EC-JRIF Ethiopian e-journal For Research and Innovation Foresight

Vol 5, No 2 (2013) -PP (32-53)

Exploring governance of Lake Tana fishery: Interactive perspective on governance

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Abstract

This study focuses on exploring an overview of the status and governance problems of Lake Tana fishery sector. Using household survey, focused group discussions, key informant interviews case studies, stakeholder identification and analysis workshop; it has shown that there were no legally binding rules that govern fisher's and other stakeholder's behavior at user level. Though fishery proclamation and regulation were enacted at Federal and Regional level, directives to enforce proclamations at the user level are not yet prepared. Whereas stakeholder identification and analysis reveals that, Bureau of Agriculture, Bureau of Environmental Protection Land Use and Administration and Bureau of Water Resource, ranked high on stake value-power level and totaled the highest score. They had a particularly strong and legitimate claim to govern the fishery sector. Above all, the power to control and monitor the fishery resource management and governance was vested to Bureau of Agriculture. However these stakeholders were not working synergistically and discharging their responsibilities to resolve the fishery governance problems. As a result too much fishing pressure and illegal fishing activities were believed to be causing overexploitation of endemic fish stocks, threatening sustainable fish production, marketing and the livelihood of local fishermen. Therefore enacting legislations at the constitutional level could not be a panacea to protect the fish resource from depletion; rather the process of rule making should be participatory to understand the local context, rules and regulations should be integrated with the local institutions and it has to be communicated with relevant stakeholders in the action arena.

Key words: Governance, institutions, stakeholders, fishery, Lake Tana, Ethiopia

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1. Introduction

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 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 and poverty reduction in rural areas, and is now considered an integral part of rural and agricultural development policies and strategies in Ethiopia.

Even though there is no, specific 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. As reported by ACP (African, Caribbean and Pacific Group of states) Fish II project, currently the bulk of the fish catch originates from 4 lakes, namely: Lake Tana (25%), Ziway and Langano (19%), Chamo (18%) and Abaya (12%) of the national total production. 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 (ACP, 2012).

Lake Tana is the largest freshwater body in Ethiopia, which covers 50% of the total inland water bodies in the country. It is an important source of fish both for the people immediately around the lake and elsewhere in the country (Awulachew *et al.*, 2009). Lake Tana contributes 20-31% of the total fish potential of the country and is used for commercial fishing (Wondie, 2010). Though, fishing in Lake Tana is believed to be started around 18th century by the *Negede woyto* community, modernization of the fishery sector started recently. Commercial fishery in the Rift valley started in the 1950s, where as in Lake Tana it started very late in the 1980s.

Research efforts with regard to the biological, abundance and marketing aspects of Lake Tana fishery have been done for the last two or three decades. But they were inadequate to illustrate the human-nature interaction and the trends in resource degradation and anticipate possible solutions especially in reference to institutional arrangements and fishery resource governance. The governability of this sector is however not recognized by the potential stakeholders in the subbasin. Governance in fisheries is usually understood as the sum of the legal, social, economic and political arrangements used to manage fisheries. It has international, national and local dimensions. It includes legally binding rules, such as national legislation or international treaties as well as customary social arrangements (FAO, 2005-2012). Governance however 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, Kooiman *et al.*,2005). It is an

ongoing social process that is constantly negotiated and achieved among relevant stakeholders (Wilkes, 2005).

In recent time, interactive governance has become an important approach for understanding multilevel governance issues in natural resource management and governance in general fisheries and coastal governance in particular. 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 (Jentoft, 2007). The integrated and comprehensive lens that the interactive governance perspective brings to the concerns, challenges and problems related to fishery resource 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 fishery governance (Chuenpagdee, 2011). Hence, a fisheries governor aiming to put governance into action should first examine the governability of the fishery" (Mahon *et al.* 2005)

Therefore, this research was designed to critically analyze and understand the system to be governed (fishery sector, local community and other stakeholders), the power and interests of multi-stakeholders in fish resource governance, the governing systems (the governors and the rules of the game) and the governance interaction (realities on the action arena). The study focuses on status of fish resource, stakeholder involved, institutional framework that support the fishery sector and the knowledge and perception of stakeholders towards the rules and regulations.

2. Research Methodology

2.1 The study area: Lake Tana

At 12°N, 37°15′E, and 1,830 m altitude, Lake Tana is situated on the basaltic plateau of the northwestern highlands of Ethiopia. It is the largest freshwater lake in the country and the third largest in the Nile Basin which contributes about 85% of the Blue Nile water. It covers an area of 3,050 km². The catchment area of the lake at its outlet is 15,321 km² of which about 20% is covered by the lake itself. More than 40 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 m³s⁻¹ (i.e. 4,986 Mm³y⁻¹). The mean annual outflow is estimated to be 119 m3s-1 (i.e. 3,753 Mm³y⁻¹) (SMEC, 2008). 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.

