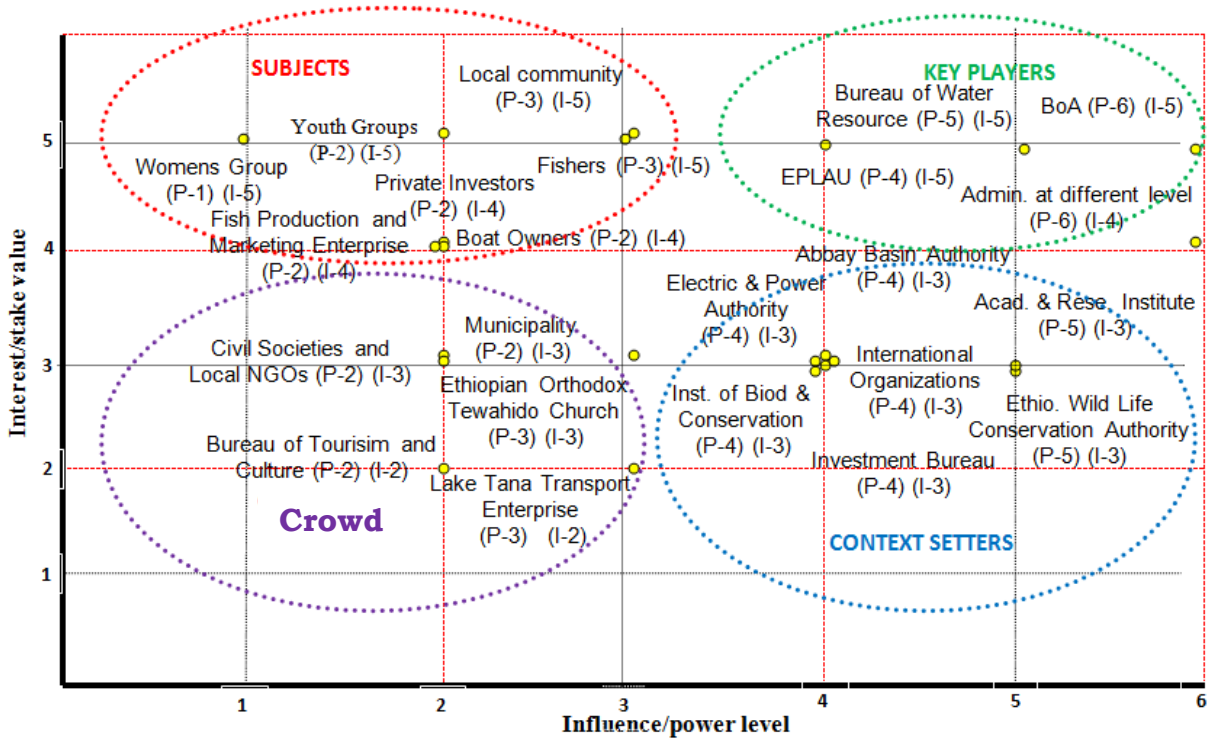


Figure 5.2: Interest-influence matrix of stakeholders

P- stands for power level,

I- stands for interest level

Source: Stakeholder identification and Analysis Workshop, 2011

5.4.6 The legitimacy of stakeholders

Legitimacy in this research refers to the perceived validity of the stakeholders' claim to a stake in CPR management and governance in the Lake *Tana* sub-basin. Based on the mandate and responsibilities given by the Law of the Land (The Ethiopian Constitution), international treaties and customary laws of specific communities in the jurisdiction of Lake *Tana* sub-basin, stakeholders' legitimacy with regard to CPR management and governance were assessed and evaluated against criteria. During the stakeholder identification and analysis workshop, parameters that denote the legitimacy of a stakeholder or stakeholder groups were derived. However, this assessment is subject to the qualification that under complex and very dynamic systems, stakeholders' legitimacy may changed at any point in time, so that the current assessment is only representing the existing scenario.

Though based on the subjective evaluation of stakeholder identification and analysis workshop participants, the analysis reveals that Bureau of Environmental Protection Land Use and Administration, Bureau of Agriculture, Bureau of Water and Energy, Administration (from Federal to local level) and the local community had a particularly strong and legitimate claim to use, manage and govern the CPRs in Lake *Tana* sub-basin, because they ranked high on all the criteria, and totaled the highest score (see Table 5.9). This analysis can be particularly useful in the CPR management and governance planning process, especially as a way to convince other stakeholders that the legitimacy of these stakeholders has to be respected and integrated into the management and governance system. At the same time, these stakeholders are responsible for and accountable to the overall success and/or failure of the management and governance system of the study area.

Table 5.9: Stakeholders' legitimacy to manage and govern CPRs

	Criteria								Score/Rank	
Stakeholders/stakeholder groups	The formal and informal property rights vested in the stakeholder(s);	The extent to which they have a historical or cultural relationship with the resource;	The knowledge and skills that they are able to contribute to the management process;	The level of commitment to the management process;	The compatibility of their resource use patterns with sustainability and conservation requirements;	The extent to which there is equity in access to, and in distribution of the benefits from, the use of the resource;	The compatibility between local practices and national development and conservation policies and priorities;	The present and potential impact of the activities of the stakeholder on the resource base	**Total Score (40)**	**Rank**
Bureau of Environmental Protection	4	3	5	5	5	3	4	4(+)	33	1st
Bureau of Agriculture	5	4	4	3	3	3	3	5(+,-)	30	2nd
Bureau of Water and Energy	4	3	4	4	3	3	3	5(+,-)	29	3rd
Administration (Local-Federal)	5	3	3	2	4	3	4	4(+,-)	28	4th
Local community	5	5	4	3	2	2	2	5(+,-)	28	4th
Academic and Research Institute	2	3	4	4	4	2	4	4(+)	27	6th
Institute of Biodiversity	3	3	4	3	4	4	3	3(+)	27	6th
Fishers	5	5	3	2	1	2	3	5(+,-)	26	8th
Abbay Basin Authority	5	3	4	3	2	2	2	4(+,-)	25	9th
International Organization	2	1	5	4	4	3	3	3(+)	25	9th
Ethiopian Orthodox. Tewahido Church	2	4	3	3	3	3	3	3(+)	24	11th
Civic Societies	1	1	4	3	4	3	4	3(+)	23	12th
Ethio.Wild Life Conservation Authority	2	1	4	4	3	2	3	3(+)	22	13th
Ethiopian Electric Power Corporation	3	3	2	2	2	3	3	4(-,+)	21	14th
Investment Bureau	3	3	4	2	1	1	2	5(-)	21	14th
Youth's group	4	3	2	2	2	1	2	4(+,-)	20	16th
Women's group	4	3	2	2	2	1	2	3(+,-)	19	17th
Fish Prod. and Market. Enterprise	3	3	2	1	2	2	2	3(+,-)	18	18th
Bureau of Tourism and Culture	3	2	2	1	3	1	3	2(+)	17	19th
Lake *Tana* Transport Enterprise	2	2	2	2	1	1	2	4(+,-)	16	20th
Municipality	2	2	2	1	1	2	2	3(-)	15	21st
Boat owners	1	2	1	2	2	1	2	3(+,-)	14	22nd
Private Investors	1	1	1	2	1	1	1	5(-)	13	23rd

Source: The outcome of the stakeholder identification and analysis workshop, 2011

Note: Their right and responsibilities are evaluated as; 5=very high 4=high 3=Medium 2=Low 1=Very low

5.5 Chapter summary

In summary, the outcome of the research questions reveals that communities residing around Lake *Tana* sub-basin derive their livelihood from agriculture particularly crop production. The majority is engaged in farming to secure their livelihood and is heavily dependent directly or indirectly on CPRs. However, CPRs are under severe threat in the study area. Access and availability of basic CPRs has been declining leaving the wider community vulnerable to resource scarcity and seasonal shocks. Development activities around Lake *Tana*, population pressure, agricultural intensification (crop land expansion at the expense of grazing/wetland), livelihood diversification, unclear property rights and ineffective often irresponsible resource governance system at the user level are considered as the major factors that affect the CPR management and governance.

When the multi-purpose values of the whole Lake *Tana* sub-basin are considered, there are multiple stakeholders with diverse interest in and power over CPR use, management and governance. There are conflicts arising from different stakeholders exploiting the lake basin's resources for various goals. Multiple use value of resources by different stakeholders often with divergent interest in and power over these resources has resulted in multi-dimensional conflicting scenarios. In case of conflict over resources, the drivers of change (such as population pressure, uncontrolled resource use pattern and unclear property rights), lengthy and costly legal procedures coupled with weak executive powers of the judiciary further aggravate the CPR situation in Lake *Tana* sub-basin.

Generally, the interaction of stakeholders in the process of resource use, management and governance is characterized by low or insufficient stakeholder participation in key decisions regarding CPRs. There are insufficient policy forums that facilitate collaboration, linkage and policy dialogue among relevant stakeholders at different levels. In most cases lack of joint policy planning and implementation lead to conflict of interest among stakeholders.

CHAPTER SIX

6. THE GOVERNING SYSTEM: 'INSTITUTIONS' AND THE GOVERNORS

6.1 Introduction

This chapter describes the overall natural resource governance system of Ethiopia at different levels of hierarchy, namely the constitutional, collective and operational level. Governance is widely used to cover institutions, instruments and processes ranging from short term operational management to long term policy development and planning and from conventional forms of administration to modern forms of participative decision-making processes (FAO, 2005-2012). The governance system on the other hand refers to the totality of institutional arrangements, policy frameworks, stakeholders involved and the process of governance which deals with the diversity, complexity, dynamics and the varying scales of actions.

The common-pool resource governance system in this research context refers to the range of political, social, economic and administrative systems that are in place to control and regulate CPR use, development and management at different scales (Federal, Regional and Local/user level). Therefore, understanding the governing system which comprises the governors and the rules in use is a key component of the identification and analysis of CPR governance problems and gaps discussed in the subsequent chapters which ultimately help to devise effective policy interventions.

This chapter will answer the question of what are the existing institutional arrangements governing natural resources in general and CPRs in particular. It addresses the 'Institutions/Rules-in-use and Rules in form' of the conceptual framework indicated in section 2.6 Figure 2.1. The data analysis and interpretations discussed in this chapter are derived mainly from secondary sources particularly documentary analysis of policy documents, national and international legislations. The documentary analysis is also supplemented by focus group discussions, household survey and stakeholder identification

and analysis. The chapter has three substantive sections, the first of which begins by describing instruments of the governance system. The objective of this section is to depict the overall natural resource management and governance framework in Ethiopia. The second section presents key governing actors involved at different levels who have legitimate stake and power over the management and governance of natural resources. The third section highlights the modes of CPR management and governance and property rights issues in Lake *Tana* sub-basin.

6.2 Instruments of the governance system: Institutions-in-use to govern CPRs

Instruments link the governance system to the action where rules and regulations are applied. The range of instruments available to influence societal interactions is extremely wide (Kooiman *et al*. 2008). It ranges from peer pressure at individual levels in the community to the legal procedures at higher levels of governance. In the Ethiopian natural resource governance context, instruments are basically originated from the formal legal hierarchy and customary laws at the grass roots level.

The documentary analysis reveals that policies, legal and institutional frameworks shaping the Ethiopian natural resource management and governance system are the main instruments to govern multiple often divergent interests of stakeholders. The Federal Democratic Republic of Ethiopia Constitution (herein after called FDRE Constitution) is the supreme law of the land that governs all laws in Ethiopia. As a result, a number of proclamations, supporting regulations and policies have been made that contain provisions for the protection, management and governance of natural resources and the environment which reflect the principles of the constitution. A substantial body of policies and policy instruments are already in place with a direct or potential bearing on natural resource governance, watershed management and environment. Federal and State laws are the sources of almost all Ethiopian formal law from which other subsidiary laws are derived. Though they are considered as equal, practically Federal laws are more dominant and win over the State laws. In most cases State laws are derived based on the Federal laws. The Federal level has legislative power while the States are in charge of implementing laws, regulations and directives.

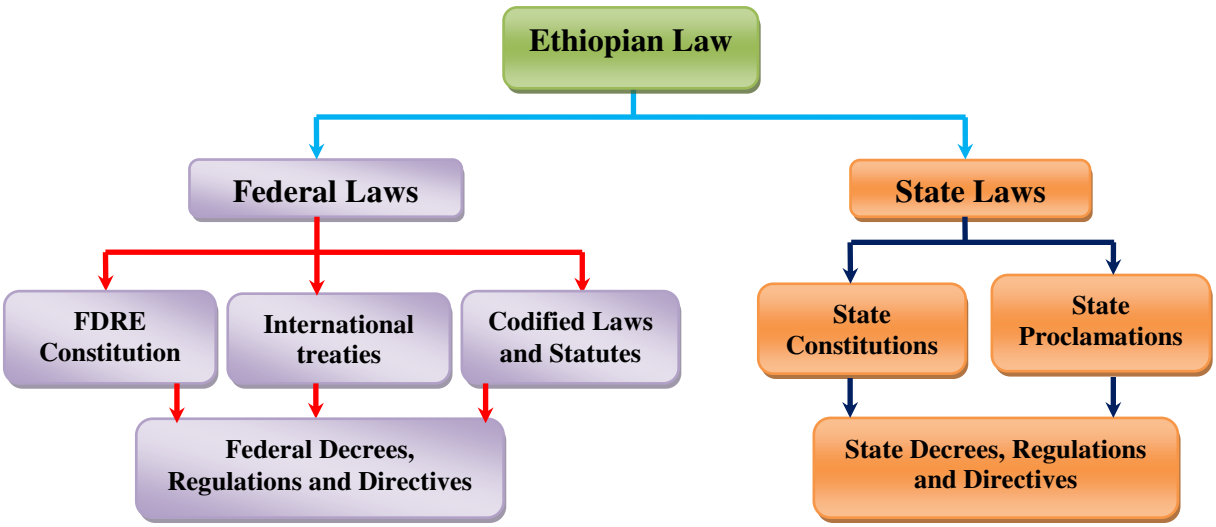


Figure 6.1: Sources of Ethiopian Law: own presentation

6.2.1 The FDRE constitution (1995)

The FDRE constitution was ratified in Addis Ababa by Constitutional Assembly on the 8th of December 1994, and took effect on 21st of August 1995. One of the fundamental principles of the constitution states that, the FDRE Constitution is the supreme law of the land, from which all Laws of the country derive their legal validity from the Constitution. The FDRE Constitution contains 106 provisions 29 of which are dedicated to the recognition of the fundamental political, economic, social, and cultural rights of citizens. It has primacy over all Federal as well as State laws. Article 9(1) of the FDRE Constitution proclaims that any law, customary practice or a decision of an organ of state or public official, which contravenes the Constitution, shall have no effect.

At the Federal level, international agreements and proclamations have the same status as they are issued by the Federal legislature. These are followed by Decrees, Regulations and Directives respectively. When a Decree is adopted by the House of Peoples Representatives (HPRs), it becomes a proclamation. The same order applies to State laws (Girmachew, 2010). The FDRE Constitution has several provisions which have direct policy, legal and institutional significance for the management and governance of the natural resources of the country.

The FDRE constitution further defines the powers and functions of the Federal government and Regional states respectively with respect to the country's resources management and administration. Accordingly, it is the Federal government that has the mandate to enact laws for the utilization and conservation of land and other natural resources including water, fish and wetland resources of the country (Article 51/5) while the Regional states have the mandate to administer land and other natural resources in accordance with Federal laws (Article 52/2/d). This implies that Regional States have to abide by the laws of the Federal government in administering and managing the natural resources within their region. The Constitution specifies that the Federal government shall determine and administer the utilization of the waters or rivers or lakes linking two or more Regional states or crossing the boundaries of the national territorial jurisdiction (Article 51/11))

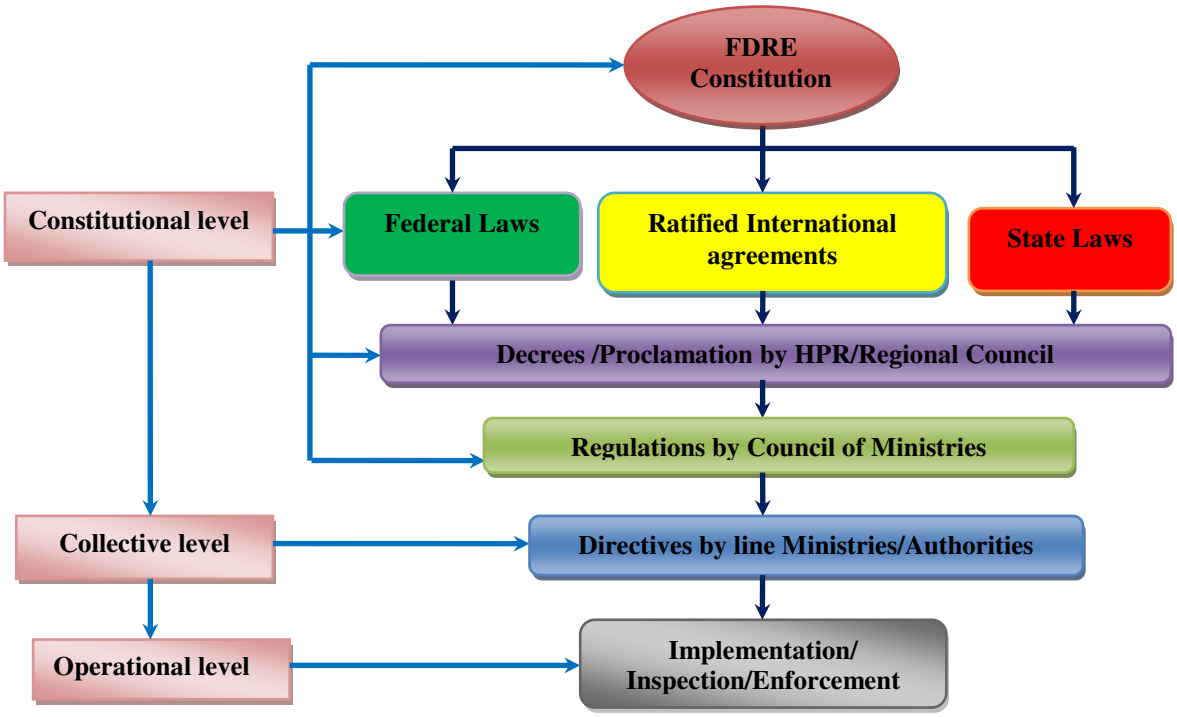


Figure 6.2: Hierarchy of the Ethiopian Law: own presentation

6.2.2 International legal instruments: Treaties, conventions and protocols

The supremacy of the constitution as a fundamental principle states that all international agreements ratified by Ethiopia are an integral part of the law of the land (Article 9/4). Therefore, Ethiopia has ratified and become a party to many of the environmental, biodiversity conservation, cultural and natural heritage, and related conventions and protocols to govern the global commons (see Appendix 3). All these treaties, conventions and protocols are non-self executing and frequently require the development of Federal legislations for implementation. Once ratified these instruments will be automatically parts of the country's legal system. Though these arrangements have their own impact on the country's environmental legislation and policy making process, the implementation process requires strong political will, commitment and devotion of multi-stakeholders.

6.2.3 Natural resource related policies, proclamations, and regulations

In this sub-section, the three pillars of Ethiopian natural resource policies, proclamations and regulations that have a fundamental impact on the overall land based resources are discussed. These pillars include land, water and environmental policies and their derivative proclamations and regulations.

6.2.3.1 Land policy of Ethiopia

Land and its associated resources (soils, water, forests, wetlands, fish etc) are not only the source of all wealth and life necessary for sustaining for human beings but also a crucial component of the governance system at all levels. Land and the administration of land have had a central and often contentious role in Ethiopia's history. In many countries land ownership is not as such treated as a constitutional issue, but in Ethiopia, because of its socio-economic and political importance, land ownership goes beyond being a mere policy matter. Therefore, it is inserted in the FDRE Constitution and the issue of its ownership is considered as a completed subject (Ambaye, 2012).

According to the FDRE Constitution, the right to ownership of rural and urban land, as well as all natural resources, is exclusively vested in the State and in the Ethiopian people (Article 40(3), however, sale, exchange and mortgage of land are strongly prohibited. The FDRE Constitution (Article 40 (3 and 4) further states that, Ethiopian peasants and pastoralists have right to obtain free land for grazing and cultivation without payment and the protection against eviction from their possession. With regard to duration of rural land use right, the proclamation stipulates clearly that the rural land use right of peasant farmers, semi-pastoralists and pastoralists has no time limit (Article 7/1/); whereas the duration of rural land use right of other holders (it is not clear who are these 'other holders') shall be determined by the rural land administration laws of regions (Article 7/2/).

Conversely, the same proclamation stipulates that all holders of rural land could be evicted from their holding for the purpose of public use by Federal and Regional governments (Article 7/3/). The proclamation further states that land holders who will be evicted shall be given compensation proportional to the development he/she has made on the land and the property acquired or shall be given substitute land. In the name of development, all individual land holding with the exception of lease holding can be expropriated at any time the government needs.

On one hand the Ethiopian government claims that the existing land policy that favors state ownership of land is the best mechanism to protect the peasants against market forces and is designed to protect the rural poor and land tillers from eviction by wealthy and urban elite. The government resists privatization because it fears that poor farmers will sell their lands and become landless. However, this land policy, the real source of power in imperial and contemporary Ethiopia, still remains at the center of a controversial policy debate (Crewett *et al*. 2008) among scholars, international organizations and opposition activists. They strongly argue that the absence of tenure security for land users provides little or no incentive to improve land productivity through long term investment; increases transaction costs because of land disputes; and hinders the emergence of a property market such as credit availability/land mortgage. They also fear that government may use land as a political weapon by giving and taking it away from holders (Ambaye, 2012).

There are national, regional and international studies (see for example Bezabeh *et al*. 2011; Fenske, 2011; Deininger *et al*. 2008; Deininger and Jin, 2006; Smith, 2004) that show insecurity of land tenure restricts rights in land, reduces incentives to productively invest in land, and limits transferability of land that ultimately poses significant constraints to agricultural growth and natural resource management. Land that is secure and easily transferable have long been identified as a key element to bring about higher levels of investment and access to credit, facilitate reallocation of production factors to maximize efficiency in resource use, and allow economic diversification and growth (Deininger and Jin, 2006). Since the 1990s the Ethiopian government has begun land registration and certification to provide tenure security to farmers and the government assumes that this certification may improve the holders' perception of their holding right. This was launched at pilot level in a limited number of localities and has since been turned into a major program undertaken at an accelerated rate throughout the country.

In recent times, however there are concerns and fears that the current land lease policy of the Federal government could go beyond the rights of local farmers in different Regions. As Butler (2010) reported, environmentalists and opposition activists claim that the current land grabbing by foreign investors from China, India and Saudi Arabia and local private investors has resulted in the displacement of local farmers from their ancestral land holding. Indigenous people are denied their rights to use and regulate access to their resources, to exercise their customary laws and to control decision making concerning their future. A number of arrests and killing of local farmers who opposed the grabbing were also reported in different Regions. Those who opposed the grabbing are often treated as 'anti-development'. On the other hand, the government stipulated that the land lease policy is aiming at lifting local people out of deprivation and that foreign investors will have to satisfy domestic food needs before they can export.

Federal and Regional land proclamations

The Federal government enacted a Rural Land Administration and Use proclamation (Proc. No. 87/1997) that replaces the proclamation enacted by *Derg* in 1975 (Proc. No. 31/1975). After eight years, Proclamation No. 87/1997 was again repealed and replaced by a new Federal Rural Land Administration and Use Proclamation (proc. 456/2005) in 2005. The new Rural Land Administration and Use Proclamation acknowledges the right to hold and use rural land for peasant farmers, pastoralists who are engaged in agriculture, women and any citizens of country who are 18 years of age and above and want to engage in agriculture (Article 5(1)). By giving priority to peasant farmers/semi-pastoralists and pastoralists, private investors that engage in agricultural development activities have the right to use rural land in accordance with the Federal and Regional investment policies and laws (Article 5 (4-a)). It further states that, Government and Non-Government organizations, social and economic institutions have the right to use rural land in line with their development objectives (Article 5 (4-b)).