2.2 Research Methods

In order to acquire the data in regarding research questions, primary, secondary, qualitative as well as quantitative techniques of data collection techniques were applied. Data for this study were drawn from five main sources: (a) a set of case studies conducted in selected fishery cooperatives; (b) Households survey (c) in-depth key informant interview and series of focus group discussion (d) a documentary analysis and (e) stakeholder identification and analysis workshop. The study adopted mainly a qualitative research methodology, and employed semi-structured interviews and Participatory Rural Appraisal (PRA) methods (key informants, semi-structured interviews, informal group discussions, focus group discussions). Following 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. Historical trend analyses of major changes in the fishery sector were used.

3. Results and Discussion

3.1 The system-to-be governed: fishery sector and its stakeholders

Socio-economic features of the community

The Amhara National Regional State (ANRS) is one of the 9 ethnically based administrative regions of Ethiopia. The mainstay of the regional economy is agriculture, characterized by subsistence crop production. Next to farming, animal husbandry is the most important activity in most agro-ecological zones of the region. The socio economic conditions are characterized by low GDP per capita and high levels of illiteracy. 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 (WME, 2009).

The household survey result shows that 50% of the sampled households are illiterate and almost 67% of the sampled households are dependent on crop and livestock production as a primary livelihood source. More than 20% of the respondents are engaged in an integrated crop, livestock and off farm activities as a form of livelihood. The other livelihood options include crop integrated with fishing, wood collection, and charcoal production. Fishing around Lake Tana and other water bodies in the region is increasing in importance and consumption with an estimated annual off-take of 20 thousand tons.

The lake fishery has employed more than 4,500 persons who are directly dependent on the major activities of fishing, marketing, and processing for their livelihood. It is also contributing in giving employment opportunity to women and other landless people like ex-soldiers other than the fishers. There are also about 5,800 occasional fishers who fish for house consumption (Eshete, Unpublished). With the advent of dramatic population growth, all land based resource scarcity becomes a critical problem for the rural land tillers. Every new family demands land for cultivation. However, unless they do inherit from their parents, it is not easy to access land. Therefore, 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.

A typical household in the study area owned 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. Households in the study area are predominantly male headed (77%) with a fewer than (23%) of headed by female. The majority of female head were either divorced (30.4%) or widowed (45.7%). The remaining 23.9% of the female head were married or re-married women who have their own land and lead their family. The minimum and maximum number of family members in the household was 1 and 12 respectively. The Average household size is 5 persons per household which is greater 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 predominant ethnic group 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 of Lake Tana shore.

Characteristics	Number	Percentage		
Sex				
Male	154	77.0		
Female	46	23.0		
Level of education				
Illiterate, no schooling	99	49.5		
Adult Education	53	26.5		
Grade 1-4	27	13.5		
Grade 5-8	16	8.0		
Grade 9-10	1	0.5		
Other(Religious-priests)	4	2.0		
Primary livelihood source				
Crop+ Livestock production	134	67.0		
Crop+ livestock +off farm	41	20.5		
Crop+ Fishing	7	3.5		
Crop production	13	6.5		
Livestock production	5	2.5		

Table 1: Socio-demographic characteristics of the respondents (N=200)

Source: Own survey result, 2011

The Negede Woyto community and history of fishing in Lake Tana

The *Negede Woyto* community is considered to be an indigenous people around Bahir Dar, and the southern shore of Lake Tana. Members of this community are also residing in the North and South Gondar zones adjacent to Lake Tana. The community Elders claimed that their descendants

were originally from Egypt. According to the 1994 national census of Ethiopia, the population of the *Negede* was estimated 1,677 but they are not mentioned in the preliminary report of the 2007 census. Currently, they predominantly live in kebeles 03, 11(Abay 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 inferior group in the society and the other community groups look down and exclude them. They claim themselves as Muslim but the Muslim community does not recognize and accept them as a member of Muslim 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. 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/indigenous skills and tools passed from generation but they do not enable them to be competent and secure enough income for better life (Care Ethiopia, 2011).

Fishing in Lake Tana believed to have been started around 18th century by the *Negede woyto* community and then other poor members of the communities gradually adapted 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). The fishermen, limited in their mobility, only had access to the shore areas, using locally made fish traps, hooks and small gillnets (15–20 m).

In 1986 motorized boats and modern, nylon gillnets were introduced as part of the Lake Tana Fisheries Resources Development Program(LTFDP) which was initiated by the Ethiopian Ministry of Agriculture, the Ethiopian Orthodox 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 tons in 1987 to 360 tons in 1997 (Wudneh, 1998). Despite the fact that they pioneered to Lake Tana fishery, for unknown reason the *Negedo woyto* community have not participated in the process of modernizing the fishery sector in the study area. They were excluded from participating in fishery cooperatives.