This proclamation entrusted Regional states with the power to 'enact rural land administration and land use law' consisting of detailed provisions necessary to implement this Proclamation (Proc. 456/2005) in order to implement the land administration law on Regional level (Article 17). Accordingly, the *Amhara* National Regional State Council enacted the Revised Regional Land Administration and Use Proclamation No.133/2006, by repealing and replacing the previous Rural Land Administration and Usage Determination Proclamation No. 46/2000. Like the Federal Rural Land Administration and Use proclamation, the ANRS revised proclamation confirms the principle of public ownership of land and State dominance, prohibiting its sale and mortgage. The rural land holder has the right to use the land but can also bequeath it and give it to dependants. Parcels may also be exchanged. Further land can be rented for up to 25 years and the contracts can be renewed. This provision is in practice used more or less as a transfer of the user right. Finally the right to land is dependent on residency in a rural area and engagement in agricultural pursuits.

6.2.3.2 Ethiopian Water Resources Management Policy (1999)

Ethiopia is considered as a water tower of the Horn of Africa. The country is endowed with a substantial amount of water resource. It has 12 river basins with an annual runoff volume of 122 billion m^3 of water and an estimated 2.6 -6.5 billion m^3 of ground water potential, which makes an average of 1575 m^3 of physically available water per person per year, a relatively large volume. However, due to lack of water storage infrastructure and large spatial and temporal variation in rainfall, there is not enough water for most farmers to produce more than one crop per year (Awulachew *et al*. 2007). According to World Bank (2006) report the irrigation potential of Ethiopia is estimated to be 3.7 million hectares. However, less than 5% (approximately 200, 000 hectares) is currently under irrigation.

A comprehensive and integrated Water Resource Management Policy was issued in June 1999 (MoWR, 1999) and adopted in 2000. As with any policy, it is essentially an instrument for achieving the intended goals and objectives in a given sector. The policy recognizes that it is based on the constitutional provisions for water resources management and the overall macro-economic, social policies and development policies of Ethiopia. The Policy further declares that water is a common property of all Ethiopians.

Some of the guiding principles are: i) recognition of water as a scarce and vital socio-economic resource to be managed and planned strategically; ii) recognition of water as an economic good; iii) stakeholders to be involved in water resources management. Ethiopian Water Resources Management Policy states that water development should be based on rural centered, decentralized management and participatory approaches, through the participation of user communities and support for community's own initiatives in water resources management. It also mandates community participation, as feasible, in the development and management of dams and reservoirs.

The Ethiopian Water Resources Management Proclamation No. 197/2000

The Ethiopian Water Resources Management Proclamation No. 197/2000 was issued to put the water resources of Ethiopia to the highest social and economic benefit for its people through appropriate protection and due management. The proclamation is currently the basic legal instrument governing the management, planning, utilization and protection of water resources in the country. The purpose of the proclamation is to ensure that the water resources of the country are protected and utilized for the highest social and economic benefits of the people of Ethiopia, to follow up and supervise that they are duly conserved, ensure that harmful effects of water are prevented, and that the management of water resources is carried out properly (Article 3).

The Federal government has also been given the mandate to delegate its powers and responsibilities to Regional states or other bodies for the proper management of the water resources of the country. Accordingly, the ANRS has issued a Regional water resources policy. A draft regulation for the management of water resources has also already been prepared by the Region. By and large, both the water resources policy and draft regulations for water resources management of the Regional state are in line with and similar in their content to those issued by the Federal government. This proclamation also defined the responsibilities and powers of the ministry and defined water permit and dispute resolution guidelines. MoWE is clearly identified as the supervising body in charge of enforcing the provisions of the proclamation. It is entrusted with broad powers of planning, management, utilization administration and protection of water resources. It shall also have the necessary power for the execution of its duties under the provisions of this proclamation (Article 8/1).

The basic thrust of this proclamation is that the social and economic development programmes, investment plans and programmes and water resource management, development and administration activity of any person shall be based on the country's water resources policy, the relevant Basin Master Plan Studies (BMPs) and the Water Resources Laws of the country (Article 6/2). The proclamation also states that management of the water resources of Ethiopia shall be in accordance with a permit system (Article 6/4) and domestic

use shall have priority over and above any other water uses (Article 7/1). The proclamation vested access rights to utilize water resources without holding a permit issued by the supervising body (MoWE) for the following purposes; dig water wells by hand or use water from hand-dug wells, use water for traditional irrigation, artisanal mining and for traditional animal rearing, as well as for water mills (Article 12/1). However, without prejudice to these exceptions, no person shall perform any construction on waterworks, supply water, transfer water, release or discharge waste into a water resource without having obtained a permit from the supervising body (Article 11/1).

Water Resources Management regulation No. 115/2005

These regulations are issued by the Council of Ministers in March 2005 to enforce the water resource management proclamation No. 197/2000. The purpose of the regulation was to provide detailed and specific provisions for the effective implementation of the Water Resource Management Proclamation. The regulations contain a further elaboration of the proclamation providing in detail the main requirements for the issuance of permits for different uses of water and the conditions for the issuance, as well as the level of water charge and procedure for licensing water operators. The regulation further elucidated the application process for permit, issuance, duties of the Supervising Body, discharge of water after use, and conditions for termination, suspension transfer or variation of water use permit. It also provides for the payment of fees and water charges for use to the Supervising Body.

6.2.3.3 Ethiopian Environmental Policy (1997)

The Environmental Policy of Ethiopia was issued in 1997 to provide overall guidance in the conservation and sustainable utilization of the country's environmental resources in general. The overall objective of the environmental policy is to promote the sustainable social and economic development of the country through sustainable management and utilization of the natural resources of the country. Among the specific objectives the environmental policy seeks to achieve are ensuring the conservation, development and sustainable use of essential ecological processes and life support systems, biological diversity and renewable natural resources and the empowerment and participation of the people in environmental management.

In the last two decades, Ethiopia has shown bold political will to ensure environmental sustainability goals of the Millennium Development Goals (MDGs) to meet the needs of the present generation without compromising the needs of future generations. Though there are inefficiencies in implementation at grass root level, Ethiopia has shown its commitment to ensure environmental sustainability by establishing environmental protection agencies at the Federal level and in all Regional states. Several proclamations, including environmental impact assessment proclamation, pollution control proclamation and others have been formulated and are being implemented. In addition, Ethiopia is party to various environmental protection and conservation conventions at international level.

The Environmental Impacts Assessment Proclamation No. 299/2002

The Environmental Impacts Assessment (Proc. 299/2002) is used to predict and manage the environmental effects of a proposed development activity as a result of its design sitting, construction, operation, or of an ongoing one as a result of its modification or termination, entails and thus helps to bring about intended development, to assess the possible impacts of projects and development activities on the environment prior to their approval and implementation.

As general provisions, the proclamation states that, without authorization from the Environmental Protection Authority (EPA) or from the relevant Regional Environmental Agency, no person shall commence implementation of any project or development activities that require environmental impact assessment as determined in a directive (Article 3/1). Further it states that any licensing agency shall, prior to issuing an investment permit or a trade or an operating license for any project; ensure that the Authority or the relevant Regional environmental agency has authorized its implementation (Article 3/3). The EPA is given the legal mandate to assess the impact of any project or program that may threaten the health of the water and the aquatic biodiversity.

With regard to jurisdiction of responsibility, when the project is subject to licensing, execution or supervision by a Federal agency or when it is likely to produce trans-regional impact the Authority is responsible for the evaluation of environmental impact study report and the monitoring of its implementation(Article 14/1). However, if it is unlikely to produce trans-regional impact and the project is not subject to licensing, execution and supervision by a Federal agency, the Regional Environmental Agency in each region is responsible for evaluation and authorization or any environmental impact study report and the monitoring of its implementation (Article 14/2). The proclamation insists on active public participation in the process of environmental impact assessment. The Authority or relevant Regional Environmental Agency are supposed to ensure that the environmental impact study report is accessible to the public and the comments made by the public and in particular by the communities likely to be affected by the implementation of a project are incorporated into the environmental impact study report as well as in its evaluation (Article 15).

6.2.4 User level rules of procedures, bylaws and local convention for CPRs

Local communities in the sub-basin depend to a great extent on CPRs such as water, fish and wetlands. In earlier days, these resources were managed and governed collectively by local groups. These groups used to define the resource boundaries, access and withdrawal rights to these resources. Local leaders selected by the community members prepared draft rules and regulations which were approved by the community members as bylaws for the use of CPRs. However, in recent times the top down resource governance structure covered up the potential roles that could have been played by the local bylaws.

The user level arena is a playing field where formal laws and regulations, informal customary laws and multiple stakeholders interact to come up with certain resource governance outcomes. Local by-laws are one potential means of enhancing trust through the development and official sanctioning of collective choice rules (German *et al*. 2010). Local conventions operate at the social baseline more so than the formal bylaws. Their legitimacy is, therefore, recognized by the stakeholders, and, in terms of peaceful enforcement, only this legitimacy matters (Alinon and Kalinganire, 2008). Local bylaws can facilitate and strengthen partnerships between the natural resource governing bodies and local resource users, connect the decentralized bodies to their constituents at the local level. They can also result from local processes that fill an institutional vacuum created by the absence or weakness of Federal or State laws regarding local resource use (Markelova and Swallow, 2008).

Community bylaws governing Common-Pool Resources

The failure of top-down approaches in the regulation and administration of natural resources has increased attention on the role of decentralized administrative structures, user groups, and customary governance institutions. And yet, community by-laws are at the core of many governance structures that frame the access, use, and conflict resolution around CPRs across Ethiopia and elsewhere in Africa (Markelova and Swallow, 2008).

Community bylaws in this research context stand for the binding rules and regulations enacted by the local community as 'local convention' or with the support of decentralized authority like *kebele* administrators. These bylaws are designed by the community members for the community itself. These conventions are the bases to bind the local community members for the management and governance of their commons. The drivers of community bylaws to exist are the need for social and economic integration as with traditional systems such as '*Equb*' and '*Edir*', and the need to handle disputes and conflict over natural resources.

The household survey and focus group discussion results suggested that, in the study area different community bylaws such as fishery management and utilization bylaws that regulate CPR management and governance exist. But they are not as effective as they were in the past. Resource scarcity, population pressure and lack of support from the formal governance structure are considered as the main factors that affect community bylaws. As population increases, competition over resources increases and resource users were tempted to break their own bylaws. Ultimately, trust and traditional moral values of community members start to decline and these traditional moral values that used to be vital to bind the society together are on the verge of losing ground.

In recent times, customary laws that were common to the rural community to protect natural resources are now challenged by greedy individuals and those who are trying to secure livelihoods (landless and youths). For instance, the common customary laws that were used in Lake *Tana* sub-basin include:

- It was forbidden to cut a big tree in their locality (like Common Assembly Areas) which serves as a shade for community gathering and livestock. In some areas community members consider the trees as sacred,
- It was not allowed to graze the wetlands and communal grazing fields during rainy season,

According to key informants, those who did not abide by the local bylaws were judged by the customary courts. These courts are not established by law, despite their constitutional recognition. They are only recognized, not created, by law. The authority of these courts stems from tradition and local customs. These courts have evolved from traditional elder councils, which do not have legal authority, but carry moral force and still operate widely as primary decision-makers in rural areas throughout Ethiopia.

Box2: Community bylaws for wetland protection

Conflict has detrimental, negative and destructive powers, but conflict can also be a key driver of change. In some cases, the outcome of conflicting situation over the use of wetland resources urged the local users to establish bylaws to protect and conserve their sub-watershed. For instance, community members in *Takusa* district, *Chemhera kebele* developed community bylaws that allowed them to become legal entities in the eyes of the *kebele* council. They realized that they could not manage these challenges on their own and looked to engage other stakeholders such as the *kebele* council. Then the *kebele* council (*ye kebele mikir bet*) approved the bylaws and had started using bylaws for them to protect their unwise use of wetlands. They enacted rules that regulate access and use of CPRs and guarantee their peaceful utilization in their sub-watershed. As a result rules have been made when to use, how to use, how much to use and sanctions for rule breaking etc. For instance the new rules prohibit free grazing during summer season instead they introduced the cut and carry system to feed their animals. The process however was not very short. The process of bylaws formulation started at *kebele* (sub-watershed) level. A committee elected by the community and representing different villages in the sub-watershed drafted the proposed bylaws and they were discussed by the community members. After the draft was agreed by the sub-watershed community, it was forwarded to the *kebele* council and administration. At the beginning, the *kebele* administrators were reluctant towards the formulation and approval of the bylaws but the community members were very keen to have their own rules to protect their commons. Though not yet approved by the district court, the community members are using the bylaws to govern their commons. Eventually, other communities of the 6 adjacent sub-watersheds adopted their neighboring sub-watershed bylaws.

Source: Author, 2011

In Lake *Tana* sub-basin, customary/traditional courts are known as '*shimgilina*' or '*Ye akababi Dagna*'. Community elders (locally called '*Ye ager shimagiles*') are assigned to judge the cases within the community. Mainly they are involved in conflict resolution related to land and land based resource disputes, and other social disputes in their respective community. However, the co-existence of two sets of norms, customary and legal, has influenced the development and refinement of community by-laws, some that had existed for centuries and others that have been recently established. In some localities, customary institutions were outright pushed aside, while others have been successful in harmonizing customary and statutory laws (Markelova and Swallow, 2008).

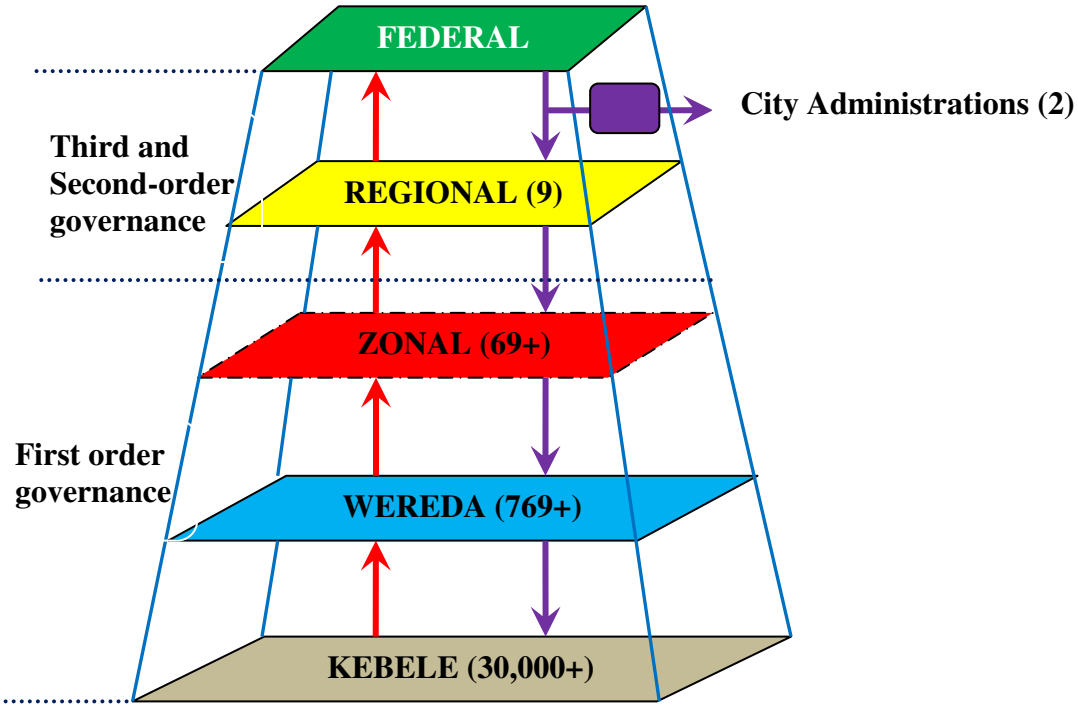
However, as community elders of all sampled districts agreed, local conventions endorsed by the community members were challenged and not fully accepted by some members of the community (particularly youths) as they were before. The reasons are firstly, there was no or minimal support from the government to approve as soon as possible and support the local conventions. *Kebele* administrators and district officials considered those who were self-motivated groups to conserve their commons and opposed development pressures on CPRs as anti-development. As a result some of the greedy individuals were using this gap as an advantage to misuse the CPRs. Secondly younger generations who are mostly landless were not willing to comply with the local convention assumed to be devised by community elders.

As a result, they are in continuous dispute with the community members. They are claiming the wetlands and other protected areas for cultivation. Thirdly, the existing community organizations were too weak to exercise their collective leadership over their CPRs. Weak community organizations and bylaws mean that local people are not knowledgeable about their CPRs and their right and they lack the capacity to devise sound community bylaws and norms for managing their CPRs; this resulted in inability to control illegal encroachment of the valuable resources in their locality.

6.3 The Governors: The Legislature, Executive Agencies and Authorities

The Ethiopian governance structure is organized into Federal, Regional, Zonal, *Wereda*/District and *Kebele* structures (see Figure 6.3). The FDRE Constitution established the Federal structure based on nine ethnic Regional States and two City Administrations (Article 47). The constitution also established two representative bodies for the Federal government, namely, the House of Peoples' Representatives (HPRs) and the House of Federation (HF). The House of Peoples' Representatives has legislative and oversight functions while the House of Federation has a constitutional role to safeguard the interests of the nations and nationalities of Ethiopia. The Federal state is responsible for all powers not delegated to or shared with the regions (Article 51). The regional governments are responsible for formulating and implementing economic, social and development policies and for maintaining public order, including administrating a police force (Article 52).

The governance structures at the Region, Zone, *Wereda* and the *Kebele* level follow the same tripartite structure which comprises of an elected head of administration, a council with an executive committee and a sector bureau. Zones are an active administrative institution in *Amhara* and Southern Nations Nationalities and Peoples (SNNP) and oversee the *Wereda* functioning whereas in Oromia and Tigray regions they do not play a significant role. Below the Zones and *Weredas* are *Kebeles* with an average population of 5,000 and *Kebeles* are not budgetary units (Yilmaz and Venugopal, 2008).



↑ =The upward arrow indicates that accountability and feedback flow from the bottom up to the next hierarchy where reporting is one of communication style.

↓ = The downward arrow indicates the budget flow (except, *kebele*s do not receive financing from *Weredas*), the rules of law and chain of command**.**

Figure 6.3: The FDRE governance structure
Source: own presentation

6.3.1 Third-order or meta-governance (Macro level)

The House of Peoples' Representatives (HPRs) is the highest authority of the Federal government (FDRE Constitution, Article 50/3). The House is responsible to the People. The State Council is the highest organ of State authority. The highest executive powers of the Federal government are vested in the Prime Minister (PM) and in the Council of Ministers. The PM and the Council of Ministers are responsible to the House of Peoples' Representatives (HPRs). The role of the Federal institutions is relatively clear, more related to upstream policy and legal formulation, while that of Regional bureau agencies is more related practical on the ground implementation.

The House of Peoples' Representatives (HPRs)

The highest legislative authority in all matters assigned by the constitution to Federal jurisdiction is vested in the House of Peoples' Representatives (HPRs) Article 55 (1), which is comparable to the first or lower chamber of a legislature, normally serving the interests of the people in the federation as a whole (Girmachew, 2010). With regard to natural resource governance, the House of Peoples' Representatives (HPRs) are given power to enact laws on the utilization of land and other natural resources, of rivers and lakes crossing the boundaries of the national territorial jurisdiction or linking two or more States (Article 55 (2) (a)). It has also been vested to approve general policies and strategies of economic, social and development of the country including all environmental and natural resource related policies (Article 55 (10)).

The Federal government

The Federal government vested the powers and functions to formulate and implement the country's policies, strategies and plans in respect of overall economic, social and development matters, (Article 51 (2)), to enact laws for the utilization and conservation of land and other natural resources, historical sites and objects (Article 51 (5)). Besides, the Federal government is given power to determine and administer the utilization of the waters or rivers and lakes linking two or more States or crossing the boundaries of the national territorial jurisdiction (Article 51 (11)).

Council of Ministers (CM)

The Council of Ministers comprises the Prime Minister, the Deputy Prime Minister, Ministers and other members as may be determined by law. With regard to the governance of natural resources, the Council of Ministers is vested power; to issue regulations necessary for the proper implementation of proclamations, laws and decisions and the observance of law and order adopted by the House of Peoples' Representatives, to decide on the organizational structure of ministries and other organs of government responsible to it, to formulate and implement economic, social and development policies and strategies.

The Regional States/government

The FDRE Constitution, Article 52 (1) states that 'all powers not given expressly to the Federal government alone, or concurrently to the Federal government and the States are reserved to the Regional States'. Accordingly, power is given to the Regional states to formulate and execute economic, social and development policies, strategies and plans of the state (Article 52/2/c) and to administer land and other natural resources in accordance with Federal laws (Article 52/2/d). The Regional government is involved in enacting state constitutions; establishing state administration; formulating and executing economic, social, and development policies; administering land and natural resources; levying and collecting taxes and duties; enacting and enforcing the state civil service; and establishing and administering the state police force.

6.3.2 Second-order governance (Meso level)

Second order governing actors focus on institutional arrangements within which first-order governing takes place. The arrangements include systems of agreements, rules, rights, laws, norms, beliefs, roles, procedures and organizations that are applied by first-order governors to make decisions. At this level authorities assigned to execute proclamations and regulations are responsible to issue directives and guidelines for the proper implementation of laws. At this level of governance, relevant governing bodies which are responsible to monitor and control the implementation of rules and regulations related to natural resource

management and governance enacted by the higher level governance structures are discussed.

Environmental Protection Authority (EPA)

The Environmental Protection Authority (EPA) was first established under the proclamation No. 9/1995. This was considered as the most important step towards setting up the legal framework for regulation of Ethiopian environmental issues. Under this proclamation, the Authority was accountable to the council of ministers with the following important powers and duties (Article 6) to; prepare environmental protection policy and laws; and, upon approval, follow up their implementation, prepare directives and systems necessary for evaluating the impact of social and economic development projects on the environment; follow up and supervise their implementation and to prepare standards that help in the protection of soil, water and air as well as the biological systems they support, and follow up their implementation.

Organization of the Authority was based on an Environmental Protection Council comprising of different line ministries at Federal level. However, assigning responsibilities to separate organizations for environmental development and management activities on the one hand, and environmental protection, regulations and monitoring on the other, is instrumental for the sustainable use of environmental resources, thereby avoiding possible conflicts of interests and duplication of efforts. It has become necessary to establish a system that fosters coordinated but differentiated responsibilities among environmental protection agencies at Federal and Regional levels. As a result, EPA was again re-established under proclamation No. 295/2002 with more comprehensive powers and duties. In the previous proclamation the authority vested about 10 powers and duties; however the re-establishment proclamation added more than 16 powers and duties. Under this proclamation the authority is accountable directly to the Prime Minister.

Major responsibilities for the protection of the environment in Ethiopia are vested on the EPA, which is a Federal government organ legally mandated to formulate policies, strategies, laws and standards, which foster social and economic development in a manner that enhances the welfare of humans and the safety of the sustainable environment, and to spearhead in ensuring the effectiveness of the process of their implementation. Its tasks include the administration of the main environmental issues such as environmental pollution control and environmental impact assessment.

There are also other organs of the government with one or more responsibilities relevant to the protection and management of environment and natural resources. EPA is responsible to coordinate actions of other sectoral governmental bodies to ensure the implementation of basic environmental rights provided under the 1995 FDRE constitution and principles set out in the environmental policy of the country. EPA is responsible for the administration of environmental protection at the Federal level and deals exclusively with environment matters at national and international level. While EPA is the focal point and coordinator of the international conventions and agreements regarding environment and bio-diversity, the implementing institutions and major stakeholders are different institutions.

Ministry of Agriculture (MoA)

Proclamation No. 4/1995 which defines the powers and duties of the executive organs of the Federal Democratic Republic of Ethiopia states that, Ministry of Agriculture (MoA) has the powers and duties to: cause the expansion of agricultural development, prepare land use policy as well as draft laws on the conservation and utilization of the forest and the wildlife resources. In addition, a Proclamation No. 471/2005 that repealed the previous proclamation redefines the power of the ministry to devise and facilitate the implementation of a strategy for natural resources protection through sustained agricultural development. The Ministry of Agriculture has the responsibility to implement Rural Land Administration and Use Proclamation No 456/2005, by providing the necessary professional support and by coordinating the competent authorities.