Time period	Predominant fishers	Types of technologies used	Fishing ground	Rules and regulations of fishing
Before 1986	The <i>Negede</i> <i>woyto</i> community	-Reed boat -Local fish traps and hooks -Poisonous plants	Limited to the Lake shore areas	Informal/customary social arrangements/ self governed institutions
Between 1986- 2003	-Negede woyto -Modern fishers	Modernized boats and nylon gill nets	-Lake shore areas -Deeper offshore waters -Distant river mouths	There was 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 But not yet implemented No directive since then

Table2: Major changes in Lake Tana fishery

Source: Own survey result, 2011

The status of fish resource: Declining trends in fish stock and production

Over recent years fish demands has grown significantly and the food habit of the population has been also changed. As a result, fishermen are motivated to harvest more fish to fetch a good price. The introduction of new fishing technology 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 in 1980s, there has been a temporary rise in the yield. But gradually as the fishing pressure increases, fish production is decreasing. Moreover, if fishing continues to be intense at the time of spawning, the fish populations are expected to decrease rapidly. Members of the Tana haik No.1 fish cooperatives also reported that in the past 7 years, fish production and marketing has been declining (figure 1). As a result, they are struggling to secure and sustain their livelihood. Those who are not able to cope up with the situation, they are planning to leave the sector and searching for other livelihood options such as sand mining and casual labor in the nearby towns (Bahir Dar, Gondar, Woreta etc). Too much

fishing pressure is believed to be causing overexploitation of fish stocks and threatening the livelihood of the local fishermen.

In general, after the introduction of more efficient gillnets compared with traditional fishing gear, unregulated fisheries have had severe impact on the stocks of the Lake and rivers in spawning, lake-dwelling cyprinids (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% in 10 years time (1991–2001). With the advancement of the fish sector in the last two decades, it can be imagined what is happening to the fishery resource in the past 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 is still going on which ultimately resulted in the loss of some fish species and extinction of 7 of the 15 endemic *labeobarbs*.



Figure 1: Trends of fish production and marketing (2002-2009) Source: Calculated from Tana Haik No.1 fishing cooperative data sheet, 2011

Who has a 'stake' and 'power' in Lake Tana fishery sector governance?

The word "stakeholder" was first recorded in 1708 as "a person who holds the stake or stakes in a bet" (Ramirez, 1999). Freeman (1984) defines a stakeholder as "any group or individual who can affect, or is affected by, the achievement of corporation's purpose. The understanding of stakeholders' involvement in the Lake Tana fish sector is an important step in bringing them into governance, using their competencies and capacities as necessary, and ensuring they are heard and have influence (Bavink *et al.*, 2005). This section depicts the stakeholders' landscape that evolved from stakeholder identification and analysis workshop which was carried out by a multidisciplinary team of experts from different stakeholder group (governmental, research, academic and NGOs).

Based on the mandate and responsibilities given by the Law of the Land (The Ethiopian Constitution), international treaties and customary laws of the specific community in the jurisdiction of Lake Tana Basin, stakeholders that have an interest in and influence over fish resource use, management and governance were identified, their stake values and power levels were assessed and evaluated. However, this identification cannot guarantee the exhaustive lists of stakeholders in the Lake Tana's jurisdiction. Because, stakeholders can change over time, new stakeholders can enter a resource management and governance system, while others may lose their role or interest (for instance the *Negede woyto* community). The assessment is based on the assumption that under complex and very dynamics systems, stakeholder's stake value and power level may be changed at any point in time, so that the current assessment is only representing the existing scenario. Accordingly, the nature of their mandate or interest, the bases of their stake, the stake value and the power level to take action can be also more dynamic in the wake of resource scarcity undetermined demand for those resources, a dynamic institutional and structural adjustments.

Policy analysts have long been aware of the importance of interest groups in the policy process; 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, 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).

Stakeholders have very different degrees of power to control decisions that have effects on policies and institutions, and they have different degrees of 'potential' to contribute, or 'importance', to achieving a particular objective. As indicated in table 3, a high score on both variables (stake value and power level) will make them a clear candidate for becoming involved in the fishery 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 level of stake value and high power to secure their stake (eg: Bureau of Agriculture) are likely have an extreme impact on the management and governance of the fishery sector. However, even when a stakeholder places a high value on their stake (whether positive or negative) but has a low power level to secure the stake in the resource system may not serve their interests. (eg. Youths). Conversely, a more

influential stakeholder with perhaps only a moderate interest in a particular outcome may still have greater power to secure this outcome (eg. Institute of Biodiversity Conservation and Research).