Ministry of Water and Energy (MoWE)

Proclamation No. 4/1995 established the Ministry of Water Resources (MoWR) as the Federal authority responsible for oversight of water development throughout the country. Under this proclamation, MoWR has the power and duty to initiate policies and laws, prepare plans and budget and, upon approval, implement same (Article 10/a); ensure the enforcement of laws, regulations and directives of the Federal government; to determine the conditions and methods required for the optimum allocation and utilization of the water that flows across or between more than one Regional government among various users, prepare draft laws concerning the protection and utilization of water resources, sign international agreements relating to trans-boundary Rivers in accordance with the Law.

Proclamation No. 471/2005 that repealed the previous proclamation vested additional power to MoWR to administer dams and hydraulic structures constructed by Federal budget unless they are entrusted to the authority of other relevant bodies. Proclamation No. 471/2005 was again repealed by proclamation No. 691/2010 to re-structured MoWR into Ministry of Water and Energy (MoWE) to promote the development of water and energy and undertake studies concerning the development and utilization of energy and promote the growth and expansion of the country's supply of electric energy.

Among MoWE's duties are inventory of water resources, allocation of water resources, establishing standards for design and construction of waterworks, issuing guidelines and directives for the prevention of pollution of water resources as well as for water quality and health standards, establishing water users' associations, and settlement of disputes. Details of most of the provisions of the Proclamation are expected to be provided in Regulations to be issued in the future. Ministry of Water and Energy is also responsible and mandated to take in cooperation with the appropriate Federal, Regional and city Administrations organs actions necessary to implement water and energy related national proclamations and international conventions, treaties and protocols such as the Ethiopian Water Resources Management Proclamation (Proc. No. 197/2000)

Regional Level

Regional Bureaus of Agriculture, Environmental Protection and Land Use and Administration, Water resource and Energy, have the power to manage and administer all land based resources based on the laws, policies and rules and regulations enacted by the HPRs, Council of Ministries and their respective ministries at the Federal level. Usually they act as a medium of translating, and implementing the rules of the game enacted at the constitutional level to the operational level.

6.3.3 First-order governance (Micro level)

First-order governing takes place at local governance level wherever people, and their organizations, interact in order to solve societal problems and create new opportunities. *Local governance* is defined as the formulation and execution of collective action at the local level. Thus, it encompasses the direct and indirect roles of formal institutions of local government and higher level government hierarchies, as well as the roles of informal norms, networks, community organizations, and neighborhood associations in pursuing collective action (Shah and Shah, 2009). The local level governance recognizes two important but different organizations. These are the local level zonal, district and *kebele* administrations acting as and part of the government, and the community governed by its own institutions (local rules and regulations) and organizations either formal or informal.

Zones, District and *Kebele* level administrations

According to the *Amhara* Regional State Constitution (herein after called ANRS Constitution), the Regional state is hierarchically structured in such a way as to comprise the Regional, District, and *Kebele* administrative units (Article 45/1). It also states that, the 'Regional council may establish other administrative hierarchies as deemed necessary'. Therefore, Zones are administrative units below the Regional state and above district administrative which were established to fulfill additional responsibilities. Zones are usually responsible for coordinating among districts and monitoring district level issues and are used as a bridge to connect Regional states to the lower levels (districts and *kebeles*).

Districts on the other hand are the 3rd level administrative divisions of Ethiopia below Regional and Zonal administrations. Though districts are not mentioned in the FDRE constitution as an administrative organ, they are indicated in the ANRS Constitution. The Constitution vested power, where districts are empowered 'to prepare and decide on economic development and social service plans' for its territorial area (Article 84/1). While districts are elected levels of government, they are also accountable for implementing directives from above (from the Regional state or the zones). Districts are in charge of implementing 'policies, laws, regulations and directives issued by the regional state organs'. Moreover, 'each and every district is a body hierarchically subordinate to the regional government' (Article 84/2).

In addition to Federal and Regional authorities, district/*wereda* and urban administrators are vested power to expropriate rural land holdings. Expropriation of Landholdings for Public Purposes and Payment of Compensation Proclamation No. 455/2005 Article 3(1) states that;

> *'Wereda or an urban administration shall, upon payment in advance of compensation in accordance with this Proclamation, have the power to expropriate rural or urban landholdings for public purpose where it believes that it should be used for a better development project to be carried out by public entities, private investors, cooperative societies or other organs, or where such expropriation has been decided by the appropriate higher Regional or Federal government organ for the same purpose'.*

The district council vested power to examine and approve the draft economic development social services, follow up basic agricultural development activities, conservation and care of natural resources (Article 86/2). Districts are managed by local governments. Since 2002, governance was devolved to district level. Decentralization was undertaken with the transfer of power and resources to districts. These districts are said to be more authoritative and autonomous in decision making regarding natural resource management and governance. However, with regard to staffing and budgeting, they are dependent on the Regional government. Still they have significant limitations in the degree of autonomy, accountability and capacity.

Kebeles are the lowest governmental administrative units serving as local-level institutions in both rural and urban areas. Along with elected local councils, the *kebeles* have executive cabinets which coordinate planning and administrative functions; these are selected by the members of the local councils. They respond to the districts' directives, and rely upon the districts for their budgets (Tegegne and Kassahun, 2007). In the study area four sets of institutions have roles in natural resource management and governance at the local level: *Kebele* Administration, Land committee elected by the community members, Land Administration experts and traditional institutions (like Community elders) for dispute resolution.

6.4 Modes of CPR governance and property rights in Lake Tana sub-basin

Modes of CPR governance

As mentioned in the earlier chapter (chapter 2 section 2.6), the three modes of governance recognized by the interactive governance framework; hierarchical, co-governance and self-governance, are all possible, depending on the properties of the systems that are being governed, the capacity of the governing systems, the quality of their interactions (Kooiman *et al*. 2008) and the type of property rights regime at different periods. The modes of each CPR governance system in Lake *Tana* sub-basin however, are characterized by different modes of governance at different times. For instance, prior to the introduction of modern/commercial fishery in Lake *Tana*, traditional self governance (in which stakeholders take care of themselves, outside the purview of government) was the dominant governance mode. The *Negede woyto* community was the dominant fishing community where they used to govern the fishery sector traditionally. Management authority and decision-making power rested with the resource users. Still self governance may occur at user level particularly among members of fishery cooperatives, where they can use their bylaws and local agreements to settle disputes and conflict of interests among fishers.

After 1986, co-governance arrangements started, where organized fishery cooperatives and Bureau of Agriculture (BoA) share co-governance responsibilities. In the co-governance perspective, parties co-operate, co-ordinate and communicate 'sideways', without a central or dominating governing actor (Chuenpagdee, 2011). Various civil societies such as Ethiopian Orthodox Tewahido Church and two Dutch NGOs (ISE-Urk and ICCO-Zeist) were also involved in the governance system.

However, since 2003 the government has been trying to change the governance mode and structure into a hierarchical one. Even though it is not implemented yet, they were trying to impose the Fishery Development and Utilization Proclamation and its regulation on to the fishery sector, so that BoA vested the power to control and monitor the overall fishery activities in Lake *Tana* jurisdiction and other water bodies of the region. According to the national Fishery Development and Utilization Proclamation No. 315/2003, the fishery inspector, who is going to be authorized by the Ministry of Agriculture or by the concerned Regional Authority has been vested the power to implement the proclamation, regulations and directives. Surprisingly, even after 10 years, the fishery inspector was not assigned and directives were not prepared, which resulted in the fishery sector being unprotected and uncontrolled.

Very recently however, the Ministry of Agriculture (MoA) is trying to change the management and governance modes of the fishery sector into a co-management and governance system where different stakeholders can participate in the management and governance system. In 2009, MoA expressed to the ACP Fish II programme a desire for support to help introduce improved fisheries management and a more co-management style approach to the management of the country's fisheries. Accordingly, in 2011 ACP Fish II Project conducted a 7 day training on Fisheries Management Planning for fishery officers and preparation of draft Fisheries Management Plans (FMP) for Lake Ziway and Lake Chamo which are seen as the most overexploited and yet commercially important Rift Valley Lakes.

The mode of governance with regard to wetland commons is said to be blurred. Though this research found that most (73%) of the community members believed that wetlands are governed by the government hierarchy, still there are ambiguities towards who is in charge of controlling and administering these resources (see Table 6.1). Despite the existence of ownership rights of the broad land based resources at the constitutional level, there is no ownership right vested to the local community at operational level. Outside the government structure, local and international NGOs such as Ethio-Wetland and Natural Resource Association (EWNRA), which promotes sustainable resource use, raises awareness and mobilizes the local community, are also taking part in the management and governance of natural resources.

According to stakeholder workshop participants, with the exception of the water resource which is solely administered and governed by central government, the hierarchical mode of natural resource governance is often decentralized to the lowest level of governance without lower level capacity building and clear responsibilities has affected CPR management and governance in the sub-basin. As a result, key management concerns such as uncontrolled resource use pattern, loss of species and serious environmental degradation casts doubt on the sustainable use value of CPRs in the sub-basin.

As mentioned earlier, though the supreme Law vested power to the Federal government to determine and administer the utilization of the waters or rivers and lakes linking two or more States or crossing the boundaries of the national territorial jurisdiction, Lake *Tana* is exclusively within the jurisdiction of *Amhara* National Regional Sate. It doesn't cross any Regional and national boundaries. In principle, the Regional state has to have its own stake, in controlling and administration of Lake *Tana*. However, by considering Lake *Tana* as a national and international common, administration and governance is dominated by a hierarchical mode of governance where characteristics of the interactions between the state and its citizens are a top down style of intervention (Bavinck *et al*. 2005).

Development planning decisions and implementation in Lake *Tana* sub-basin are solely determined by the central government hierarchy. In the name of international water resource, the Federal government has vested an exclusive power over the decision of Lake *Tana* development activities. As a result, the Regional government (ANRS) has no significant decision role or to administer and control major development interventions like hydropower, large irrigation dams etc.

Generally, government hierarchy is the dominant mode of CPR governance in Lake *Tana* sub-basin. International studies on CPR also confirm that, the State has often been nominally responsible for managing many CPRs. According to Agrawal *et al*. (2008) 86% of forests and wooded areas across the world are owned by central governments which in turn affect the degree to which the State protects, manages use, restricts access or exploits CPRs also affects rural households that depend on CPR income for their livelihoods.

The survey of resource users on who controls the CPR use, management and governance also confirmed that government is dominating control over the resources. The majority (73%) of the respondents replied that the government at different levels (*kebele*, district and regional level) of hierarchy is controlling the CPRs. Still 15% of the respondents believed that, though government is dominant there are situations where community members and government jointly control the CPRs (See Table 6.1).

Table 6.1: Respondents perception of who control CPRs (n=200)

Who has control over CPRs?	**(n=200)**	
	Frequency	**Percent**
The Government	146	73.0
Community and Government jointly control	30	15.0
The Community	10	5.0
Private/individually	4	2.0
It is not clear who controls	10	5.0
Total	**200**	**100.0**

Source: Own survey result, 2011

Property rights issues of CPRs

Property rights consist of two components: the rule and its enforcement mechanism. The rules may derive from state law, customary law, user group rules, and other frameworks. Enforcement of statutory law is usually the responsibility of the state, which means that the rights are based on formal laws (Crewett *et al*. 2008). In Ethiopia, property rights are protected by law, though enforcement is weak. The Ethiopian government is following a public trust doctrine, a legal principle dating back to Roman law in which the state holds certain resources particularly land and other land based resources in trust for its citizens, prohibiting any transfer of those resources to private interests. Based on this premise the FDRE Constitution vested an exclusive power to the state and Ethiopian people. However, property rights issues of natural resources are still debatable. In 2011, Ethiopia scored 30 out of a possible total score of 100 on the property-protection index of the Heritage Foundation and was on a downward trend on the property-rights indicator of the 2011 Ibrahim Governance Index[17] (AEO, 2012).

Common-pool resources are defined in the Ethiopian context as 'a resource system that is considered as non-exclusive recourse to which the rights of the use are distributed among a user group. Individuals are not entitled to use and own these resources privately. Though these descriptions are still ambiguous (see Table 6.2), CPRs in Lake *Tana* sub-basin thus include communal grazing lands, forests, wetlands, fisheries, rivers and Lake *Tana* itself. According to group discussants and key informants, there is still confusion with regard to rules for access, withdrawal and management of CPRs at local level. They further argued that this confusion might be as a result of unclear definitions of property rights, often misunderstood by the users and executive agencies.

[17] **Ibrahim Governance Index**- is Africa's leading assessment of governance, funded and led by an African institution compiles 86 indicators grouped into 14 sub-categories and four overarching categories to measure the effective delivery of public goods and services to African citizens.

For instance, the ANRS Rural Land Administration and Use Proclamation No. 133/2006 defined 'communal' land holding as if it is out of the ownership of the government or private holding and it is exclusively for communal use (see Table 6.2). However, the Federal Rural Land Administration and Land Use Proclamation No. 456/2005 portray as if it is given by the will of the government to the local residents. It doesn't recognize the natural ownership rights of the community. As a result, CPR users are not confident that these commons belong to them. The Federal Rural Land Administration and Use Proclamation No.456/2005, clearly shows that the Federal government may claim any CPR at any time as deemed necessary.

> *'Government being the owner of rural land, communal rural land holdings can be changed to private holdings as may be necessary'*- Article 5(3).

This confusion has been the center of disputes in different areas particularly when these communal lands are leased for investors and/or used by the government for the construction of social services such as school, health post and local administrative offices.

Table 6.2: Definitions of land holding in *Amhara* Region and Ethiopia

Definition of holding	**Revised ANRS Rural Land Administration and Use Proclamation**	**Federal Rural Land Administration and Land Use Proclamation**
Communal	Rural land which is ***out of the ownership of the government*** or ***private holding*** and used by the local people in common for grazing, forestry and other social services (Article 2/5)	Rural land which is ***given by the government*** to local residents for common grazing, forestry and other social services (Article 1/12)
Common	Holding of land by two or more persons in common having the holding right, and use without division, by sharing the output from the land (Article 2/10)	Not mentioned
State	Rural land ***demarked*** and held by Federal or Regional Government for country and area development and growth, and it includes forest lands, wild life sanctuaries, mining lands and parks as well as ***lands around lakes and rivers*** (Article 2/7)	Rural land ***demarcated and those lands to be demarcated in the future*** at Federal or Regional states holding; and includes forestlands, wildlife, protected areas, state farms, mining lands, ***lakes, rivers and other rural lands*** (Article 1/13)
Private	A land possessed by any farmer or other body vested with right to use it and existing under private holding having a certificate (Article 2/9)	Minimum private holding means rural land in the holding of peasant, semi pastoralists and pastoralists and other bodies who are entitled by law to use rural land (Article 1/11)

Source: Proclamation No. 133/2006 (Revised Amhara Regional) and 456/2005(Federal)

In order to understand the roots of and possible solutions to such conflicts and confusions, there needs to be rigorous and complete analysis of all interests when developing or revising a management regime. Property rights provide a clear theoretical basis for performing such an analysis. Property rights evaluation is a useful tool because it allows comparisons across different stakeholder groups (Yandle, 2007). As discussed in chapter 2 section 2.5.2.3 Table 2.3 the concept of 'bundles of rights' as developed by Schlager and Ostrom (1992) is useful for our purpose to analyze the existing distribution of rights among different user groups and between individuals under the current tenure regime in Lake *Tana* sub-basin.

Access and withdrawal are operational-level property rights, whereby access is the right to enter a given CPR system, and withdrawal involves the permission to extract products from the resource system (Schlager and Ostrom, 1992). An examination of the property rights issues of the CPRs in Lake *Tana* sub-basin shows that, the FDRE Constitution explicitly states the Ethiopian people and the state have exclusive right to ownership of the rural land and other natural resources presumably water, fish and wetlands. However, except access and withdrawal rights, local community members and other stakeholders have no full ownership right on CPRs, whereas the right to sell or lease, management and exclusion rights is solely vested to the State, particularly the Federal government (see Table 6.3).

Table 6.3: Property rights issues for CPRs (fish, water and wetlands)

Level of right	Property rights	Stakeholder group			
		The State	Local community	Private	Others (such as NGOs)
Operational	Access	√	√	√*	√*
	Withdrawal	√	√**	√*	√*
Collective choice	Management	√	√	×*	×*
	Exclusion	√	×?	×**	×
	Alienation	√	×	×	×

Source: The outcome of Stakeholder analysis workshop and Focus group discussion, 2011

Key
√ - Permitted
√*- Access and/or withdrawal of fish/water/wetland resources is allowed if and only if the stakeholders have a license or a particular permission
√**- Withdrawal of water and fish is permitted without license only for small scale irrigation and household consumption up to 3kg of fish per day, respectively.
×? - In some cases communities may have the right to exclude others (except the State) from their commons
×*- In some cases stakeholders may be involved in management process up on the request of the State and/or the Community
×**- Private investors may have the right to systematically exclude other users by enclosing the commons, if they are allowed to do so.
×- Not permitted

According to the existing FDRE Constitution, it is completely not allowed to sell land and use as a mortgage. Though the people and the State have vested an equal and exclusive right, land holders can lease their land for about 25 years while the State can lease the land for a long time (about 99 years). Local farmers and most of the key informants in the study area considered that leasing the land for almost 99 years by the State is equivalent to selling the land. Therefore, if they were not allowed to sell and lease their land for relatively longer period, the State has to be also restricted by law from such a prolonged leasing. However, in the name of 'development' and 'attracting foreign investment', the current scenario of leasing farmland and communal lands for local investors and 'Land grabbing' by foreign private investors and governments in Ethiopia demonstrated the exclusive power of the central government (particularly the Federal government) over land and land based natural resource ownership.

For instance, around *Bahir Dar*, the so called floriculture investors were given land by expelling local farmers through an unproductive compensation scheme where some of the compensated farmers were not able to manage their money appropriately. However, for almost 3-4 years they did not start production and the lands were unused for these periods. On the other hand, companies and foreign governments have been leasing for long term (for about 99 years) large areas of land in different parts of Ethiopia. As reported by Dessalegn (2011) in 2011, about 3.5 million hectares were allocated to foreign investors, while the projected figure for 2015 is 7 million hectares.

According to Ethiopian Press Agency (October 1, 2012), the Ministry of Agriculture (MoA) has transferred 70 thousand hectare tracts of land to both domestic and foreign investors in 2011/12. The MoA has also planned to transfer more than 100 thousand hectares of land to investors in 2012/2013. For this, it has prepared large fertile tracts of land in *Gambella*, *Benshangul-Gumuz*, *Oromia* and *Amhara* regional states to be offered to investors. Though the Ethiopian government proudly claims 'Land grabs' benefits the local community, still there are many concerns that poor villagers will be forced off their lands and the environment could also deteriorate.

6.5 Chapter summary

In summary, this chapter sought to describe and analyze the institutional arrangements that govern Ethiopian natural resources at different levels. The outcome of the research questions shows that though there is no specific CPR governance system, the overall natural resources governance system in Ethiopia comprises of a system of formal national and international laws, regulations, treaties and procedures, and informal conventions, customs, and norms, which broaden, mould, and restrain socio-economic activity and behavior of multi-stakeholders at different level of governance. Ethiopia is a signatory of multiple international treaties on environmental and resource governance. However in practice, neither the international treaties and conventions, nor the domestic rules and regulations were not well implemented as deemed to address the intended objectives or problems.

Particularly, Lake *Tana*'s CPR governance system is composed of the formal Federal and State laws, informal customary laws and user group informal rules, and relationship between organizations stretching from the Federal level to the local *kebele* administrative level. While the core of state authority in the Lake *Tana* sub-basin currently lies at Federal level, Regional government, Bureau of Agriculture, Bureau of Water and Energy and Bureau of Environmental Protection Land Use and Administration exercise their limited power over controlling and monitoring natural resources in their jurisdiction.

In summary, the broad natural resource management policy, legislations and strategies in Ethiopia seem adequate at a constitutional level. However, the enforcement of legislations and implementation of policy and strategies at grassroots level is not satisfactory. Despite the fact that there are plenty of top-down governance structures, they are not resulting in a coherent system of governance at the operational/local level. Particularly with regard to CPR, property rights issues, mandates of stakeholders who are supposed to administer resources are not clear. On the other hand traditional resource management and governance institutions in Ethiopia, specifically in the study area, are losing ground to effectively manage and govern local level resource systems.

CHAPTER SEVEN

7. REALITIES ON THE ACTION SITUATION

7.1 Introduction

Action situation which comprises individual actors within the biophysical, social and institutional context is influenced by three categories of contextual factors: namely nature of the resource (physical condition), attributes of the community (social and cultural context) and rules in use (institutional arrangements) discussed in chapter 4, 5 and 6 respectively. The action situation with which this study is primarily concerned is positioned on the local level CPR governance system. Accordingly Lake *Tana* sub-basin is addressed as local action arena. As discussed in chapter 5 section 5.4, the actors within the local action arena include all stakeholders who have an interest in and control over CPR use, management and governance. According to Stellmacher (2007), the structure of the action situation can be depicted as follows: actors/stakeholders make choices in the context of positions that are held by other actors/stakeholders. Each actor in this position has an array of potential actions available that he/she may take within a specific period of time. Some actors have only limited control over the actions they can take as their actions depend on the agreement of other actors.

As the discussed in chapter 6 and explained by Meinzen-Dick and Pradhan (2002), there is not one single or consistent set of rules governing the action arena. Rather, there is legal pluralism-the coexistence of multiple different types of rules: international, national, customary and local norms, and even voluntary guidelines or corporate social responsibility standards-each backed by a different institutional framework. Therefore, the aim of this chapter is to disclose the realities on the action situation where the attributes of the system to-be-governed (discussed in chapter 4 and chapter 5) interacts with the governance system (discussed in chapter 6). The governance system is evaluated from different perspectives and gaps are identified. The process inquires to what extent the actors involved in the governance system are interacting in the action situation to ensure sustainable common-pool resource use, management and governance.

7.2 Understanding patterns of multi-stakeholder interaction

Patterns of interaction flow logically from the behaviour of actors in the action arena (Polski and Ostrom, 1999). Actors/stakeholders may differ in relation to types of actions that they are required, permitted, or forbidden to take in a certain action situation (Schlager and Blomquist, 1998). The differences designate pattern of interaction between the various actors/stakeholders which finally determine the outcome, in this research context, the way how stakeholder use, manage and govern the CPRs (Stellmacher, 2007).

If a well managed and enabling environment is put in place, multi-stakeholder interactions facilitate stakeholders to work together, to solve societal and environmental problems. Multi-stakeholder interactions may lead to understanding of different interests and perspectives of stakeholders in the process of CPR use, management and governance. In a very complex scenario like Lake *Tana*'s CPRs, however, the likelihood of positive outcomes from the multi-stakeholder interaction is rarely possible. Stakeholders make choices based on their own preferences, objectives or mandates (in the case of government agencies). These individual choices lead to aggregate patterns of interaction that affect user based CPR management and governance.

Lake *Tana* sub-basin is an example of a constantly changing and very complex CPR system whose water resource, commercial fishery, surrounding wetlands and other associated resources are managed and governed by different property rights regimes, involving a wide range of issues and multiple stakeholders with diverse power over and interests in CPRs. Hence to better understand this scenario the patterns of multi-stakeholder interaction and their outcomes were evaluated based on stakeholder participation in legislation, planning, policy making and implementation processes, linkage and collaboration among relevant stakeholders, organizational capacity and commitment, managing CPR related externalities (such as conflict of interest).

Multi-stakeholder interaction SWOT analysis reveals that Lake *Tana* sub-basin's CPR management and governance interaction is characterized by weak organizational capacity of key stakeholders, low organizational culture and commitment, overlapping mandates of stakeholders, weak linkage between informal institutions and formal governance structures, lengthy law making and implementation processes. As a result, these multi-stakeholder interactions lead to competition, overexploitation and degradation of CPRs that ultimately lead to conflict of interests among different stakeholders at different levels.

7.3 The outcomes of the governance interaction

The outcome of the action arena is what actually 'happens' to the resource governance system. It describes how human-nature interaction comes about under the prevailing circumstances influenced by the characteristics of actors and the action situation in the action arena as well as influencing exogenous variables discussed in the previous chapters (Stellmacher, 2007). What happens in the action arena leads to patterns of interaction and outcomes that can be judged on the basis of evaluative criteria (Ghorbani *et al*. 2010).

7.3.1 The state and sustainability of the resource systems

Lake *Tana* Ecosystem has a global significance on which huge livelihood, economic and socio-cultural groups are highly dependent. The ecosystem is a complex and multipurpose resource system whose water/river system, fishery, wetland and other associated resources are considered as key drivers for Ethiopia's development endeavor. As a result, the catchment is selected by the Ethiopian government as a potential growth corridor for development and reducing food insecurity. Chapter 4 has shown that the natural sub-system (in this case Lake *Tana* ecosystem) is under serious pressure both from the natural calamities and human induced externalities. The outcome of the analysis suggests that, despite the positive impact on the country's drive towards achieving food security, through the Growth and Transformation Plan (GTP), development activities that have been taking place in and around Lake *Tana* Ecosystem can be questioned in terms of sustainability.

Development pressure coupled with unprecedented population growth in the region is creating an ever increasing pressure on Lake *Tana* ecosystem. As a result of ineffective resource governance, population pressure, a one-sector (water) development approach by the government (discussed in chapter 6) and subsequent demand for livelihood security, there are frequent encroachments that result in widespread destruction of biodiversity and ecosystems in the sub-system. Fish stocks are declining leaving more people, who are dependent on the fish sector to secure their livelihood vulnerable to seasonal shocks. Populations of endemic fish species are also declining. Over the past two decades wetlands have been destroyed. Current ongoing and completed development activities, land use changes and scarcity of arable land within the Lake *Tana* development corridor threaten the ecological integrity and functioning of the highly dynamic wetland ecosystem. Yet, crop intensification (cultivation of rice at the cost of wetlands), retreat farming around the lake shore, unplanned or unsustainable lake shore investment and enclosure of the 'commons' are threatening the remaining wetland resources.

Based on the evidence of this research , national and international studies, coupled with global climate change and environmental degradation, there is speculation that Lake *Tana* could shrink drastically in size within four or five decades. Then the system may no longer be able to support life and will have an adverse impact on the livelihood of the local people, which ultimately affects the country's drive towards achieving sustainable development. Threats to Lake *Tana* and its sub-basin area will also have serious implications for environmental and human security in Ethiopia and other downstream riparian communities (Egypt and Sudan).

7.3.2 The politico-economic context and discourse

The concern for environment in Ethiopia has undergone many stages and continuously evolved over the centuries. The use-oriented period represents the main features of legislations, which were led by human needs and capacity to exploit natural resources. While the resource-oriented period was more focused on the management of natural resources and recognized the fact that such natural resources could be depleted. The eco-system-oriented legislations, however, are characterized by a holistic and integrative approach, which is focusing on the complementarily of society's development needs and that of ecological balance (Hailu, 2000). The concept of sustainable development and environmental rights are well-established in the Rights of Peoples in Ethiopia through Articles 43 and 44 of the FDRE constitution. As a result, the Environmental Policy of Ethiopia was issued in 1997 to provide overall guidance in the conservation and sustainable utilization of the country's environmental resources in general.

The politico-economic context is examined under a dynamic perspective to understand how power has been distributed among actors who take decisions and how political and economic interests have driven actors' decisions in the process of CPR use, management and governance in the sub-basin. As discussed in Chapter 5 section 5.4.4, stakeholder's power to take action and secure the outcomes could be vested politically or as a result of their social/financial capital. In Ethiopian context however, all powers related to natural resource management and governance is vested by FDRE constitution. Accordingly, all the powers and responsibilities to administer and govern all land based natural resources are vested to the Federal and Regional governments where the lions share goes to the Federal government and its line ministries and subsidiary administrative bodies at different level.

For instance, at Federal level major responsibilities for the protection of the environment in Ethiopia are vested on the Environmental Protection Authority (EPA). There are also other organs of the government with one or more responsibilities relevant to the protection and management of environment and natural resources. EPA is responsible to coordinate actions of other sectoral governmental bodies to ensure the implementation of basic environmental rights provided under the 1995 FDRE constitution and principles set out in the environmental policy of the country.

Even among the government hierarchy the power to control and administer land and land based resources are determined by the social and political capital of the individuals who lead the organization. Their political attachment to a very influential person in the political system helped them to exercise their power to control and administer resources. This politico-economic structure affects local rules-in-use and local people's decisions on environment in general, common pool resource use, management and governance in particular.

More recently there has emerged a worldwide consensus that the environmental and ecological concerns represent one of the most critical factors related to socioeconomic development. The environmental discourse has gained increasing attention in almost all international forums on development, and the environment-development relationship is being seriously taken into account in practical policies and theoretical debates (Haque, 2000). Particularly policy intervention in CPR use, management and governance appears to be a messy process which involves a complex discourses and series of interactions between the decision makers, producers and users of research. As clearly indicated by Adams *et al*. (2002) the definition of the policy 'problem' for key stakeholders may be contested and can be a source of conflict among stakeholders. What may be seen as a critical 'problem' by one group of resource users (such as official perceptions about the 'illegal' use of state forests for fuel wood by local villagers) may be interpreted by other stakeholders (such as non-governmental organizations and advocacy groups working with such villagers) as a basic need or an inalienable right.

With regard to the issue of environmental management and protection in Ethiopia, government institutions and departments at different levels responsible for different aspects of the natural and human environment carried out their duties. This had led to fragmentation of environmental protection activities consequently to serious deterioration and damage to the environment. This is because the said government institutions were responsible for both sectoral development and environmental protection, which is inherently conflicting and source of discourse among stakeholders (Hailu, 2000).

On the other hand, the problems of natural resource management and governance as perceived by government planners, policy makers, and researchers are quite different from the problems of primary concern to the users (community members) who are trying to secure access to sustainable livelihood options by optimizing the use of their CPRs. This is because decision makers, researchers and users inhabit different worlds (Caplan, 1979). They all act in pursuit of their own experience and contexts. While researchers may revere theories and concepts, decision makers want concrete evidence which is relevant and easy to understand; while researchers often take years to complete research studies, decision makers want answers quickly (Mitton *et al*. 2007). Each side also speaks its own, highly technical language (Choi *et al*. 2005). As discussed in the following sub-sections this discourse usually manifested in conflicting interests of actors in the action arena (for more details see Table 7.1).

7.3.3 Patterns of conflicting interaction among stakeholders

There is no internationally accepted definition of what constitutes a natural resource conflict (Upreti, 2002). Yet, sharp differences in power and in stake values across interested stakeholders make conflict inherent in CPR management and governance. So far, long-term maintenance of ecosystem health is in conflict with the short-term interests of many stakeholders and policymakers (Dietz *et al*. 2003; Bavinck *et al.* 2005). Although conflict is a feature of many resource management regimes, it is often assumed to reflect differences in material interests between stakeholders (Adams *et al.* 2003). As Upreti (2002) defined, conflict in this research however, could refer to observable differences in opinion, misunderstandings, clashes of interest, disagreements, complaints in public, and protests by arguments and physical assault, antipathy filing cases with the local administration, police and courts related to CPRs (with a particular emphasis on water, fish and wetlands).

As these commons evolve and are used for different purposes by different stakeholders and are governed under different management regimes, externalities such as competition, resource degradation and conflict amongst user groups are inevitable (Edwards and Steins, 1999). In handling stakeholder interest over CPRs, it is exceptional that 'win-win' governance solutions can be found in key decisions that affect resource management and governance. Usually the decisions may not meet the needs and interests of every stakeholder and most decisions will end-up with 'win-loss' situations and in most cases, 'the win-loss' situation is against the interests of the poor and voiceless.

The different stakeholders involved in the joint uses may act in the pursuit of various goals and private interests (e.g. commercial use, the strategic stance of a national and local authority) and choose their actions in order to satisfy those interests efficiently or the general public interest (e.g. Government and NGO with an objective of environmental concern). Furthermore, stakeholders can pursue local (within the boundary of the resource), regional, national or even global use interests (Knight, 1992; Gerber *et al*. 2009).

In most cases, the combination of environmental and demographic change, developmental and market pressures, multiple often divergent interests of different stakeholders that lead to natural resource competition and force local people to alter their livelihood strategies, are considered as the underlying causes for resource competition, both among community members, and between community groups and outside public and private organizations which ultimately leads to conflict (Warner 2000; Engel and Korf, 2005). Increased competition and demand for natural resources of all kinds is in turn leading to increased conflicts generated by overlapping resource claims between local users, large-scale resource users (private investors) and government officials (Darby, 2010). In some cases natural resource conflict could arise due to failure in governance (institutions, policies, laws) to resolve these tensions equitably that leads to specific groups being disadvantaged, and ultimately to conflict (Matthew *et al*. 2009).

Common-pool resource conflict may arise at international, regional, national and local level. The causes and nature of conflict also depend on knowledge, perspective and context of stakeholders involved in CPR management and governance at these levels. However for this research, CPR conflict analysis focused on national/regional (higher level) and local level resource users conflicts with a special emphasis on resource users. The conflict situations in the sub-basin further illustrate how multiple actors influence pattern of interactions and outcomes. The following sub-sections answer the question of why do conflicts/disputes arise among stakeholders, and what are the underlying causes of conflict and resolution mechanisms. The common patterns of interactions in CPR conflict and conflict resolution mechanisms across communities and at higher level of governance are examined.

7.3.3.1 Higher level conflict (Macro and Meso level)

At higher management and governance level, there is a trade-off between environmental conservation and development policies. Conflict between natural resource conservation interests and utilization of natural resources for development activities is increasing among stakeholders. This trend is likely to continue as population and market pressure and demand for CPRs are increasing. Therefore policy makers dispute over devising appropriate policies

for effective natural resource utilization, management and governance. Policy conflict arises because of differences in knowledge and understanding between how stakeholders frame their perceptions of resource use problems as well as possible solutions to these problems (Adams *et al*. 2003).

Law and policy makers, ministries and executive governmental agencies at the constitutional and collective level who are mainly involved in the formulation, implementation, monitoring and evaluation of natural resource management and governance are mostly confronted with conflicting objectives. Documentary analysis and key informant discussion results show that Environmental Protection Authority (EPA), Institute of Biodiversity Conservation and Research (IBCR), and Ethiopian Wild Life Development and Conservation Authority (EWDCA) with conservation and protective goals are striving to minimize the stress on Lake *Tana* ecosystem through proposing the delineation of buffer zones up to 5 km around the shore of the Lake and implementing integrated watershed management approaches in the sub-basin. Particularly, the EPA and its regional office are striving to protect the health of Lake *Tana*'s environment from natural and human induced calamity, mainly from government led development endeavors and private investments.

On the contrary, Ministry of Agriculture (MoA) with a broad objective of boosting production and marketing for food security, is trying to insist that farmers in Lake *Tana* sub-basin use improved agricultural technological packages and encourages double cropping using available water including draining wetlands. Particularly the office encourages the farming community to use fertilizers and pesticides without noticing, or ignoring, the potential pollution and adverse impact on Lake *Tana* ecosystem. On the other hand, Ministry of Water and Energy (MoWE) and Ethiopian Electric Power Corporation (EEPCo) are withdrawing water from the Lake for hydropower and irrigation purposes. Construction of irrigation dams at the major tributary rivers which could have a tremendous impact on the Lake *Tana* ecosystem and water level for navigation, are underway (see Chapter 4 section 4.2 Figure 4.1 and Table 4.1).

In principle MoWE, with the mandate of executing water resource policies and strategies, has to strive to ensure that the control of environmental health hazards be a necessary condition in the design, construction and use of dams and irrigation systems in Lake *Tana* Growth Corridor. Therefore, MoWE has to recognize that natural ecosystems, particularly wetlands and upstream forests, are fundamental in regulating water quality and quantity and to integrate their rehabilitation and protection into the conservation, development and management of water resources. However, in practice the ministry and its line structures are only focused on water resource components of the broader Lake *Tana* ecosystem without considering other subsystems (for instance fish and wetlands).

The Investment Bureau and *Bahir Dar* City municipality are also engaged in leasing wetlands around Lake *Tana* shore for private investors. Although they all claimed that development activities are based on Environmental Impact Assessment (EIA) reports, the reality is EIA was conducted just to fulfill the formality and it is often in favor of the government initiated development objectives and private investments rather than on environmental concerns and local community interests. All are in conflict with the environmental issues of the lake ecosystem where the Environmental Protection Authority (EPA) and other concerned bodies are responsible to monitor and control.

These agencies have their own knowledge perspective, power and mandate to see and act accordingly towards managing and governing the Lake *Tana* ecosystem. Government officials are typically unaware themselves of the conflicts and confusion caused by the contradictory goals, regulations, procedures, and plans of their various agencies to manage natural resources. If they are aware of the conflicting interest, they will act on their own pursuit rather than negotiating with other party or parties.

According to Grimble and Wellard (1997), conflicts can be categorized in terms of whether they occur at the micro-micro or in the micro-macro levels, i.e. among community groups or between community groups and government, private or civil society organizations. Cornroy *et al*. (1998) further categorized Micro-micro conflicts as taking place either within the group directly involved in a particular resource management regime (e.g. a forest user group

or ecotourism association), or between this group and those not directly involved. Macro-macro conflicts may occur between different stakeholders at national level and between stakeholders at national and international levels. There may be policy differences between two government ministries over the scale and extent of permitted resource exploitation and incompatible international and national concerns. Micro-macro conflicts arise where the actions of local stakeholders conflict with those of macro-level stakeholders who may or may not represent the interests of wider society (Grimble and Wellard, 1997).

However, as can be seen from Table 7.1, sometimes macro-micro classification of conflict might not be the only situation where conflict arises. For instance conflict could happen at micro-meso interface where user community and/or local administration are in conflict with the Regional and/or Federal level governmental agencies. There are also situations whereby regional level governmental agencies make an argument with that of higher/Federal level authorities at the meso-macro interface.

Table 7.1 Conflict of interest among stakeholders in Lake Tana sub-basin

Level of conflict	Stakeholders involved	Causes of conflict	Dynamics of conflict	Conflict Management options
Micro-user level (within)	Fishers, Local Farmers, Local experts, administrators, women's group, Youth groups, Investors, Boat owners, Lake *Tana* Transport Enterprise, Ethiopian Electric Power Corporation etc.	Competition for scarce resource (fish and wetlands) to secure livelihood and/or make a profit, theft of properties (eg. net for fishing), unclear boundary of resource system, absence of or unclear rules and regulations to govern the resources etc.	Increasing trends (both in frequency and type)	Mainly negotiation between disputing parties, Mediation by neutral, independent person (traditional dispute resolution methods), courts as a last resort (formal method).
Micro-Meso interface (Between)	User community and/or local administration Vs Regional and/or Federal level governmental agencies	Incompatibility of livelihood and property rights security, not compensated for loss of land or other properties Vs Development and/or conservation goals of each agency	As development pressure on commons and leasing of communal lands for investors increases, the likelihood of conflict between the two parties will increase	Economic compensation, negotiation to convince the local community, in case of disagreement appealing to the higher level.
Meso-regional (within)	Regional Bureaus of (Agriculture, Environmental protection, Investment, Water resource), Municipalities etc.	Unclear mandate and responsibilities and duplication of efforts, multiple interest , lack of linkage and information flows, bypassing the mandates of others, uncoordinated planning and implementation	Unless there is revision of mandates and responsibilities, there will be an increasing trend of conflict among stakeholders	Policy review, stakeholder workshops.
Meso-Macro interface (Between)	Regional level governmental agencies Vs Higher/Federal level Authorities and ministries	Information and knowledge gap, overlapping mandate , Higher level Authorities sometimes bypass the mandates of regional states/Authorities	Rarely happened	Policy review, stakeholder workshops.
Macro-National (within)	Policymakers, Legislators, Ministry of (Agriculture, Water and Energy..), Institute of Biodiversity, International organizations (UNESCO, FAO)	The paradox of conservation verses development goals, policies imposed without local participation, uncoordinated policy planning and decision making	On the wake of climate change, there is an increasing trend environmental degradation and international pressure	National consensus, International treaties, agreements, conventions

Source: Own survey, stakeholder identification and Analysis workshop and group discussion results, 2011

7.3.3.2 User's level conflict (Micro level)

In general, all common-pool resource users at all levels are confronted with the problem of how to reduce or eliminate externalities related to resource governance and management (Agrawal, 2001). Conflicts over natural resources at the community level have many causes and occur in different forms and levels of severity. Usually local level conflicts arise between different on-site stakeholders, such as settled farmers and migrant livestock herders, or between on-site and off-site stakeholders. Such Micro or local level conflicts frequently originate from breakdowns in systems of common property management, under pressure from population growth, economic activity and sometimes the incursion by outside interests (Grimble and Wellard, 1997; Grimble, 1998). At user level conflict is usually derived by scarcity of resources, striving for securing livelihood, unclear property rights and resource boundary, new market opportunities which gives an incentive for the users to increase their efforts to harvest more. For this study however, conflicts at user level were categorized into three broad levels: Community-level conflicts (opposing individuals and groups within local resource user communities); intercommunity conflicts (neighboring villages, *kebeles* and districts); and supra community (local communities vs. Regional/Federal level formal institutions or other non-local stakeholders like private investors) (Sanginga and Martin, 2007).

Community level conflicts

At community level competition over declining CPRs has sparked internal conflicts between individuals, between groups, between individuals and groups. Community level conflicts over CPRs often start as local competition; if ignored or unresolved in a timely manner, such type of local CPR conflict often escalates with new stakeholders engaging and new topics being connected to it. In the worst case conflicts get politicized and become destructive and more violent. The effect of CPR conflict at community level can be tangible (like destruction of farms, burning houses and in worst cases physical assault or killing of the rival) or intangible such as mistrust among community members and in government officials.

Violent conflict has usually resulted from competition over agricultural and grazing lands. In recent times however, competition over wetlands has been recorded as a driving force behind the majority of local confrontations in Lake *Tana* sub-basin. Then again, CPR conflict is usually driven by scarcity of resources, livelihood security, unclear property rights and resource boundary (at *kebele* and/or district level), new market opportunities, unregulated resource use and inefficient rules to govern the resources which give an incentive for the users to increase their efforts to capture or harvest more resource units from the CPR system.

Intercommunity conflicts

Intercommunity conflicts are usually occurring between neighboring or bordering villages, *kebeles* and districts. In rare cases however, other community members from far distant *kebeles* and districts could be involved in conflict situations of the local community. Particularly during dry season, herders move their animals in search for feed and water. For example, during winter time when animal feed shortage becomes critical, farmers from the highlands and low lands of *Amhara* region who have relatives in Lake *Tana* border move their herds to *Fogera*, *Dembiya*, *Achefer* and *Libokemekem* districts so that they can stay for at least two months. As a result there are many clashes between the residents and the outsiders over the use of wetlands and grazing lands.

Unclear resource boundaries are the major sources of conflicts at intercommunity level whereas resource scarcity is another important source of conflict between neighboring villages, *kebeles* districts and beyond. The two case studies (see Box 3 and 4) demonstrate two intercommunity conflicts between bordering districts and *kebeles* respectively.

Box3: District-District level conflict: **The *Libo-Fogera* conflict over *Ribb* River**

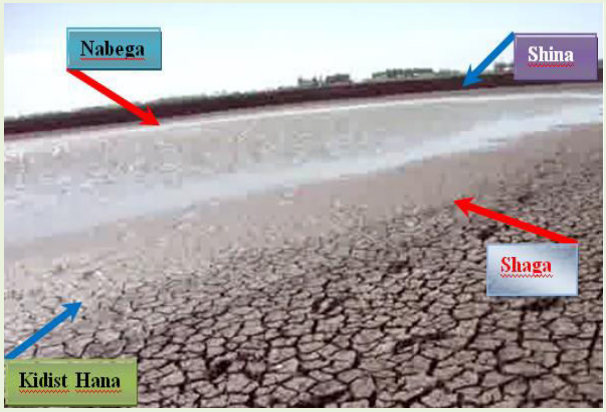
Ribb River is one of the major tributaries of Lake *Tana*. The river used to pass dividing both district and finally reach Lake Tana. Farmers residing in both districts were used to cultivating around the river bank of *Ribb*. By using water pumps, they used to irrigate their farms from the river. Through time, the course of the river has changed from its century old route that divides the two districts towards the *Libokemkem* district leaving *Fogera* behind. The causes of the route change might be a natural phenomenon; however, farmers in *Fogera* district are pointing their fingers towards their counter parts (*Libokemekem* farmers). They assumed that there was clearly a human intervention to change the direction of the river. In due course, this farmer to farmer conflict near to the river escalated into *kebele* to *kebele*, and then to district to district level conflict that involves officials and experts in both districts. This dispute was unresolved at the time when this study was conducted. However, recently construction of an irrigation dam has been carried out and *Ribb* River is going to be blocked at the upstream level. This might at least loosen the tension between the rival farmers of each district.

Source: Author, 2012

Box4: Conflict within *kebeles* and between *kebeles*: The '*shesher*' wetland

Shesher wetland is found on the Eastern side of Lake *Tana* in *Fogera* plain at coordinates of $11^{0}56'21''$N and 37^{0} $37'6''$E and bordered by four *kebele* administrations. The wetland is a natural pond maintained by overflow of *Ribb* River during rainy season. It is one of the hotspots in Ethiopia which are considered as important bird areas. Community members in each *kebele* benefits from the wetland in the form of fishing for both household consumption and local market, grazing for cattle and small scale irrigation. Currently, this valuable wetland is under threat from overgrazing, drainage, water diversions for small irrigation and conversion into farmlands (Atnafu *et al*. 2011) and becomes one of the conflicting spots in the district. During dry season farmers from these four *kebeles* (namely *Nabega*-from West, *Shaga*- from East, *Shina*- from North, and *Kidisthana*- from South) who owned land adjoining the wetland follow the water retreat and cultivate until the land dries up completely. Even though there are no legal demarcations allotted to each farmer to follow the retreat water, individuals put their own arbitrary demarcation (Picture 'a') along the street side of their plot. Most often the 'first-to plough, first-to hold' is applied to be entitled to hold use right. Then conflict of demarcation within each *kebele* will continue as the water retreats further. As every farmer from each *kebele* converges into the center (Picture 'b') of the *sheher* wetland, disputes and conflict increase to transcend from farmer-to-farmer within *kebeles,* to *kebele*-to-*kebele* conflict. Sometimes these conflicts escalate to involve many actors like *kebele* administrators, local experts and become fully fledged conflict that ultimately involves district officials and leads to district level courts.





a) Stick and rope used as a demarcation *b)Cultivated wetland converged to the center*

Source: Author, 2012

Supra community conflicts

Supra community conflicts usually happen when the interests of Regional/Federal level formal institutions and private investors stand against the will and wellbeing of local communities, particularly when it contradicts their collective interest and they were not convinced enough. In most cases development goals of the government and private investors are challenged by the local community interests (like keeping and preserving the wetlands). In such cases, conflict of interests between the local community and outsiders will be inevitable. Unless they are convinced, community members will resist any development activities in their CPRs.

However, the issue of conserving the 'commons' has become politicized and some of the community members behind the scene, who had little sense of belonging and awareness of any need to preserve and conserve their CPRs, were considered as 'those who are addicted with the status quo', even some of the district officials considered them as 'anti-development'. As a result, local community members could not resist further keeping their commons from outsiders. Low participation of the local community in the planning and decision making process of development projects, environmental and conservation programs were considered as the main causes of supra community conflicts in the study area.

7.3.3.3 The causes and dynamics of CPR conflict

Conflict is an inescapable aspect of the CPR management and governance system. Due to multi-stakeholder interaction and diverse power over and interest in CPRs, the dynamics of conflict in Lake *Tana* sub-basin are complex. Therefore, understanding the nature, complexities and dynamics of conflict at local level will help to devise effective policy and conflict resolution mechanisms.

The household survey and focus group discussions' result shows that the causes and nature of resource conflict in the study area are diverse in different localities; however, unclear property rights, unclear boundaries between land use (farm land, grazing land and wetland) and bordering *kebeles* and/or districts), scarcity of resources, multiple interest of users and poor resource governance were mentioned as the major causes of conflict over CPRs.

Focus group discussion with CPR users also confirmed that scarcity of resources, unclear property rights and unclear boundaries (between land use and bordering *kebeles* and/or districts) ranked 1st, 2nd and 3rd respectively as the main causes of CPR conflict in the study area. From the survey results, 28%, 22% and 21% of respondents mentioned unclear property rights, unclear resource boundaries and scarcity of resources respectively as the major causes of CPR conflicts in their localities (see Table 7.2). The nature of resource scarcity (whether it is demand driven or structural scarcity e.g. due to distribution problem) and the nature of the resources under dispute are an important factor shaping the dynamics of a given conflict. The nature and number of parties to a conflict also has a direct bearing on the dynamics of the conflict and its potential for resolution (Ayling *et al.* 1997).

Table 7.2: Nature and causes of CPR conflicts as perceived and prioritized by users

Nature and Causes of Conflict	**(n=200)**		**Focus Group Discussion Rank**
	Frequency	**%**	
Unclear property rights	56	28.0	2nd
Unclear boundaries	44	22.0	3rd
Scarcity of resource and competition	42	21.0	1st
Poor resource governance	18	9.0	4th
Multiple interest of stakeholders/users	11	5.5	5th
All are potential sources of conflict	29	14.5	-

Source: Own Survey result and focus group discussion, 2011

Hence, this study confirms that conflict over CPRs particularly water, wetlands and grazing lands were more prevalent than fish resource conflict and dispute. This is because of:

- The easily accessible and fixed nature of wetlands and grazing lands as compared to the mobile and inaccessible nature of fish resources.

- The demand for water, wetland and grazing lands is increasing from time to time and involved many stakeholders with diverse interests.

Usually, due to unclear boundaries between individual farms and CPRs (grazing lands, lakeshore wetlands and seasonal/permanent ponds like *shesher* and *Welela*) neighboring farmers were tempted to stretch their farms little by little into the commons. Although it reinforced a sense of insecurity among the farming communities, the 1997 land redistribution which took place in *Amhara* region clearly identified and delineated CPRs (such as forest land, grazing land and wetlands) and no one was allowed to use these resources privately.

In 2005, with the objective of improving tenure security, registration of land holdings and granting land use certificates to holders was undertaken. In due course, communal lands, forest and grazing areas were also supposed to be delineated, registered and certified. However, during the registration process, many cases of illegal encroachment into wetlands, common grazing fields, forest and marginal areas were disclosed. Even though the law states that such illegally held plots will be taken away and given to landless people or returned to the commons, those cultivating these encroachments oppose such decisions (Berhanu and Fayera, 2005).

According to focus group discussion participants most of the land registration and certification activities around Lake *Tana* (particularly in *Fogera* and *Libokemekem* districts) were suspended for quite some time. In due course, most of the greedy and corrupted *kebele* officials who have land holding adjacent to the common pools included and registered communal lands and wetlands into their holding through illegal land grabbing. As a result the most powerful groups (wealthy and/or politically motivated individuals) owned common wetlands illegally with legal land certificates. Since then private land holding and communal holding became a source of conflict.

According to key informants, police and militia reports, CPR conflicts between members of local community have become increasingly common in each *kebele* and district. The majority of legal cases examined in each district court were either land or other natural resource related disputes typically wetland and grazing land. More than 78 % of the respondents mentioned that resource conflicts are more prevalent than earlier (two or three decades), and with advent of population pressure, resource scarcity and other socioeconomic factors, conflict over CPRs will likely increase in the coming decades as well. The majority (70%) of the respondents mentioned that over the last 10 years conflict had been occurring more frequently whenever resource users are coming together to use their CPRs (see Table 7.3).

Table 7.3: The prevalence of conflict over CPR in Lake *Tana* sub-basin

Items	Response	Frequency (n=200)	Percentage
Were conflicts over CPR more prevalent in the past 10 years?	Yes	157	78.5
	No	43	21.5
How frequently has conflict among resource users arisen?	Always	140	70.0
	Seldom	53	26.5
	Never happened	3	1.5
	I don't know	4	2.0

Source: own survey result, 2011

7.3.3.4 CPR conflict management and resolution mechanisms

Conflict is inevitable, and has steadily increased, but so too has human effort to explain and manage it (Bartos and Wehr, 2002). Conflict has to be managed and resolved as early as possible, otherwise, if it escalates and involves many stakeholders it is difficult to manage. As mentioned by Scheffran (2006), stakeholders can negotiate to find a solution to the conflict themselves through negotiation and discussion between two parties working toward reaching agreement without assistance, or with the help of a mediator. Mediation is a voluntary part of the negotiation process which aims for a common ground, with a neutral, independent person or groups who monitors and manages the process and assists the disputing parties to reach a mutually beneficial agreement. Arbitration is one of the conflict resolution mechanisms where disputing parties resolved their argument using an independent

third party. In this case, the third party determines a binding settlement. Stakeholders can also use the formal means of conflict resolution methods by using the justice system with judge and/or jury.

In the study area, selection of the conflict management approaches depends on the extent to which the conflict situation is escalated and at what level (local and higher) conflict has risen. If it is simple, not difficult to handle and occurred at a very local level (example; within villages, and/or *kebeles)*, both conflicting parties may find a solution by themselves through negotiation or using traditional approaches mediated by a third party. However, if conflicts are complicated and lead to violence, multiple stakeholders such as *kebele* militia, local administrators, experts, police, and district administrators will be involved and the cases could be directed to arbitration or the formal justice system. Higher level CPR conflicts usually comprise incompatibility of conservation and development goals and overlapping mandates and responsibilities among relevant stakeholders. These types of conflicts are resolved through policy revision, stakeholder workshops to negotiate over the situation and to reach a national and regional consensus. However, this is done very rarely as an ad-hoc measure and does not involve lower level stakeholders.

At community level a range of traditional or non-formal methods were used to manage or solve CPR related conflict. Traditionally community members used to manage conflicts by devising local level customary laws and courts. As reported by Pankhurst and Getachew (2008), most of the customary institutions of conflict resolution in the study area take place on an ad hoc basis. They were usually assigned as conflict erupted, dispute and tensions over resources increased. Traditional institutions of conflict resolution play a very significant role in the day-to-day lives of rural people in the study area and elsewhere in Ethiopia. They serve as alternative institutions of conflict resolution in a country where the formal legal system is failing to fully meet the judiciary needs of the nation (Zeleke, 2010).

In the study area mostly known traditional CPR conflict management and resolution mechanisms or institutions are called '*Ye giligil shimgilina'* and *'Dem Adirk' or Ye dem Irk*). The judges or the arbiters are called *'shimagiles'*. These are customary approaches designed by the community for the community. Then again, terminologies of these traditional forms of out-of-court dispute resolution mechanisms are still blurred in the eyes of formal justice system and different people use a variety of terminologies in different localities. However, in almost all the Amharic versions of legal texts in Ethiopia (such as civil, commercial and family codes and proclamations) the English term arbitration is translated as either '*Yezemed dangninet'*, or '*Shimglina'*, or '*Giligil'* or less frequently, *Irq* (Fekadu, 2009). After a critical analysis of the alternative words, Fekadu (2009) concludes that, although none of these words hit the nail on its head with due precision, '*giligil dangninet*' seems to be preferable for it has gained better acceptance among the legal community, and owing to its wider use in recent legislations.

'*Ye giligil dagninet'* or *'shimgilina'*-'*የግልግል ዳኝነት ወይም ሽምግልና*'

*'Shimglina'***,** which literally means elderliness, is the most rooted system in the Ethiopian traditional dispute resolution scheme. It is a practice that combines a hybrid of what a modern lawyer calls mediation, conciliation, compromise and arbitration proper (Fekadu, 2009). The judges or the mediators are called '*Shimageles*'. These are elder's council called '*Ye giligil Shimagiles*' who are playing key roles in solving minor disputes and bringing more serious ones to formal social courts. The members of the 'ye *giligil shimagiles*' comprise well respected elders of the community. Being elder by itself may not be considered as criterion to be selected as a '*ye giligil shimagilies*', rather they have to be well respected and recognized by the community members. Elderly doesn't merely signify age; it rather refers to the wisdom and social status of a person as valued by the community in question including, of course age and experience (Fekadu, 2009). They are autonomous in their decision. Both conflicting parties respect and accept any decision made by the elders.

'Dem adirk'/' ye Dem irk' shimgilina-'የደም ዕርቅ ሽምግልና'

According to key informants (both district experts and community elders), land based resource conflicts, particularly conflict over farm land, wetland and grazing land, are common in the study area. The worst case in these conflicting situations is when conflict becomes fully fledged violence and claims human life. *'Dem Adirk'* or *'ye dem irk'* is a traditional way of conflict resolution method where respected community elders were selected to handle severe conflicts like physical assault and death among individuals and groups. Sometimes religious leaders could be included as a member of '*Dem adirk'*. These are usually applied when the conflicting situation has escalated and took some one's life to death. This is just to protect family members of the offender against the revenge by the victim's family member. Usually, the offender will be judged by the formal court as per the Ethiopian penal Code and other rules. However, the offender's family members and relatives will send those elders (*Dem adirk*) to the victim's family for apology and compensation.

The key informants further argued that, in recent time however, these traditional (non-formal) conflict management and resolution methods have been weakened by distrust among community members and insufficient support from local government. They strongly believe that government's decentralization program that ignores the local contexts affects the informal institutions. Formal legal reforms have essentially destroyed or paralyzed many of these traditional conflict resolution methods such that due to growing population pressure and mistrust among community members they often prefer the formal methods of conflict resolution and management. Most people have sought to settle disputes by directing cases to the local courts rather than relying on traditional conflict resolution mechanisms, but still local people were not happy with the formal courts. Cases were resolved very slowly, sometimes taking more than a year and judgments were implicitly biased towards the better-off groups, politically affiliated or connected personalities and those who can afford to give '*Gubbo*[18]' to higher officials including judges and police.

[18] '*Gubbo*'-is a local Amharic term to mean 'a gift for someone, in exchange for doing something special' equivalent to English word' corruption' or 'bribery'

7.4 Evaluation of the outcomes of the governance interaction

7.4.1 Introduction

When we analyze and evaluate outcomes of the governance interaction, we are really analyzing the performance of the natural resource management and governance system. Hence, we need some kind of objective standard or principle for comparison (Polski and Ostrom, 1999). Performance reflects the outcomes produced by the patterns of interactions of different actors responsible for common pool resource use, management and governance in terms of benefits, participation in key decision making processes.

SWOT analysis is used to assess the overall governance interaction in the sub-basin. The data sources for SWOT analysis are mainly drawn from stakeholder analysis workshop participants and a series of focus group discussions across the sampled districts. During the interactive workshop and focus group discussions, participants were asked to identify internal factors (the strengths and weaknesses) of the overall CPR governance system and explore the external factors (opportunities and threats) that affect the governance system. Therefore the outcomes of the governance interaction was evaluated based on internal and external factors affecting the governance system, organizational capacity of actors, central and local governance linkage, rulemaking and enforcement process and the application of procedural principles and values of the governance system. As seen from Table 7.4, the results of the SWOT analysis help to see the reality of the CPR governance system in Lake *Tana* sub-basin. The analysis highlights the possibilities for innovative efforts or solutions to problems. It will also give a list of action points for intervention.

Table 7.4: SWOT matrix of the CPR management and governance system

STRENGTHS	**WEAKNESSES**
• Sound environmental policy framework at Federal/Constitutional level • Availability of governance structure (from Federal to *kebele* level) • Increasing environmental knowledge and awareness of stakeholders	• Lack of effective, timely rule making and enforcement mechanisms • Lack of directives and guidelines to enforce the existing laws on resource and environmental governance • Poor horizontal and vertical linkage among stakeholders • Poor grassroots level stakeholder participation (eg. Local community) in policy planning, law and decision making process • Bypassing the mandates of stakeholders • Overlapping mandates between stakeholders • Poor organizational capacity and environmental management skills of stakeholders • Inadequate stakeholder culture and commitment • Lack of multi-stakeholder interaction forums at grassroots level to dialogue over CPR management and governance • Lack of incentive for resource users (community groups and private investors) to prevent environmental degradation and CPR exploitation
OPPORTUNITIES	**THREATS**
• Emergence of international and national level multi-stakeholder forums/initiatives (eg. like Nile Basin Initiative) • Growing public concern over environmental issues • The presence of proclamations and regulations at constitutional level to protect the environment	• Frequent organizational structural changes and staff turnover • Multi-dimensional and often divergent interests of stakeholders over CPRs • High resource demand driven by high population pressure and absence of binding rules • Escalating conflict over resources

Source: Stakeholder Identification and analysis workshop and group discussion (2011)

7.4.2 Organizational capacity of actors in the action arena

Organizational capacity has been defined here as 'a set of attributes that help or enable an organization to fulfill its missions' (Eisinger, 2002). Attributes commonly associated with high organizational capacity are governance and leadership, mission, vision, and strategy; common values, program and strategic relationships; resource development; internal operations and management. In addition, for effective organizational capacity, networking, political power, skill of leaders, trust and unity among stakeholders within the organization are essential parameters. These interdependent factors all contribute to high performance of the organization to fulfill its missions. On the other hand, institutional instability is best understood as a pattern in which, given a common environment (i.e., exogenous shocks like changes in power), a particular institutional arrangement changes with greater frequency than other similarly designed ones (Levitsky, 2009).

The SWOT analysis (Table 7.4) confirms that most key stakeholders (particularly formal organizations) in the study area who are involved in resource management and governance are characterized by lack of organizational capacity and institutional instability. According to workshop participants, institutional instability caused by frequent changes in organizational structures is one of the crucial factors that negatively affect the CPR management and governance system. Due to these changes, personnel find themselves working for agencies or jobs for which they are not properly qualified. Instability of the institutional structure creates a dynamics of power shift in decision making on CPR management and governance from one key stakeholder to another. Institutional instability in terms of the incongruence between formal rules and informal norms also affects CPR management and governance.

The documentary analysis of proclamations and regulations shows that frequent and often unplanned organizational re-structuring and institutional changes are quite common in Ethiopia particularly at ministry level. For instance, initially the FDRE Proclamation No. 4/1995 that defined the powers and duties of the executive organs established 15 ministries. After 10 years, Proclamation No. 471/2005 that repealed the previous proclamation re-

structured the executive organs and 20 ministries were approved. Again after 5 years proclamation No. 471/2005 was repealed by proclamation No. 691/2010 and almost all (except 5 ministries that remain untouched) executive organs and ministries were merged, re-structured and re-organized with different and/or additional mandates. This implies that in the past 15 years, different ministries were separated, merged and/or dissolved to redefined mandates and responsibilities. In due course, institutional arrangements are changed and revised overtime.

As reported by Vaughan (2004), regular separation, reemerging, and re-separation of ministries and sector offices like those dealing with agriculture, natural resource management, and environmental protection has occurred. As a result, institutional instability impinges on institutional capacity and development. This is characterized by overlapping mandates and responsibilities of agencies, as well as frequent changes in mandates. A typical example here is the Ministry of Agriculture which has been changing its structure for the last 3 or 4 decades. Even very recently, it has been changed from Ministry of Agriculture and Rural Development (MoARD) and retains its former name Ministry of Agriculture (MoA).

Frequent changes and often unplanned organizational re-structuring become detrimental to the attainment of the mission and goals of individual organizations and disruptive to the sustainability of linkages, collaborations and coordination of institutions among different stakeholders. With the advent of very dynamic organizational and institutional changes, it becomes hard to monitor the roles, responsibilities, and accountability of stakeholders in the process of CPR management and governance. Based on these assumptions it was hypothesized that stakeholders are characterized by a weak organizational capacity and institutional stability to effectively manage and govern CPRs in the study area.

Therefore following the power and interest level analysis, workshop participants identified 8 criteria to evaluate the organizational capacity of the most dominant and influential stakeholders of Lake *Tana* CPR management and governance. After a brainstorming session two prominent stakeholders were selected and evaluated by the participants as important

cases. As mentioned in chapter 5 (Table 5.8) of this research, BoA and Bo-EPLUA are considered as two of the influential stakeholders with the highest power and interest level who have the potential to exert a substantial impact on CPR management and governance. Therefore the strength and organizational capacity of these stakeholders were evaluated using spider diagrams.

The spider diagrams (Figures 7.1 and 7.2) help to analyze and provide a visual summary of institutional capacity of selected key players of CPR management and governance at the regional level. The tool assesses the organizational capacity of stakeholders based on; a) technical competency of experts to execute policies and enforce proclamations, rules and regulations; b) client focused planning and decision making; c) linkage and collaboration with other relevant stakeholders; d) stakeholder participation and engagement in planning, policy and law making processes; e) transparency and accountability in natural resource management and governance; f) environmental concern and understanding of the CPRs context; g) knowledge and values integration with other stakeholders; and h) leadership and commitment. The spider diagram illustrates the level of strengths as well as the overall balance of the organizational capacity of key stakeholders in CPR management and governance. The tool also helps to identify key areas of improvements in the organization.

Figure (7.1) indicates that Bureau of Agriculture (BoA) has critical shortcomings in almost all criteria listed above. Concerning Lake *Tana* and its surrounding wetlands, BoA has a very low environmental concern and understanding of the CPR context. Regardless of the broader natural resource conservation strategies that took place at the upstream of the Lake *Tana* watersheds, BoA was not able to play its pivotal role as supposed to protect the Lake ecosystem.

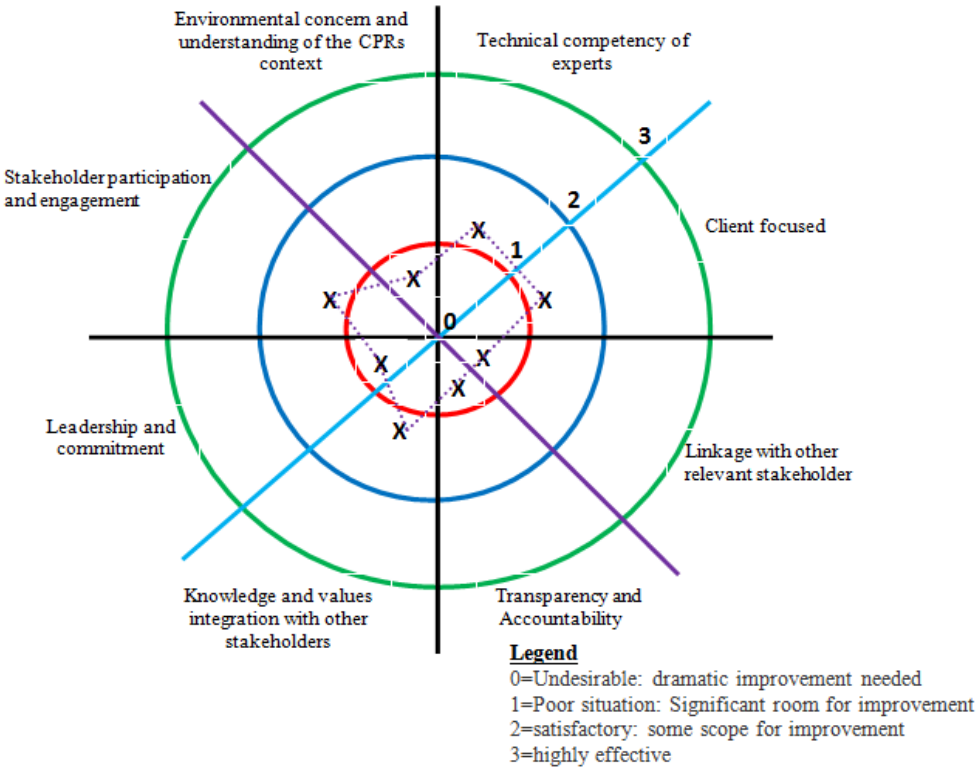


Figure 7.1: Spider diagram of organizational capacity- Bureau of Agriculture (BoA)
Source: Stakeholder Identification and analysis workshop, 2011

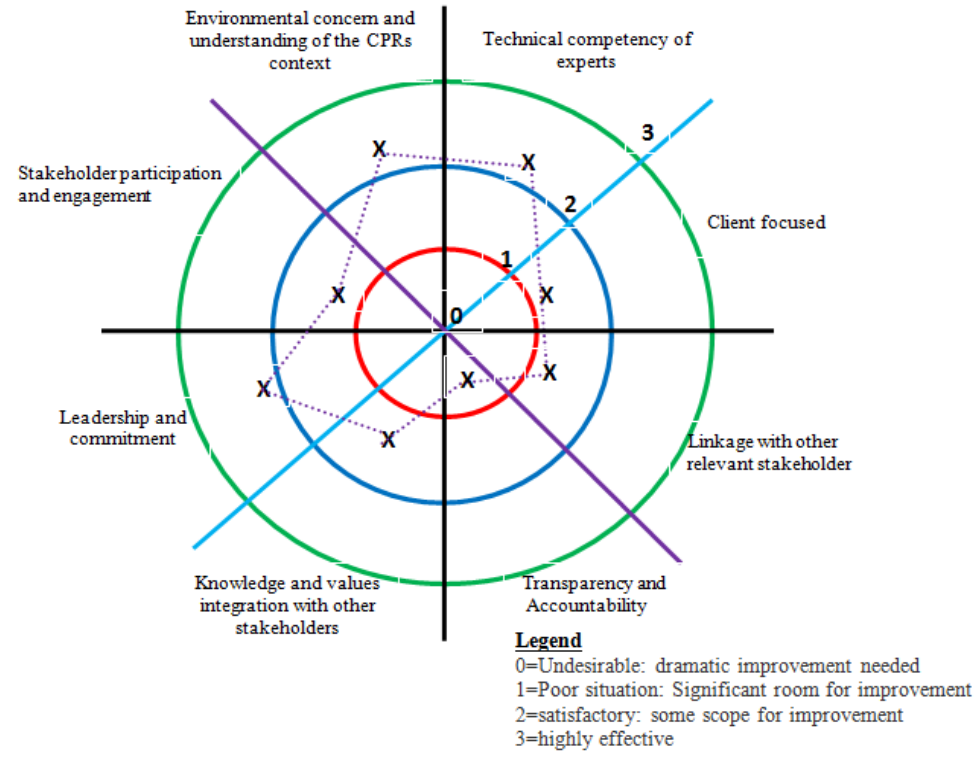


Figure 7.2: Spider diagram of organizational capacity- (Bo-EPLUA)
Source: Stakeholder Identification and analysis workshop, 2011

The Ministry at the Federal level vested powers and duties to devise and facilitate the implementation of a strategy for natural resources protection through sustained agricultural development (Proclamation No. 471/2005 Article 16/d and Proclamation No.691/2010 Article 19/1/e), whereas experts and local administrators encourage expansion of agricultural development, for example rice cultivation in *Fogera* and *Denbiya* plain at the expense of wetland ecosystems. This might be due to its ambitious mission and strategies for boosting agricultural production for food security as a priority agenda that compromises the sustainable production and conservation of natural resources particularly common-pool resources.

Despite its organizational structure that spans from the Federal to *kebele* level, BoA has weak knowledge and value integration with other relevant stakeholders. Natural resource development planning and decision making processes are characterized by a top down approach where stakeholder participation and engagement were very minimal. As a result policies, strategies, rules and regulations that were enacted at the constitutional level were not transparent enough to the local community including grassroots level experts. It is not client focused but rather serves the interest of higher officials. Notably, technical competency of district experts and Development Agents (DAs), awareness and commitment of senior managements and experts to implement natural resource policies and strategies, proclamations, rules and regulations need to be significantly improved.

Unlike the Bureau of Agriculture, Bureau of Environmental Protection Land Use and Administration (Bo-EPLUA) has relatively satisfactory technical competency of experts, environmental concern and understanding of CPR context, leadership and commitment (see Figure 7.2). However, the Bureau has a poor situation in terms of its relationship with other stakeholders and with its clients, knowledge and values integration, participation and engagement with other stakeholders. With regard to transparency and accountability, Bo-EPLUA has critical shortcomings. This suggests that the critical constraints of Bo-EPLUA capacity to address the CPRs problems and other related environmental issues are therefore related more to stakeholder participation, engagement, accountability and transparency than to either technical skills or basic management competencies.

A typical example here is the way in which decisions are reached in Environmental Impact Assessment (EIA) of projects and investment licenses around Lake *Tana* sub-basin. As noted by Sadler (1996), EIA decision-making requires striking a balance between economic, environmental, social and other criteria. Therefore it is a political process involving trade-offs between conservation and development goals rather than purely scientific undertakings. This trade-off process takes place largely behind 'closed doors' and is not transparent to the public. However, all decisions about natural resource governance priorities and investments should be accessible to all stakeholders who potentially are affected by the decision. Transparency is required in who has made a decision; the means by which it has been reached; and its justification (Lockwood *et al*. 2010).

Figure 7.3 illustrates two contrasting scenarios of investment and environmental protection activities around the southern tip of Lake *Tana* shore. The first scenario (picture 'a') depicts where wetland is protected by a group of users organized by Bo-EPLUA. Wetland users are benefiting from the wetland while they are protecting the resources from degradation. They had devised and use their own bylaws to manage and govern the wetland in a sustainable manner. Conversely, within one kilometer radius(picture 'b'), a wetland is subjected to destruction where private investors were allowed to fill the wetlands with gravels and changed wetlands into 'bare lands' whereby investors destroyed the flora and fauna of the ecosystem for construction of resorts, harbor and other recreational sites. This is the result of unintended outcomes of the investment policies in the region where environmental concerns have not been integrated into development activities.

With the mandate of ensuring the implementation of the regional land and environmental laws and policies, designing and implementing land registration program, drafting policy and legal instruments having to do with land administration and environmental protection, and establish systems for effective environmental impact assessment, Bo-EPLUA is directly or indirectly involved in both scenarios.

As discussed in chapter 6, section 6.2.3.3 of this research, Environmental Impact Assessment (EIA) Proclamation No. 299/2002, Article 3, sub article 1 and 3 states that:

> *'No person shall commence implementation of any project or development activities that require EIA. Any licensing agency (in this case, ANRS Investment Bureau and/or Bahir Dar City Municipality) shall, prior to issuing an investment permit or a trade or an operating license for any project; ensure that the Authority (EPA) or the relevant regional environmental agency (Bo-EPLUA) has authorized its implementation'.*

Therefore, had there been a clear and transparent decision making process among each units in Bo-EPLUA (for example EIA section and Land Use and Administration) and between other relevant stakeholders, there might not be such contradictory scenarios within one kilometer radius.



(a) (b)

Figure 7.3: Comparison of protected (a) and unprotected wetlands (b)
Location: *Near to Bahir Dar Fishery and Aquatic Life Research Center (BDFLARC)*
Source: The Author (2011)

Coupled with poor organizational capacity and institutional instability, very poor stakeholder coordination, linkage and lack of joint planning and implementation negatively affect CPR management and governance. Even if almost all executive organs established under the Ethiopian proclamation are obliged to cooperate with other concerned bodies, there were no multi-stakeholder interaction forums at collective choice and grassroots level to cooperate, negotiate and dialogue over CPR management and governance. Instead of making linkage

and collaboration, each stakeholder preferred to create its own jurisdictions and act based upon their own knowledge perspective. Stakeholders make choices and decisions based on their own preferences, objectives or mandates.

The documentary analysis of proclamations shows that with regard to administration and management of natural resources, there are sometimes ambiguities regarding power and responsibilities. Roles, responsibilities and accountabilities are not clearly defined leading to an overlap in the mandates of the key institutions and organizations managing and governing natural resources. While all stakeholders have the same overall goal of protecting the natural resources, they have very different knowledge, approaches and perspectives in terms of sustainable management and governance. Even they are operating in various contexts and institutional environment. This might create some confusion and conflict in resource management and governance at different levels.

7.4.3 Central-local incongruence: Central and local government linkage

Effective natural resource management and governance requires democratic and mutually supportive central and local governance institutions (Lockwood *et al*. 2010). The role of local institutions such as local government units (*kebele and* district administrations), both formal and informal local organizations like cooperatives, traditional and culture groups (*Mahber, senbete*, and *Edir)*, and NGOs, is becoming more important for successful CPR management and governance. Common-pool resource management and governance is a function of the formal and informal institutions that govern and oversee access to and withdrawal of the resource (Ostrom, 1990). These units facilitate knowledge exchange, information flow and enforcement of formal rules at grassroots level. However, as discussed in chapters 5 and 6, stakeholders involved in the governing system (the executive agencies at a collective and constitutional level) were not able to understand the local context where local level governing systems interact with the system to be governed at the operational level. There was also an inadequate understanding of how local communities shape not only the organizations and the resource management and governance outcomes at user level, but even the context and environment in which they operate.

Due to this incongruence, government technical agencies and local level governance structures have been ineffective in managing and governing CPRs; it seems they are neither able to replace many of the resource management and governance functions previously provided by indigenous cultural and communal institutions nor complement the informal institutions. There are concerns that some local institutional arrangements are breaking down due to a lack of support from local administrative structures, despite the process of decentralization, and this has major implications for the sustainable use of CPRs and food security throughout the region (Maconachie *et al*. 2008). The formal rule making and implementation process is characterized by lengthy, non-participatory and often poor political commitment of concerned governmental bodies to enforce the rules and regulations at different level (see Table 7.5 and Box 5). Local government units, formal and informal organizations were not consulted in policy planning and governance issues.

7.4.4 Rule making and enforcement process

Passing a new law or writing a new regulation is not the equivalent of establishing a new rule. Laws and regulations must be enforced at user level to become rules (Ostrom V. 1991; Hodgson and Calatrava, 2006). Once enacted, rules and regulations have to be enforced as early as possible to meet their intended objectives. And yet, to be effective they must be accepted as legitimate by resource users and complement their local bylaws and conventions. However, the documentary analysis of this research reveals that, in Ethiopia the process of rule making and enforcement of the rules is very lengthy.

Domestically, the national legal systems have no limitation to enact legislations, protocols and other procedures at constitutional level but the problem to enforce and implement the rules and regulations at the operational level lies with the executive bodies. The legislators are concentrated on developing new laws and creating new institutions, rather than building capacity for ensuring compliance with existing rules and working on enforcement mechanisms. In most cases, lack of political will, commitment and technical capacity of the implementing agencies at the grassroots level, weak institutional structure, linkage and

collaborations among relevant stakeholders are considered as main factors affecting successful implementation of national and international laws related to natural resources and environmental protection.

Table 7.5 shows a summary of rule making processes in Ethiopian natural resources management and environmental contexts. The analysis clearly shows that there is a very long time elapse between policy formulation and proclamation/regulation enactment. For instance, the environmental policy of Ethiopia was endorsed in 1997. After 5 years of delay, Environmental Impact Assessment (EIA) and Pollution Control proclamations were enacted in 2002. Even after 16 years of environmental policy, there is no specific regulation that clearly defines and enforces the EIA proclamation.

Table 7.5: Lengthy law making process in resource management and governance

Issue	Policy issued or adopted	Proclamation enacted/revised	Regulation enacted	No. of years took to enact proclamation/regulation
Land resources	1995 (inserted in FDRE Constitution)	1997/2005 (Rural land Administration-Federal)	No specific regulation	2 years (for the 1997 Proc.) 10 years (for the revised Proc.)
		2005 (Expropriation of Landholding)	2007	10/12 years
		2000/2006 (Rural land administration- ANRS)	-2004 (for 2000 proclamation) -No specific regulation for 2006 revised proclamation so far	5 years (for the 2000 Proc.) 11 years (for the revised Proc.)
Water resources	1999	2000	2005	1/6 years
Fish resources	No specific policy so far	2003 (Federal and Regional)	2007 (ANRS)	4 years
Wetlands resources	No specific policy	No specific proclamation	No specific regulation	-
Environmental issues	1997	2002 (EIA Proc.)	No specific regulation so far Draft guideline[19] (2003)	5/16 years
		2002 (Pollution control Proc.)	2008 (Prevention of Industrial Pollution Regulation)	5/11 years
		2007 (Solid waste management Proc.)	No specific regulation so far	10 years

Source: Review of policy documents, proclamation and regulations own presentation, 2012

[19] Procedural Guidelines and Review Guidelines, which have been finalized in 2003.

Box5: The lengthy law making process and its impact on fish resource governance

Although Ethiopia has not yet formulated a specific policy for fishery, the enactment of the Fishery Development and Utilization Proclamations and legislations in 2003 at Federal and Regional level was considered as a breakthrough to protect fish and other aquatic resources in Lake *Tana* sub-basin. However, it took 4 years to endorse the Regional regulation in 2007. After delay for 3 years, the Regional Parliament approved the Regional Fisheries Guideline. In 2011 guidelines were developed at Federal level and submitted to the council of Ministers. It is surprising that it is still not endorsed at Federal level where it affected the timely development of the Amhara Region Guideline. According to the regional Fishery Regulation for commercial fishing, every fisherman has to have a fishing license to access and harvest fish resources. Any fish harvester shall, having acquired a lawful license, have the right to harvest fish either permanently or temporarily, in an individual, group or associational capacity (Regulation No. 50/2007, Article 6/2). Besides, the license will incorporate the type and amount of fishing gear, the boat number and size and the number of days someone should fish on the Lake. And yet, there was no implementation directive to enforce the rules and regulations at user level and it was 10 years (in 2012) since the proclamations were enacted. However, the Bureau of Agriculture which has been given the responsibility to handle the overall governance of the fishery sector has not finalized preparation to start licensing of fishers and management of the resource. Despite the existence of the rules of the game at the constitutional level, there is no restriction on access and harvesting of the resources to protect illegal fishing at the user level. As a result fish resource access and harvesting rights are not restricted to protect illegal fishing in Lake Tana jurisdiction. Therefore, every potential fishermen can access and harvest at any time, using any type of fishing gear, as he/she wish. In recent times, the non-excludability characteristic of the fish resource entitlement also gives incentives for many youths entering into the fishing sector as an option for their livelihood. In due course, the fish resource has been overharvested, endemic species are depleted and conflict over fish resources is increasing. If there is no rule, obviously every fisherman will be tempted to harvest more, because there is no incentive to conserve the fish stock, as a result the fish he/she left will be picked up by another.

Source: Author, 2011

7.4.5 Procedural principles and values of the governing system

As proposed by an interactive governance perspective, procedural principles and values guide the process of decision making and interaction with a governance system (Bavinck *et al.* 2005; Kooiman *et al*. 2008). However, principles and values of the governance system can only become the foundation of governance systems if all the stakeholders agree and accept them, explicitly (Kooiman *et al.* 2008). The application of such principles is therefore to ensure that all stakeholders involved are treated as equals and have full access to the process of formulation of natural resource management and governance (Bavinck *et al*. 2005). It also helps to evaluate and criticize current governance systems and suggest reforms (Kooiman *et al*. 2008).

After a brainstorming session, during the stakeholder identification and analysis workshop, Lake *Tana*'s CPR management and governance system was evaluated and criticized based on the seven procedural principles suggested by Hobley and Shields (2000). The key purpose of the governance system assessment based on the procedural principles is to understand what is going on in the management and governance process with the intention of identifying the gaps and develop appropriate interventions in the long run. The seven procedural principles are presented in Box 6.

Box6: **Procedural principles of governance system**

A governing system is said to be;

Transparent- If everyone sees how decisions are made and who makes them.

Accountable- If decision-makers (both local and governmental) are procedurally and periodically answerable to those they represent

Comprehensive- If all interest groups are consulted from the outset in defining the nature of the problem or opportunity prior to any decisions about management being taken.

Inclusive- If all those who have a legitimate interest (in particular CPR livelihood dependent groups) are involved.

Representative- If decision-makers are representative of all interest groups.

Informed- If all interest groups understand the objectives of the participatory process, have adequate and timely access to relevant information.

Empowered- If all interest groups (youths, women and men), are capable of actively participating in decision making in a non-dominated environment.

Source: Hobley and Shields, (2000)

Principally, legitimate stakeholders who have interest in and power over CPRs in Lake *Tana* sub-basin should be part and parcel of any decision making process in their respective jurisdiction. Issues of representation, inclusiveness and transparency will be critical to building the necessary trust for each stakeholder's legitimacy. Additionally, legitimacy depends on the ability of the process to engage the stakeholders in a meaningful dialogue in which they feel ownership and the possibility to derive benefits. This requires full transparency, openness and respect (Vallejo and Hauselmann, 2004).

According to Lockwood *et al.* (2010), transparency refers to the visibility of decision-making processes; the clarity with which the reasoning behind decisions is communicated; and the ready availability of relevant information about governance and performance in an organization. Transparency is the basis for accountability in a natural resource governance system. It increases stakeholders' and public confidences, improves the efficiency and effectiveness of government policies and strategies. For the governance system to be transparent it requires the provision of reliable information on the overall socio-ecological, socioeconomic and political milieu for all relevant stakeholders. Transparency and accountability in natural resource governance is therefore essential (Darby, 2010).

Therefore, the question of whose views and interests are articulated in institutional regimes becomes crucial if CPR management and governance are at stake. Stakeholders who have a legitimate interest in and power over CPRs were supposed to be empowered and involved in the decision making processes that affect their resource use patterns and livelihood. However, in practice, legitimate stakeholders, particularly the voiceless stakeholders such as women, youths and local community, were not consulted and involved in the natural resource management and governance-related decision making process. As a result, powerful stakeholders, such as state authorities spanning from Federal to Regional level, rent-seeking private investors (local and international), and corrupted local *kebele* and district leaders might try to shape institutions in their favor. Hence, institutions are shaped by power relations among stakeholders and politics (Darby, 2010) rather than by participation and negotiation among stakeholders. Power relations within social, economic, legal, political and institutional spheres are fundamental to governance in natural resource. The involvement of the state through bureaucratic institutions is clearly visible in natural resources management (Khan, 2012).

This study confirms that current formal institutions are often defined in top-down processes (at constitutional and collective choice level) and do not take account of local social structures and of existing traditional community bylaws and institutions in a specific context. Institutions that govern CPRs were enacted and imposed upon users in a top down manner. As a result, they fail to include marginalized (for example, the *Negede woyto* community, women and youths) and less powerful stakeholders (local community) in an equitable way. Although property rights and formal rules that govern the use of CPRs exist, they are not credible in the eyes of local people and ignored stakeholders. Therefore, these groups are not committed to compliance with the existing rules and regulations. As a result conflicts are likely to emerge among stakeholders. It also undermines the transparency and accountability of how CPR concessions are allocated, who are involved in the allocation process and how the benefits of major investments in Lake *Tana* sub-basin are distributed between investors, regional and national governments and local communities.

Although it is based on subjective evaluation of analysts, the spider diagram (Figure 7.5) illustrates that the overall CPR management and governance system of Lake *Tana* sub-basin needs to dramatically improve the procedural principles of the governance system. Almost all the basic principles were falling inside the red (inner) circle of undesirable circumstances that need a dramatic improvement.

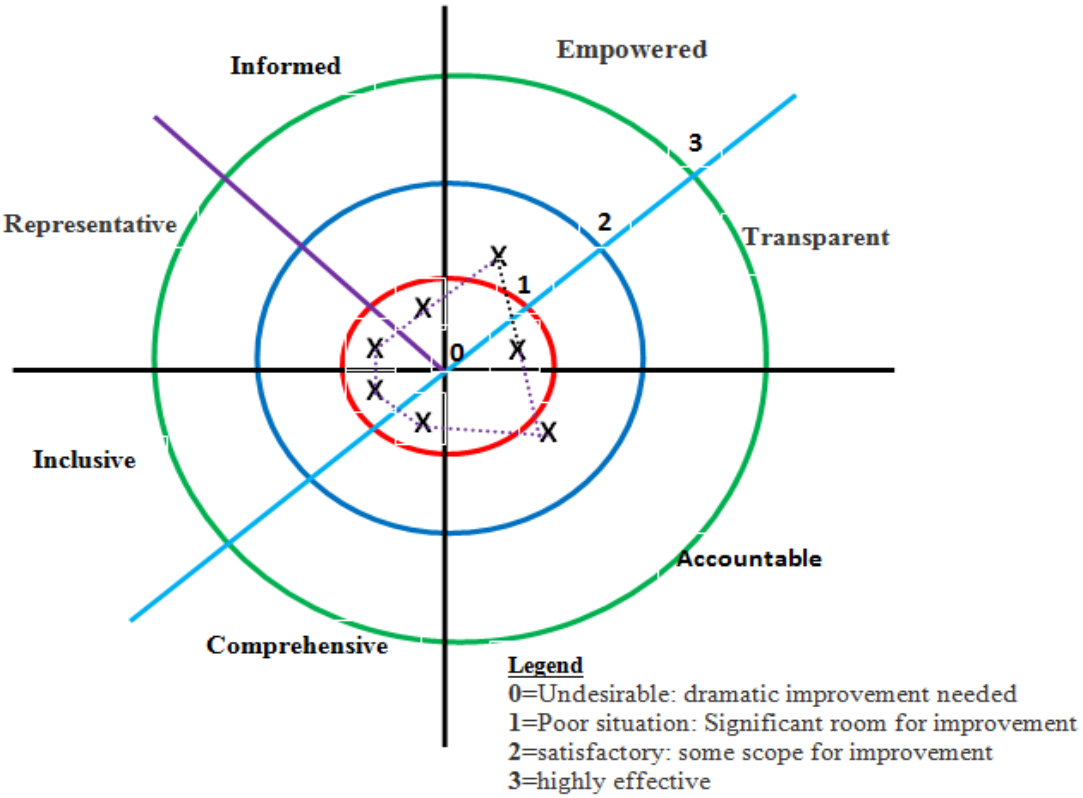


Figure 7.4: Spider diagram of evaluation of the CPR governance system
Source: Stakeholder Identification and analysis workshop, 2011

Governance rules and regulations must be clear in nature and seen as appropriate by local stakeholders (Fisher *et al*. 2010) and must be in accordance with the overarching concerns and standards of all stakeholders (Bavinck *et al*. 2005). Stakeholders can only be confident about the reliability of the resource governance process if they know what is going on in their commons. Decisions which govern the use of CPRs should be societal and participatory where viewpoints from multiple stakeholders are balanced against potential costs and benefits of various resource uses (Scrimgeour and Wicklum, 1996). However, if the rules are seen to come from another stakeholder group (or from 'above') in a top down approach then the legitimacy of the rules, regulations and compliance by local stakeholders is greatly compromised (Marshall, 2005).

In a participatory approach, management decisions are more easily embraced by those who have been part of the decision-making process, and greater attention is paid to the needs and expectations of all stakeholders (Ostrom *et al*. 1993). Empirical research studies in the highlands of Eastern African countries also show that when communities are fully involved in the process of natural resource management, bylaw formulation and enforcement and both conventional and indigenous bylaw enforcement mechanisms have been adopted and incidences of conflict, overexploitation, and abuse of natural resources were drastically reduced. The participation of stakeholders at different stages of the resource management and governance is also often seen as a key in mediating conflicts and relationships between government agencies, civil societies, resource users and the private sector. The engagement of relevant stakeholders in decision-making leads to collectively and socially desirable outcomes, as stakeholders share risk and responsibility in the process of natural resource management and governance (Khan, 2012).

A typical example here is that, the village bylaws in Southern *Tigray* regional state mitigated forest degradation by facilitating users to have common goals in the management of enclosures, and resolved the conflicts among users by using monetary sanctions (Yami *et al*. 2013). In addition, Persha *et al*. (2011) also confirmed that forest systems across the globe are more likely to have sustainable outcomes (above average tree species richness and subsistence livelihoods) when local forest users participate in forest rulemaking, whereas unsustainable forest system outcomes are more likely when users do not participate in rulemaking.

However, in the case of Lake *Tana* sub-basin, the majority of stakeholders were not involved in the decision making process regarding resource management and governance. Particularly resource users are not well informed about and aware of the proclamations and regulations enacted at the constitutional level. For instance, at the user level almost 95% of the sampled respondents do not know the existence of the Fishery Development and Utilization Proclamation and/or Regulations. On the other hand, from the sampled experts at district level, who are expected to enforce the rules and regulations, more than 87% were not even aware of these proclamations and regulations (see Table 7.6). This implies that,

once the rules and regulations were enacted at a higher level, either there was poor communication to the lower level to enforce the rules, or the process of rule making (the way rules come into existence) is not participatory to involve all parties in the fishery governance system.

Table 7.6: Respondents' knowledge about proclamation and regulation

Knowledge of fishery legislation	District experts (n=15)		User level (n=200)	
	Frequency	Percent	Frequency	Percent
Yes	2	13.3	11	5.5
No	13	86.7	189	94.5
Total	**15**	**100**	**200**	**100**

Source: Own survey result, 2011

Community members were also asked to evaluate how well the existing institutional arrangements (property rights of land and other resources) are clear and open to all resource users. The general perception is that institutional arrangements that are currently in place are not clear and open to all users. The majority (80%) of the respondents who are considered as the primary users of the CPRs agreed that the current institutional arrangements were poor/very poor to govern the CPRs and more than 65 percent of the respondents considered the existing rules and regulations as inefficient and not transparent for all users (see Figure 7.6). The rules and regulations were not effective in meeting the high expectations of users in equitable, fair and sustainable CPR use and management.

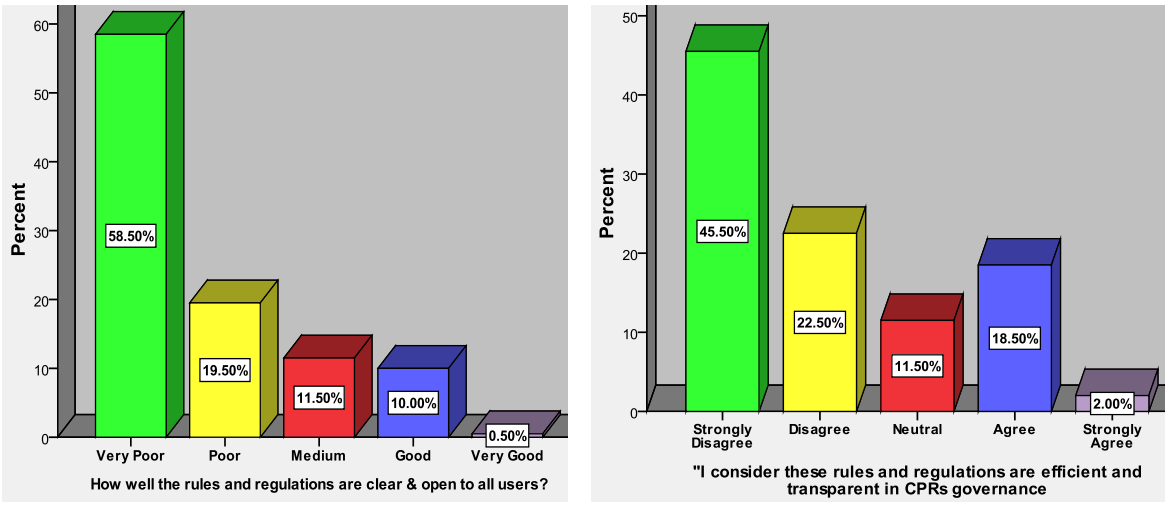


Figure 7.5: Resource users' perception of existing institutional arrangements (n=200)
Source: Own survey result, 2011

According to key informants of *Fogera*, *Libokemekem* and *Dembiya* districts, there are cases where rules and regulations are applied appropriately to administer natural resources. In some areas there were occasional arrests and detention of local farmers for wetland and grazing land encroachments. First they are judged by the community and local administrations. If they undertake not to repeat the offence, they will be freed with warning. However, sometimes cases will be directed to social courts and those who are found guilty will be penalized by imprisonment or money. Conversely, within the same *kebeles* or districts people who have a strong affiliation with *kebele* administrators were allowed to cultivate common wetlands, even they were not given warnings to stop their wrong doings. As a result, community members were confused about the administration procedures and for whom these rules and regulations are applied or not applied.

7.5 Chapter summary

In summary, CPR governance interaction between the systems to-be-governed and governing system takes place at different levels of the governance hierarchy spanning from the constitutional to the operational level. The systems to be governed (natural and human sub-systems) are dynamic; hence governance too must be flexible and open to change (Bavinck *et al*. 2005). A very good governance system demands that all relevant stakeholders' interests, values and power are identified, reconciled and appropriate relationships established and maintained. Moreover the governing bodies have responsibilities to have a clear understanding of the context of the system to-be-governed and stakeholders involved.

The outcome of the research questions highlights that an assessment of the relationship between the conditions under which policy and legal instruments are devised at constitutional level, and institutional contexts within which they are applied at operational level, reveals that a top down governing structure, a non-participatory policy and rulemaking process hindered a smooth relationship and plausible communication between the governors and the system to-be-governed. The existing institutional arrangements are not clear and open to all stakeholders. They are also inefficient and not transparent in meeting the high expectations of users in equitable, fair and sustainable CPR use and management.

Central-local incongruence has created a gap to harmonize the formal and informal rules in CPR contexts. Formal laws were enacted without considering the local context where community bylaws operated and even without the consent and consciousness of resource users and other relevant stakeholders. Potential stakeholders were not part of the policy and rulemaking process. They were not even consulted on issues of the CPR management and governance in their jurisdiction.

CHAPTER EIGHT

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 Introduction

The study set out to explore the current state and dynamics of CPRs, overall institutional environment, common-pool resource governance system and multi-stakeholder interactions in the context of sustainability and environmental changes. The study sought to address the following research questions: (1) what are the current states and dynamics of CPRs and its policy implication for livelihood security and sustainable CPR use, management and governance? (2) What are the drivers of change that affect CPR use, management and governance? (3) Who are the key players in the process of CPR use, management and governance and what are their interests and power over CPRs? (4) Why do conflicts arise among stakeholders and what are the underlying causes of conflict and resolution mechanisms? (5) What are the existing institutional arrangements that govern the behavior of CPR users and what are the factors influencing the effectiveness of CPR management and governance system?

The broad aim was to contextualize and better understand the complex socio-ecological interactions of CPR management and governance system in the Lake *Tana* sub-basin using an integrated Institutional Analysis and Development (IAD) and Interactive Governance (IG) framework. The reasons for applying an integrated approach were, firstly, the Lake *Tana* ecosystem comprises of very complex, dynamic and sensitive social-ecological systems that require a broad perspective to understand the real problems from different point of view. Secondly, to exploit the advantages both frameworks offer (both complement each other to maximize their strengths and minimize the weaknesses).

Generalization of findings has always been a sensitive issue for all case based research findings. However by considering Lake *Tana* sub-basin as a broad case that comprises the Lake *Tana* (water), fish and wetland commons sub-cases, this research has come up with relevant conclusions and recommendations specifically for Lake *Tana* sub-basin and that could also have relevance in similar contexts beyond the sub-basin. The following sub-sections address the conclusion of major findings of this study, the theoretical and policy implications followed by recommendations and proposal for future research in the sub-basin.

8.2 Conclusions from the study

The outcome of the first research question addressing the current states and dynamics of CPRs and its policy implication clearly shows that, Lake *Tana* Ecosystem has a national and global significance on which huge livelihood, economic and socio-cultural systems are highly dependent. It is considered as one of the key growth corridors selected by the Ethiopian government for development. As a result Lake *Tana* ecosystem is under severe threats of development pressure and resource degradation. A number of development activities with potential negative externalities have been taking place in and around Lake *Tana*. As a result, CPRs are being over exploited and degraded beyond their harvestable limit. Research reports also show that there are loss of some fish species and extinction of endemic *labeobarbs*. For the last two decades there has been a dramatic loss of wetlands in Lake *Tana* sub-basin. The Lake water is being polluted due to industrial waste, agricultural practices and poor municipal sewerage system. All these development pressures coupled with global environmental changes have cast doubt on the sustainability of the use value of Lake *Tana* in general and other CPRs in particular.

The second research question regarding the drivers of change that affect CPR use, management and governance reveals that, due to dramatic population and development pressure, unclear property rights, uncontrolled resource use pattern and subsequent resource demand, natural resources are increasingly subject to intense competition and overexploitation in Ethiopia and Lake *Tana* sub-basin in particular. The problem is worsening in cases of CPRs where property rights issues and rules governing these resources are unclear and it is difficult to exclude potential users from the resource system. As a result, resource user groups and other stakeholders with diverse interests in and power over CPRs (water, fish and wetlands) are confronted with a broad array of resource use, management and governance problems in the past two decades.

The outcome of the third research question that depicts the key players in the process of CPR use, management and governance highlights the existence of multi-stakeholders in the sub-basin. When the multi-purpose values of the whole Lake *Tana* sub-basin are considered, there are multiple stakeholders with diverse interest in and power over CPR use, management and governance. The stakeholder identification and analysis reveals that the Bureau of Environmental Protection Land Use and Administration, the Bureau of Agriculture, the Bureau of Water and Energy, Administration (from Federal to local level), and Local Communities had a particularly strong and legitimate claim to manage and govern CPRs in the study area.

The fourth research question addresses the reasons why conflict arise and the underlying causes of conflict and resolution mechanisms. The outcome clearly shows that access and availability of basic CPRs has been declining leaving the wider community vulnerable to resource scarcity and seasonal shocks. At community level competition over declining CPRs has sparked internal conflicts between individuals, between groups, between individuals and groups. Intercommunity conflicts are occurring between neighboring or bordering villages and districts. Due to unclear property rights, unclear boundaries between land use and bordering *kebeles* and/or districts, incompatible interests of stakeholders and scarcity of resources, conflict over CPRs in Lake *Tana* sub-basin is increasing. Based on the type and severity of conflicting scenarios, both formal (court/justice system) and informal ways of conflict resolution mechanisms are practiced in the area. Although they are not effective as before and weakened by distrust among community members and insufficient support from local government, a range of traditional or non-formal methods were used to manage or solve CPR-related conflict at community and intercommunity level.

At higher levels there are divergent and often conflicting interests of stakeholders, an overlap of mandates over CPR use, management and governance. Those mandates are not clear and usually overlap under the broad umbrella of natural resource management and governance. Despite this overlap, in the Ethiopian natural resource management and governance context, the executive powers of stakeholders are usually determined by the political powers of individuals leading the organizations at different levels of governance. Though vested with different powers to administer and control natural resources, the real powers of the executive agencies both at Federal and Regional level are manifested in the political power of individuals who lead the agencies or ministries. To be accepted by other stakeholders as a legitimate decision maker on CPR issues, the power given to the executive agencies by the Law of the land has to be in line with the political capital of the leaders.

The last research question that addresses the performance of existing institutional arrangements to govern the behavior of CPR users and the factors that influence the effectiveness of CPR use, management and governance shows that the current natural resource governance structures are not effective in managing and governing CPRs. Ideally, the governance interaction between the governance system (institutions and the governor) and the system-to-be governed (the natural and human sub-systems) has to come up with a positive outcome (such as efficiency in resource use, equity in distributional outcomes, stakeholder participation, accountability and adaptability of the system etc.) in order to guarantee sustainable natural resource use, management and governance in Lake *Tana* sub-basin. However, if one has to ask whether the present-day natural resource governance system of Ethiopia is effective and appropriate for the current and anticipated future developments in Lake *Tana* sub-basin or not, the likely answer is 'no'. While there are natural resource policies, laws and regulations enacted at constitutional and in the collective choice arena, implementation and enforcement of these policies and laws at user level is not satisfactory.

Besides, a top-down and non-participatory policy formulation, law and decision making process overlooks the local context (local knowledge and informal institutions) and fails to understand the dynamic, complex and sensitive nature of the natural and human sub-systems. This seriously affects the CPR use, management and governance system in the region. The natural resource management and governance system has failed to attain basic procedural principles (such as transparency, accountability, comprehensiveness, inclusive, representativeness, informed and empowerment of all interest groups). The management and governance of natural resources is not well devolved to the lowest possible level with technical and financial capability. As a result legitimate stakeholders were not consulted and involved in the natural resource management and governance-related decision making process.

At a constitutional level, the government's existing policy and institutional framework for natural-resource management and the environment seems adequate and sound. Policies are mainstreamed in sectoral programmes which are implemented at the Federal, Regional and district (*wereda*) levels. The problem however lies in the effective implementation of policies and enforcement of proclamations, laws, rules and regulations at operational level. Though rules and regulations that govern CPRs are enacted at the highest level of hierarchy, they are not implemented effectively at the user level. Due to central-local incongruence, government technical agencies and local level governance structures have been ineffective in managing and governing CPRs. It seems they are neither able to replace many of the resource management and governance functions previously provided by indigenous cultural and communal institutions nor complement the informal institutions.

That means there is a communication and/or implementation gap between the governing system (policy/law making and executive agencies at constitutional/collective choice level) and the system to be governed (particularly the social subsystem in which the human element is the crucial component). This reveals that community participation in the rule making process is very minimal. Relevant stakeholders at the user level were not involved in the policy/law making process. As well as non-involvement in the process, once the

rules and regulations were enacted they were not well informed about the rules of the game, to better practice the rules and regulations that govern their behavior in relation to CPR use, management and governance.

Generally management and governance problems of the Lake *Tana* ecosystem are expected to worsen in the coming years as population, hydropower and irrigation demands, and other development activities continue to increase. Researchers and environmental activists have sounded alarm bells concerning the threats to Lake *Tana* and recommended more policy intervention and action research to protect the Lake ecosystem from the serious challenges that it faces. In addition, there is global and regional research evidence that indicates the current threats possibly will have unprecedented impact on the region's social, economic and environmental conditions. Unless timely, protective policy intervention measures are put in place and awareness is created among potential stakeholders, there might be serious environmental degradation which ultimately ends up with a complete collapse of the whole ecosystem.

The following section depicts the theoretical and policy implication of this research.

8.3 Theoretical and policy implications

Most governance analyses focus on static descriptions and embrace only a part of the processes of importance from a disciplinary perspective (Pahl-Wostl & Toonen, 2009). Young (2008) also noted that knowledge regarding the nature of change in the institutional dimensions of socio-ecological systems remains relatively underdeveloped. He further highlighted the need for an integrative approach towards analysing governance processes in social-ecological systems from a broad perspective. Complex and dynamic socio-economic and environmental systems are difficult to be represented and explained by a single theory or framework. Therefore this research contributes towards integrating different theories (such as governance theory and CPR theory). It also provides further insights into how Institutional Analysis and Development and Interactive Governance frameworks can be integrated to understand complex, dynamic and sensitive systems. Besides, the study is interdisciplinary in nature drawing on different theories and approaches that link different fields such as institutional economics, governance, management, ecology, politics and system thinking among others.

This study confirms that degradation of common-pool resources due to human and economic development activities in and around Lake *Tana* coupled with climate change has been considered as one of the critical challenges faced by local community and other stakeholders. This is mainly due to lack of a clear resource governance system, comprehensive policies, or integrated environmental and development goals. There are sectoral policies (such as water management policy) but there is a lack of coherence among policies and there is no holistic approach to mitigate the environmental degradation in the sub-basin.

Evidence from several studies, including Hailu (2005) and this thesis seems to point to the fact that a one sector-few stakeholder policy, management and governance approach such as a water-only policy framework, top down rule making and enforcement strategies could not address the problems of other CPRs (i.e fish, wetland) in the sub-basin. Therefore, this

study has used empirical findings to show that the current natural resource management policy framework (such as water resource management, land and environmental policies) is not comprehensive enough to incorporate the knowledge and interests of all potential stakeholders, and fails to engage relevant and/or grass root level stakeholders in the process of policy formulation and implementation.

Integrated and multi-stakeholder approaches are usually put in place only on paper rather than implemented at the grassroots level. Policies have not been comprehensive enough to address specific resource systems like fish and wetlands, rule and policy making processes were not participatory to address multi-stakeholder interests. Overall, the Ethiopian natural resource governance system lacks coherent policy and governance structures that depict the degree to which policy, program, and institutional arrangements agree in intent, are consistent and logically connected to the operational level. As a result, the policy framework failed to take into account local social structures and existing traditional community bylaws and institutions in a specific context.

A multi-stakeholder perspective to CPR use, management and governance suggests the need to look beyond the traditional one-sector-single stakeholder approach to recognize and explore the complex socioeconomic, cultural relationships and interactions through which local community, private investors, governmental, non-governmental, national and international stakeholders are engaged in the process and interact to come up with an innovative solution.

The theoretical implications of this study suggests the need for bottom-up and inclusive policy planning, management and governance approaches, where grassroots level stakeholders are involved at all stages of policy planning, implementation and decision making. The outcome of this research supports the shift from the government to a new governance approach and interactive governance theory whereby policy making procedures have become more communicative and more participatory, concerned with the exercise and distribution of power and responsibilities, the ways in which decisions are taken, and the participatory practices used to ensure those stakeholders affected by

decision-making are able to have an input in the process of resource management and governance (Edelenbos, 2005; Kooiman *et al.* 2008; Lockwood *et al*. 2010). Hence, devolved and collaborative governance arrangements are needed to provide more co-ordinated approaches to the challenges presented by complex problems, and attempt to integrate activities of diverse stakeholders, instruments and institutions (Howlett & Rayner 2006).

In complex situations such as the Lake *Tana* sub-basin where the State is undermining the roles of local community and local institutions co-management approach is essential. Co-management is a hybrid regime combining centralized and decentralized, state and community institutions in which several degrees of power and responsibilities are shared between State regulations and self-governing local level institutions for the management and governance of CPRs (Feeny *et al*. 1990; Singleton, 2000).

Singleton (2000) indicated that co-management has the potential to succeed where both States and communities alone have failed. It opens up new possibilities for constructive engagement between state and communities. She further explained that the basic rationale for co-management is grounded in both *efficiency* and *legitimacy.* The *efficiency* argument is twofold: first, both higher quality and less costly information is available in a co-management process because local knowledge about the functioning of a particular ecosystem (such as Lake *Tana* ecosystem) can be combined with scientific knowledge produced by state agency scientists (from research institutes and higher institutions), to produce a more complete, finely-tuned set of information upon which to base management and governance decisions; and second, monitoring and enforcement of rules and regulations can be more effective by virtue of being local, while oversight by state regulators interjects some measure of accountability to the larger collectively. The *legitimacy* of the system is enhanced by involvement of resource user-groups community members and other relevant stakeholders, which may result in people being more willing to comply voluntarily with and even exceed the requirements placed upon them.

From the natural systems point of view, Lake *Tana* ecosystem demands the governing system endeavor to realize a holistic approach and understand the whole system rather than its components. It operates as a system, and has its own dynamics and characteristics, and not merely as a collection of individual components such as water, fish and wetlands. Lake *Tana* comprises of mutually interrelated components of river system, water, wetlands, fish and other aquatic resources characterized by a continuous state of evolution and change, spanning many sectors as well as international, national, regional and local spheres of government.

This implies that a one component or sub-system approach like water-only policy framework may not address the problems of other CPRs such as fish and wetlands. Water policies and strategies alone may not be effective to protect or conserve the aquatic ecosystems, rather they have to be integrated with other policies like land use and forestry policy (IBC, 2012). A systems thinking approach to problem solving sees each problem of the Lake *Tana* ecosystem as part of the overall system and recognizes that if one part of the system is changed to solve one problem, the nature of the overall system is likely to be changed as well. Hence Lake *Tana* ecosystem has to be seen as part of a complex web of interconnected and interacting systems and sub-systems, rather than in a narrower sense such as a water/fish only approach towards its management and governance. This equally forces attention on the bigger picture in terms of wider processes of change at Lake *Tana* sub-basin level, rather than concentrating on discrete sub-systems.

8.4 Recommendation

For controlled sustainable development and proper management and governance of the Lake *Tana* ecosystem, enacting legislation at the constitutional level is not a panacea to protect resource depletion and minimize conflict among resource users; rather the process of rule making should be participatory, it has to be communicated with stakeholders in the action situation (where rules interact with stakeholders to reach certain outcomes) and the legislation has to be enforced at the user level. Rules and regulations should be integrated with the local institutions and have to be devolved to the lowest level of governance where community and key stakeholders' participation is vital for the success of sustainable resource use, management and governance. Legitimate stakeholders should be responsible and accountable for the overall Lake *Tana* resource governance system.

Therefore devolution of power to the lowest level is imperative to reconcile the complex CPR problems in the sub-basin. Devolution of power to manage and govern CPRs, if it is to be effective and equitable, needs to take into accounts the multiple functions and heterogeneity of users of CPRs (Williams, 1998). Thus stakeholders have to devise innovative ways that reconcile the needs of each stakeholder who has a legitimate stake in Lake *Tana* sub-basin. There should be synergies between agriculture, aquaculture, biodiversity, hydropower generation, tourism, wetlands and water resources management. Conservation of natural resources through sustainable ecosystem management and planned development is the key to secure Lake *Tana*'s future.

There is also a need to integrate ecosystems conservation and development to ensure sustainable resource use and livelihood security for the wider community in the sub-basin and beyond (including the downstream riparian countries). Policy-makers need to develop policies and practices that distinguish between situations where conservation and development goals are compatible and situations where there may be conflicts. In order to jointly achieve sustainable production, ecosystem/biodiversity, and rural livelihood goals, it requires building bridges between often divergent views and interests among stake-holders. Therefore, the management and governance of complex systems like Lake *Tana*

ecosystem needs to be seen not just from the eyes of the government or resource users but also from the points of views of its multiple stakeholders.

The Federal government is the vested power to determine and administer the utilization of the waters or rivers and lakes linking two or more Regional states or crossing the boundaries of the national territorial jurisdiction (FDRE Constitution, Article 51/11); whereas the Regional states are vested power to administer land and other natural resources (presumably water bodies in its jurisdiction) in accordance with Federal laws (Article 52/2/d). Though Lake *Tana* is the source of the Blue Nile and involves multi-stakeholders, it is not shared by any other Regional state. This implies that the Regional government has a constitutional right and mandate to administer the Lake ecosystem. On the other hand, the struggle for Nile water utilization among riparian countries has witnessed tensions in recent times. This scenario will have strong and uncertain repercussions on Lake *Tana* sub-basin resource utilization and development (particularly water resource development).

Therefore, there should be a strong and legitimate Lake *Tana* ecosystem management and governance system. The establishment of a Lake *Tana* ecosystem governance structure and/or authority, by the Council of *Amhara* National Regional State is recommended for the sustainable development in and around Lake *Tana* Growth Corridor. The governance structure and/or authority must be able to set direction and priorities, exercise clear and accountable leadership, address conflicting mandates among stakeholders, and facilitate decisions across Federal, State and Local authorities and interests in its jurisdiction. The most appropriate level and governance structure for the Lake *Tana* ecosystem may be negotiated among relevant stakeholders. It could be structured at subsystem level (fishery, wetlands and other resources) under the umbrella of the Lake *Tana* ecosystem governance. Informal CPR institutions at user level are considered as a gate for formal institutions to penetrate into the community. Therefore, the governance structure has to be in line with and support community based CPR institutional arrangements.

In summary, there is no single 'magic bullet' solution for CPR use, management and governance problems of Lake *Tana* sub-basin; yet a single stakeholder cannot bring a decisive positive change to improve the existing scenario in the region. As Eshete D. (2008), pointed out and this research confirmed, Lake *Tana* ecosystem is a multipurpose resource system which could be a source of conflict among stakeholders at different scales (local, regional, national and international). Despite some recent initiatives like 'The Nile Basin Initiative' at sub-regional level (higher level), there are no prominent forums or platforms, in the jurisdiction of Lake *Tana* sub-basin that facilitate the formulation of efficient policy frameworks and a governance system. There is no forum that brings different stakeholders together. Dialogue is needed to help all stakeholders to understand and adopt the principles that will guide their governance system (Bavinck *et al*. 2005). Therefore, it is imperative to organize multi-stakeholder platforms at these levels that could facilitate the interaction of stakeholders towards a better outcome in CPR use, and in the management and governance system. These platforms will create a conducive environment for stakeholders to discuss, negotiate and devise a mechanism to combat problems in the process of CPR use, management and governance.

As described by Buck and Scherr (2009), platforms are forums for discussion, debate, learning, negotiation, and decision making about a particular issue (such as policy), problem, or development strategy. Platforms emphasize vertical communication and learning patterns, bringing together diverse stakeholders associated with a particular issue including policymakers, scientists, development educators/advisors, local community leaders, and local level resource user groups. In addition as Rory and Tina (2011) described, multi-stakeholder platforms are decision-making bodies with the mandate of allowing stakeholders to bargain over the generation of policy. They are frequently employed to address the complex issues involved in managing common-pool resources, allowing for representation of indigenous populations (like the *Negede woyto* community), government officials, and private sectors. Behavioral requirements for a platform include political will and commitment, openness, accessibility, representation, transparency, and fairness.

Development is a necessary condition for the survival of developing countries like Ethiopia. However, development should not be unsustainable to worsen the existing conditions. It has to be planned and implemented without affecting the sustainability of the natural resource base, livelihood of the local community and the long-term economic growth and the country's drive towards attaining food security. More importantly, the recent environmental catastrophe of the Aral Sea (in Asia, by 2007 it had declined to 10% of its original size); Lake Chad (in Africa) and Lake *Haromaya* (in Ethiopia) should be a lesson and a guideline for any development activities around Lake *Tana* growth corridor in general and water resources development in particular. It is not only the presence of development that results environmental crises in the form of environmental degradation and resources depletion but also the absence of development within the sub-basin can also lead to environmental stress (Diong and Allard, 2004). The objective of this research conclusion therefore, is not against 'development', rather it is recommending 'wise use of resources' and systemic ways of seeing the Lake *Tana* ecosystem as a whole for sustainable development.

Seeking innovative ways of saving the Lake *Tana* ecosystem from the serious challenges that it faces is imperative for those who have a stake in the Lake *Tana* sub-basin. Particularly, the *Amhara* National Regional State Council in collaboration with the Federal government is responsible to lead the initiative and oversee the Lake ecosystem. So as to better understand the complex scenario of CPRs and come up with comprehensive policy options that govern Lake *Tana* ecosystem, a system thinking approach is recommended in the process of policy dialogue, formulation and implementation, and should contribute to saving the Lake ecosystem from the foreseeable threats and speculations. It is essential to see the Lake ecosystem from its broader perspective than from its parts separately (such as water, fish, or wetlands).

Finally, keeping the health of Lake *Tana* ecosystem for sustainable resource utilization and socioeconomic development of the local community and the wider population beyond the sub-system should be the priority agenda. There is also the Amharic proverb that says that *'ታሞ ከመማቀቅ-አስቀድሞ መጠንቀቅ'; 'Tamo kememakek-askedimo metenkek'* literally equivalent to a notable quote of Benjamin Franklin, '*an ounce of prevention is better than a pound of cure'*. This proverb would imply urgent protective measures should be put in place that does not compromise a safe and sustainable environmental and socio-economic development for the Lake *Tana* ecosystem. The earlier we protect and conserve the system, the better we can save the Lake ecosystem from its current threats.

Given such conditions, simply putting an attractive article in the proclamations, legislations and regulations or adding catching words and statements in a contract document (like land certificate or leasing documents) about tenure security, Environmental Impact Assessment (EIA) and environmental protection is not enough to protect the Lake *Tana* ecosystem. Rather we need genuine political commitment and readiness from the top level governance structure to the lower level for the realistic implementation of environmental policies, rules, regulations and other protective measures. It is well known that there is often a tradeoff between development and conservation goals; however, stakeholders have to devise innovative governance systems that result in a 'win-win' rather than 'win-lose' situation. Otherwise, ultimately they might end up with a 'lose-lose' scenario.

8.5 The way Forward: Limitations and Implications for Future Research

Proper research evidence is necessary on the performance and effectiveness of the resource governance system particularly at the middle and lower level structure of the system. The results and discussions of this research should be supplemented by research conducted so far in identifying and defining the major CPR management and governance problems, challenges, gaps and alternative solutions in Lake *Tana* sub-basin. However, due to time, financial and other logistical constraints, this study could not address all aspects and the big picture of Lake *Tana* sub-basin. Respondents (both resource users and other key informants) may not disclose the realities with regard to sensitive issues like land policy, administration and good governance problems. The stakeholders analyzed and presented, and CPR cases selected in this research may not be fully comprehensive; rather they are intended to provide an initial springboard for further research and participatory law and policy making processes. Therefore in some cases the research results presented here are considered as indicative (needing further research and evidence) rather than definitive. More importantly, the results should 'sound an alarm bell' for those who have a 'stake' in Lake *Tana* so that they will act together to save the Lake ecosystem from the serious challenges that it faces.

This research addressed more observational types of questions (what, who or which) than analytical (why or how much) questions regarding CPR use, management and governance problems in Lake *Tana* sub-basin. It is based on an integrated exploratory[20] and descriptive[21] research framework. Therefore, the output of this research is expected to facilitate future research (providing more detailed explanations of variables) focusing on explaining why different stakeholders pursue goals only based on their interests in the process of CPR management and governance? And how and why local or traditional conventions are losing ground in governing and managing CPRs at different field settings?.

[20] Which is broad in focus and rarely provides definite answers to specific issues.
[21] which seek to provide an accurate description of observations of a phenomenon.

Hence, further research on detailed cause and effect relationships between pertinent variables, particularly population growth, new market opportunities, introduction of new farming systems (like rice farming), versus status and sustainability of CPRs is recommended. In addition this research output could also be used as a precursor for action research and policy interventions to delineate a buffer zone around Lake *Tana* and define boundaries between farmlands, wetlands, and grazing lands in Lake *Tana* sub-basin.

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10. APPENDICIES

Appendix 1: Participant of stakeholder identification and analysis workshop Wereta, 2011.

No	Participant's Name	Organization	Profession	E-mail address/ Phone number
1	Addis Minahal (F*)	Bahir Dar University	Rural Development	addismin2010@yahoo.com
2	Aklog Tegen	*Fogera* district EPLUA	Environmental resource valuation	aklogtegen@gmail.com 0918088173
3	Babiyew Sibhat	Libokemkem district EPLUA	Environmental resource valuation	sbabiyew@yahoo.com 0913258930
4	Berhanu Moges	EWNRA, *Fogera*	Field technician	0918024097
5	Daniel Nigussie	Wereta ATVET College	Agricultural Extension/ Educational Planning	any_266@yahoo.com 0918768707
6	Goraw Goshu	BDFALRC	Environmental Science	gorawha@yahoo.com 0918779854
7	Keffie Minale	EWNRA, *Fogera*	Field office coordinator	mkeffe@yahoo.com 0918706794
8	Melkie Achenef	Wereta ATVET College	Forestry	0918700196
9	Mengistie Taye	Bahir Dar University	Animal production	mengistietaye@yahoo.com 0918768619
10	Solomon Addisu	Bahir Dar University	Natural resource management	soladd2000@yahoo.com 0911041030
11	Teklu Damtie	Regional EPLUA	Ecology	tekludamtie@yaoo.com 0918706811
12	Tesfaye Melak	Bahir Dar University	Fisheries & Aquatic Science	tesfayemelak@yahoo.com 0911990091
13	Woldegebrel G/Kidan	Regional EPLUA	Environmentalist	wgerekidan@yaoo.com 0918780444
14	Yibeltal Ayenachew	Bureau of Agriculture (Regional)	Agriculturalist	0918819088

* F-Female

Appendix 2: Characteristics of Lake *Tana*

Characteristics	Description
Location	North Western Ethiopia: Latitude (m):12° 10′0′′: Longitude:37° 20′0′′
Altitude	1830m
Volume	28.00Km^3
Surface Area	3,600.00Km^3
Depth	Mean depth:9.0m: Maximum depth:14.0m
Residence Time	1.5 years (Kebede *et al*. 2009 reported 3 years)
Origin	Volcanic
Trophic State	Mesotrophic
Type	Fresh, permanent, natural
Catchment	Catchment area:16,500.00km^3, Catchment/surface area ratio: 5:1

Source: Compiled from LakeNet, 2012. http://www.worldlakes.org/lakedetails.asp?lakeid=8568

Appendix 3: Environmental treaties and conventions ratified by Ethiopia (as of 2012)

S.No	Treaty/convention/agreement/protocols	Date signed/ ratified	Proclamation
1	Convention on Biological Diversity (CBD) (1992)	10 June 1992/31 May 1994	No 98/1994
2	Cartagena Protocol on Bio-safety (2000)	24 May, 2000	No 362/2003
3	Convention concerning the Protection of the World Cultural and Natural Heritage (1972)	6 July 1977	-
4	Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973)	5 April 1989	No 14/1970
5	The United Nations Convention to Combat Desertification (UNCCD) (1994)	15 October, 1994/27 June 1997	No 80/1997
6	United Nations Framework Convention on Climate Change (UNFCCC)* (1994)	1992 /31 May 1994	No 97/1994
7	Kyoto protocol on the reduction of greenhouse gases (1997)	1 February 2005	No.439/2005
8	Convention of the Migratory Species of Wild Animals (1979)	4 June 2009	No. 634/2009
9	Vienna Convention for the Protection of the Ozone Layer (1985)	11October 1994	-
10	The Montreal Protocol on Substances that Deplete the Ozone Layer (1987)	11 October 1994/ 25 November 2009	-
11	The International Treaty on Plant Genetic Resources for Food and Agriculture (2001)	3 November, 2001	No 330/2003
12	The Basel Convention Amendment on trans-boundary movement of hazardous waste (1995) and Basel protocol	3 July 2003	No 356/2003/ No. 357/2003
13	The Stockholm Convention on Persistent Organic Pollutants (2001)	17 May 2002 / 9 January 2003	No 279/2002
14	Bamako Convention (1991)	3 July 2003	No. 355/2003
15	The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1998)	2 July, 2002	No 278/2002
16	Climate Change-The Kyoto Protocol, (1997)	13 July, 2005	No 439/2005
17	The United Nations Convention on the Law of the Sea (1982)	10 December 1982/ 8 June 2012	No 742/2012
18	International Plant protection convention (1951)	2 October 2005	-
19	Agreement for the Conservation of African Eurasian Migratory Water Birds (1995)	4 June 2009	No. 635/2009
20	African Convention on the Conservation of Nature and Natural Resources (1968)	15 September, 1968/not yet ratified	-

***** But has not ratified the London (1990), Copenhagen (1992), Viena (1995), and Beijing (1999) Amendments
Year in bracket indicates the year when the treaty first adopted

Appendix 4: Interview schedule for the household survey

General Information

Name of Respondent: _____

Wereda/district:_____

Ethinicity:_____

Religion:_____

Kebele/Peasant Association (PA):_____

Name of Village: _____

Date of interview: _____

Name of enumerator:_____ Signature:_____

Questionnaire code:_____

1. Demographic characteristics of sample of respondents

No	**1.1 Name of HH Members** (*use the first name only and start with the HHH*)	**1.2 Sex** Male=1 Female= 2	**1.3 Age** -----years	**1.4 Marital Status** Single =1 Married =2 Divorced =3 Widowed =4 Never married =5	**1.5 Education Level** Illiterate, no schooling =1 Adult Education =2 Grade 1-4 =3 Grade 5-8 =.4 Grade 9-10 =5 Preparatory(11&12) =6 Other(Religion) =7	**1.6 Occupation** Farming =1 Farming+off-farm=2 Farming+Fishing=3 Farming+Non-farm =4
01						
02						
03						
04						
05						

HH- Household; HHH- Household Head

NB: please specify those nonfarm and off-farm activities that sample HH engaged in it.

Off-farm- means the participation of individuals in remunerative work away from a "home plot" of land related to Agriculture.

Non-farm- means activities that individuals engaged in non-Agricultural activities

2. What best describes your role in the community? *(Multiple responses possible. Please tick the appropriate box(es).*

1. Religious leader	☐
2. PA (village) administrator	☐
3. Committee member of ----(If any)	☐
4. "Militia"	☐
5. Member of *kebele*/*wereda*/zone/regional Cabinet	☐
6. An ordinary resident	☐
7. Others (specify)……	

3. Scoring and ranking of livelihood activities

Please give a score of 0 to 5 for each livelihood activities listed below

Activity	***Income***	***Food***	***Other subsistence products***	***Total Score***	***Overall Rank***
Crop production					
Animal husbandry					
Fishery					
Wetland grass (Papyrus) collection and selling					
Wage labor (non-agriculture)					

Scoring is on a scale of 0 to 5 (maximum)

4. Amount of land owned by the HH in hectares		**Owned**	**cultivated**
	0-1	☐	☐
	1-1.75	☐	☐
	2-2.75	☐	☐
	3+	☐	☐
5. Number of livestock owned in numbers	Cattle		
	Sheep		
	Goat		
	Equine		
	Others (specify)……..		

6. Common pool resource use pattern and management system

A. Resource use pattern

6.1 Who determine, who can live in an area and access local resources, and how much of each resource different households are allowed to use? ***Multiple responses possible. Please tick the appropriate box(es).***

Decision Makers	**Who can live**	**Who can access**	**How much resource allowed to use**
1. Village leaders/*kebele* administrator	☐	☐	☐
2. Village level natural resource officers (DAs)	☐	☐	☐
3. Spiritual leaders	☐	☐	☐
4. No one (everybody can live, access and use)	☐	☐	☐
5. Any other, please specify ----------			

6.2 Who owns and control Common pool resources (Fish & wetlands) in your Locality *(multiple responses possible. Please tick the appropriate box(es).*

Who owns and/or control	Owns	Control
1. The community	☐	☐
2. The Government	☐	☐
3. Community & Gov. jointly own and control	☐	☐
4. Private/individually	☐	☐
5. It is not clear who own/control	☐	☐
6. I do not know	☐	☐
7. Other (s) specify ---------		

6.3 Do you and your family have access to fish resource in this area?

1. Yes ☐ 2. No ☐ 3. We never think of the resource ☐

6.4 Do you and your family have access to wetlands resources in this area?

2. Yes ☐ 2. No ☐ 3. We never think of the resource ☐

6.5 If the Answers for Question No 6.3 and/or 6.4 is no, what are the reasons behind?

6.6 Which are the problems that you and your family have experienced with respect to the CPRs?

_____

B. Conflict over resource

6.7 From working in other areas, we have seen that conflicts can be very common between people living in the same area about the use of CPRs. In your locality, how frequently conflict among resource users aroused?

1. Always ☐ 2. Seldom ☐ 3 Never happened ☐ 4. I don't know ☐

6.8 Could you perhaps give some examples of such conflicts in this area?

_____

6.9 Are conflicts over resource more prevalent in the past 10 years?

1. Yes ☐ 2. No ☐ 3. I don't know ☐

6.10 In your opinion, what are the nature and sources/causes of Conflict? *Multiple responses possible. Please tick the appropriate box(es).*

1. Scarcity of resource and competition due to population growth	☐
2. unclear property rights	☐
3. Unclear boundaries (between land use and bordering *kebele*s and/or districts)	☐
4. Multiple interest of stakeholders (including Government offices like BoARD and EPLUA)	☐
5. Poor resource governance	☐
6. Any other, please specify ----------	

6.11 Were you involved in any conflicting issues in relation to CPRs (fish & Wetland)?
1. Yes ☐ 2. No ☐ 3. I don't remember ☐

6.12 If yes, what were the causes of the conflict? And how did you manage these conflicts?

_____

C. Management of conflict

6.13 Generally in conflicting situations related to CPRs, How the communities resolve these situations? Through; *Multiple responses possible. Please tick the appropriate box (es).*

1. Negotiation[1]	☐
1. Mediation[2]	☐
2. Arbitration[3]	☐
3. Adjudication[4]	☐
4. Not resolved	☐
5. "other" (specify)	

Note:

1. Discussion between two parties, working toward reaching agreement, without assistance
2. A voluntary process with an impartial third party helping disputing parties to reach a mutually beneficial agreement
3. Using an independent third party to settle a dispute; third party determines a binding settlement
4. Conflict is resolved using the justice system with judge &/or jury

(*Here, the interviewer has to probe how, when, by whom these situation is resolved and the outcome of the situation*)

6.14 On what conditions do communities use these tool(s) to solve these problems? *(hint for the interviewer, like the level of conflict whether it is escalated/more of violated or simple dispute among users*

2. Trends in Common-pool resource use and management

6.15 Going back over the past 10 years, Can you recall any changes in general availability (supply) of the CP resource system for the community?

_____

6.16 How do you see the degree of change in availability and your access to these resources?

1. Major increase ☐
2. Major decrease ☐
3. No change ☐
4. Minor increase ☐
5. Minor decrease ☐

6.17 If your answer for Question No 6.16 is major / minor decrease, what are the drivers of change *(Multiple responses possible. Please tick the appropriate box(es).*

1. Population pressure	☐
2. Unclear property rights	☐
3. Uncontrolled resource use pattern	☐
4. The existence of new market opportunities	☐
5. New technologies and development pressure	☐

6.18 Due to the impact of drivers of changes(population, Market etc) in the resource system;

6.18.1 exclusion from common-pool resources;	1. Increase	☐	3. No change	☐
	2. Decrease	☐	4. Un noticed	☐
6.18.2 In the volume or rate of use of common-pool resources;	1. Increase	☐	3. No change	☐
	2. Decrease	☐	4. Un noticed	☐
6.18.3 In the supply of common-pool resources given the level of demand	1. Increase	☐	3.No change	☐
	2. Decrease	☐	4. Un noticed	☐

3. Fish resource related

6.19 Do you or your family member engaged in fishing activities?

1. Yes ☐ 2. No ☐

6.20 If yes, how frequently perform fishing per month?

1. Daily ☐ 2. 2-3 days/week ☐ 3. Once a week ☐ 4. Once a month ☐
5. Sometimes during summer ☐

6.21 For what purpose do you fishing? For; *Multiple responses possible. Please tick the appropriate box (s).*

1. Subsistence (Home consumption)	☐
2. Commercial (Marketing)	☐
3. Recreational	☐

6.22 Around Lake *Tana*, in which places do you perform your fishing activities?

1. Around rivers and river mouths	☐
2. Near to the Lake boarder	☐
3. In the Lake	☐
4. Others (specify)……..	☐

6.23 What type of Instruments do you use for fishing?

_____

6.24 In a catch per unit effort, did you find what you are looking for in the fishing ground?

1. Yes ☐ 2. No ☐ 3. I don't know ☐

6.25 If no, what is happening with the fish stocks? Are they,

1. Increasing ☐ 2. Stable ☐ 3.Decreasing ☐

6.26 If decreasing, what are the causes? *Multiple responses possible. Please tick the appropriate box (s).*

1. Too many fishermen	☐
2. Overharvesting of fish	☐
3. Uncontrolled fishing gears and Instruments	☐
4. Uncontrolled fishing places, season seriously affected the juvenile	☐
5. Others (specify)…….	

6.27 As compared to the previous times, are returns from the fishery;

1. Increasing ☐ 2.Stable ☐ 3. Decreasing ☐

6.28 Which of these categories best describes your opinion to the statement," fish resource is being distributed equitably among the users"

1. Strongly Disagree ☐ 2. Disagree ☐ 3. Neutral ☐ 4. Agree ☐ 5. Strongly Agree ☐

6.29 If the answer to Q(6.28) is 1 & 2, what are the reasons for your disagreement?

_____

6.30 Comparing with the previous years, is the quality of life of the fishers and their families;

1. Improving ☐ 2. Stable ☐ 3. Worsening ☐

4. Knowledge and perception of the legislation, rules and regulation on fishery

6.31 Do you know whether there is fisheries Development, Prevention and utilization proclamation and Regulation or not? 1. Yes ☐ 2. No ☐

6.32 How do you perceive the existence of this proclamation?

1. Positive	☐	4. None of the above	☐
2. Negative	☐	5. No effect	☐
3. Both Negative & positive	☐	6. I don't know	☐

6.33 Are there any written bylaws (rules and regulations) that limit access to the resource system? Eg. Rules that limit the amount, timing and technology used to withdraw resource units

1. Yes ☐ 2. No ☐ 3. I don't know ☐

6.34 If the answer for Question No 6.33 is yes, How do you see the acceptance of these rules and regulations by the community

1. High ☐ 2. Medium ☐ 3. Low ☐ 4. I don't know ☐

6.35 If the answer for Question No 6.33 is yes, which of these categories best describes your opinion on the rules and regulations of resource use and management

1. I strongly support it	☐	4. I somewhat oppose it	☐
2. I somewhat support it	☐	5. I strongly oppose it	☐
3. I do not support nor oppose it	☐		

6.36 If the answer to Q (6.35) is 1 & 2, in what manner would you demonstrate this support? Under what conditions would you choose NOT to support?

_____

6.37 If the answer to Q (6.35) is 4 & 5, in what manner would you demonstrate this opposition? Under what conditions would you come to support?

_____

6.38 I consider these Rules and regulations to be efficient and transparent in managing CPRs

1. Strongly Disagree ☐ 2. Disagree ☐ 3. Neutral ☐ 4. Agree ☐ 5. Strongly Agree ☐

6.39 Please rate how well the institutional arrangements (rules and regulations) are clear & open to all users

1. Very poor ☐ 2. Poor ☐ 3. Medium ☐ 4. Good ☐ 5. Very good ☐

5. Wetland resource related

I. Farmers perception towards wetlands

What do you feel about the Wetlands in your localities?

6.40 I feel, wetlands should be used for cattle grazing to produce milk.

1. Strongly Disagree ☐ 2. Disagree ☐ 3. Neutral ☐ 4. Agree ☐ 5. Strongly Agree ☐

6.41 I feel, wetlands were not very useful except for the provision of materials for thatching and making crafts

1. Strongly Disagree ☐ 2. Disagree ☐ 3. Neutral ☐ 4. Agree ☐ 5. Strongly Agree ☐

6.42 wetlands played a vital role in groundwater regulation, flood control and other related benefits

1. Strongly Disagree ☐ 2. Disagree ☐ 3. Neutral ☐ 4. Agree ☐ 5. Strongly Agree ☐

6.43 All wetlands should be conserved and gazette so that they could be protected by law.

1. Strongly Disagree ☐ 2. Disagree ☐ 3. Neutral ☐ 4. Agree ☐ 5. Strongly Agree ☐

6.44 Wetlands are wastelands which could be put to better use.

1. Strongly Disagree ☐ 2. Disagree ☐ 3. Neutral ☐ 4. Agree ☐ 5. Strongly Agree ☐

6.45 Wetlands are the sources of Malaria, so that they should be drained and used for other

1. Strongly Disagree ☐ 2. Disagree ☐ 3. Neutral ☐ 4. Agree ☐ 5. Strongly Agree ☐

6.46 Do community members in your locality started to cultivate Wetlands (particularly for crop production)?

1. Yes ☐ 2. No ☐

6.47 If yes, when & how was the community members started cultivating/particularly for crop production/ the wetlands?

II. Management and governance of wetlands

6.48 Who is in charge of managing and governing these wetlands? *Multiple responses possible. Please tick the appropriate box (s).*

1. *Kebele* and *Wereda* Administrators/ leaders at grassroots level ☐
2. Office of Agriculture and RD and Environmental Authority & Land Admin ☐
3. Elected Community members ☐
4. Some Powerful group (The wealthy group) ☐
5. No one is in charge ☐
6. Others (specify)…… ☐

6.49 Do you think that, the present management and governance regime is fair, efficient and promote sustainable use of wetland resources? 1. Yes ☐ 2. No ☐ 3. I don't know ☐

6.50 If your answer to **Question No 6.49** is No, in your opinion, who should manage and govern the wetlands to promote sustainable use?

_____

6.51 Is there any written and unwritten by-laws restricting agricultural use of wetlands in your localities?

1. Yes ☐ 2. No ☐ 3. I don't know ☐

6.52 If yes, who is in charge of enforcing these bylaws? *Multiple responses possible. Please tick the appropriate box (s).*

1. *Kebele* and *wereda* leaders/administrators at grassroots level	☐
2. Government officials at different hierarchy (Office of Agriculture &RD and Environmental Authority & Land Admin)	☐
3. Justice at different level of Administration	☐
4. Police or "Militia"	☐
5. Elected Community members	☐
6. Religious leaders	☐
7. No one is in charge	☐

6.53 Is there any, customary laws, practices, tenure systems and institutions of indigenous and local communities, which promote sustainable use of wetland resources?

1. Yes ☐ 2. Yes they were but they didn't exist today ☐ 3. No ☐ 4. I don't know ☐

6.54 If your answer for the above Question is 1 & 2 Please describe in details

_____

6.55 Are wetlands in your locality converted into other forms?

2. Yes ☐ 2. No ☐ 3. I don't know ☐

6.56 If yes, which human activity is most threatening to the wetland ecosystem?

1. Drainage related to health	☐	4. Construction	☐
2. Conversion to crop land	☐	5. Excessive grazing	☐
3. Unplanned investment	☐	6.. others (specify---------	

6.57 Finally, in order to use, protect and govern CPRs sustainably, what should be done? What should be the roles of the Government, Community and other stakeholders?

Thank you for your patience!!!

Appendix 5: Focus group discussion and key informant interview checklist

The following checklists were used for group discussion and key informant interview. Discussion questions asked of group discussant and key informants are listed below. Due to the flow of discussion or time limitations, all questions might not have been asked in each and every discussion and new issues that come out from the discussion were also discussed.

A. Overall assessment of CPR use, management and governance

- What are the major threats of CPRs (particularly Lake *Tana*, fishery and wetlands) in your locality?
- What are the major driving forces that affect the trends and dynamics of CPRs in the sub-basin?
- Are members of the community competing with one another to maximize their individual 'take' from the commons? Who else is involved in resource capture?
- Do resource users face a high level of uncertainty over CPR access and availability and are they highly dependent upon the resource with limited livelihood options which would provide an incentive for low compliance with rules and non-conforming behavior?
- Have total catches been falling over time?
- Is catch per unit effort increasing or decreasing?
- What is happening with the fish stocks?
- Are they increasing, stable or decreasing?
- Are returns from the fishery increasing, stable or decreasing?
- Are they being distributed equitably among the users?
- Is the quality of life of the fishers and their families improving, stable or worsening from previous years?
- Are there geographical boundaries for the fishery? How are they defined?
- Are there restrictions on who can enter the fishery? How are they defined?
- Are there any other boundaries relevant to the exploitation of fishery? What are they?

B. Conflict assessment

- What conflicts exist at present in relation to CPRs?
- What conflicts are not yet visible, but might arise in the future?
- What are possible reasons for conflicts over resource use, management and governance?

If a conflict has been identified in certain localities:

- How did the conflict arise?
- What issues/interests does the conflict concern?
- How long has it been going on?
- Is conflict increasing or decreasing in the past 10 years?
- Who is involved in these conflicts?
- What are their interests in the conflict?
- What kind of official and/or traditional power do they have?
- What are historical relationships between conflicting groups in the sub-basin/districts or *kebeles*?
- Can the groups work together at all? Why or why not?
- Can the problem be solved internally or amongst groups without external assistance?
- Are outsiders tolerated?
- How can an outsider be involved to (re)solve the conflict?
- What kind of outsider?
- How can solutions/resolutions be made sustainable?
- Are written agreements sufficient?
- Are there also other optional 'solutions'?
- How frequently conflict among resource users aroused?
- Are conflicts over CPR more prevalent in the past 10 years?
- In conflicting situations related to CPRs, How the communities resolve these situations

C. Institutional arrangement and resource governance

- Who owns and control common-pool resources (Lake *Tana*/water, Fish & wetlands)?
- What is the role of local government on CPR management and governance?
- Who is eligible to make decisions in CPR use, management and governance issues?
- What actions are allowed or constrained? And what procedures must be followed?
- what payoffs will be assigned to affected individuals
- What are the main characteristics of the leadership? Are the leaders considered legitimate? And how are decisions taken eg. Consensus, majority?
- What are the formal and informal rules on access and withdrawal rights to CPRs?
- Are there any written bylaws (rules and regulations) that limit access to the resource system?
- Are the existing formal institutional arrangements effective in governing natural resources in general and CPRs in particular?
- What about the traditional resource management and governance systems?
- What boundary conditions (social, economic, physical, legal) apply to the regulation of?
- What are the main factors determining the way in which decisions are made for operational and collective choice rules?
- How decisions are made (consensus/majority/autocratic)?
- Which types of decisions are made through consensus/majority/autocratically
- Are all stakeholders represented in the decision-making process and how?
- What is the level of participation of user groups/stakeholders in the decision-making process?
- Are women and youths represented and how?
- What are user and stakeholder attitudes/values towards decision-making processes?
- What are user and stakeholder attitudes/values towards rule-breaking?
- How much legitimacy do the rules and regulations have with users?
- How are formal and informal rules enforced? What sanctions are used?
- How do users perceive the utility of the rules?
- What resources are available for monitoring and enforcement rules and regulations?