No	Stakeholder	Nature of the stake	Stake	Power	Total	Impact on
			value	level		CPRs
1	Bureau of Agriculture (BoA)	Regulation/Administrative	5(+)	6	30	Higher
2	Bureau of Water Resource (BoWR)	Regulation/Administrative	5(+,-)	5	25	Higher
3	Administration (Local to Federal)	Regulation/Administrative	4(+,-)	6	24	Higher
4	Bureau of Env. Prote. Land Use and Administration (Bo-EPLUA)	Regulation/Administrative	5(+,-)	4	20	Higher
5	Ethiopian Wildlife Dev. and Conservation Authority (EWDCA)	Regulation/Administrative	3(+)	5	15	Medium
6	Local Community	Livelihood/Cultural value	5(+,-)	3	15	Medium
7	Fishers	Livelihood/Cultural value	5(+,-)	3	15	Medium
8	Academic and Research Institute	Knowledge generation and transfer	3(+,-)	5	15	Medium
9	Institute of Biodiversity and Conservation	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 making	4 (-,+)	3	12	Medium
14	Youths groups	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 making	4(-,+)	2	8	Low
17	Private Investors	Economic/Profit making	4(-)	2	8	Low
18	Boat Owner	Livelihood/Profit making	4(+,-)	2	8	Low
19	Lake Tana Transport Enterprise	Economic/Profit making	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

Table 3: Stakeholder analysis of fish resource management and governance in Lake Tana sub-Basin.

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 was 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 use, management and governance.

<u>Stake Value</u>	
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

Accordingly, Bureau of Agriculture (BoA), Bureau of Environmental Protection Land Use and Administration (Bo-EPLUA), Bureau of Water Resource (BoWR), and Administration (from national to local level) had a particularly strong and legitimate claim to govern the fishery sector in Lake Tana subbasin, because they ranked high on stake value-power level assessment and totaled the highest score. At the same time, stakeholders like Ethiopian Wildlife Development and Conservation Authority (EWDCA), Local community, fishers etc, had a medium impact on the governance system. This implies that, this information proved particularly useful in the policy and planning process, especially as a way to convince other stakeholders that the rights, responsibilities and accountability of these stakeholders had to be respected, monitored and integrated into the management and governance system.

Even though they possess high interest in and low power on fishery governance, local communities, fishers, and youths residing near to Lake *Tana*, who have the *de jure* ³ and *de facto* rights or claims over using and managing the CPRs are the most important stakeholders to the resource system. Their interests in fishery 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 fish resource. Therefore, their customary and ownership rights also helped them to own and/or access these resources.

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 the stakeholder has. For example, Bureau of Agriculture (BoA) has been vested a power by the supreme law 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 national 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. It is responsible for the management of land, forest, wildlife and biodiversity resources

³ *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.

(Proclamation No. 110/2007). The supremacy of the constitution as fundamental principle states that all international agreements ratified by Ethiopia are an integral part of the law of the land (Article 9 (4). Therefore, implementing agencies of the international treaties are also parts of the governance system. Therefore, international stakeholders such as FAO and UNESCO can affect fish resource management and governance through their interests in issues like ecosystem and biodiversity conservation. Basically their power over the resources is driven by their financial capital, international agreements and conventions that individual countries ratified.

3.2 The governing System: The rules of the game and the governors

The policy, legal and institutional framework of the overall Ethiopian Natural Resource management and governance system comprises: The systems 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. The Federal Democratic Republic of Ethiopia (FDRE) Constitution is the supreme law of the land that governs all laws in Ethiopia. As a result, a number of proclamations and supporting regulations were 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. However, despite the existence of proclamations and regulations at national and regional level, there is no specific policy framework and directives which addresses the fishery resource and to enforce enacted proclamations and regulations. The broad natural resource policy of the country is serving as an umbrella of the other specific resources.

3.2.1 Institutions governing fishery resource

The Lake Tana Sub-Basin fishery administration and governance is characterized by 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 in 1986 compared with traditional fishing gear, unregulated fisheries and an increasing number of fisherman have had severe impact on the fish resource in the Lake Tana and its tribute river mouths. As the number of fishermen and motorized/reed boat increases, competition and conflict over the fish resource also increased which ultimately led to decline of the fish stock (both in species and abundance). The existing broad institutions governing the natural resource were not in a better position to tackle fish resource degradation, depletion, minimize and/or prevent conflict among stakeholders, and secure sustainable livelihoods for the local fishermen and 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 national 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 national policy, but has an additional objective relating to the creation of employment opportunities in fishing communities. After three years, Regulation No. 50/2007 was enacted to enforce the Fisheries Resource Development, Protection and Utilization Proclamation.

Concerning environmental protection, both proclamation states 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 institution established around in any basins found in the region will not bring damage on the basin, the fisheries resource and all things in the water.

On the contrary, during the time of this study there was no limitation on the number, type of gill nets and fishing technology used. Because, directive to enforce the proclamation and regulations were not yet prepared and implemented at a regional level. There is no formal rule 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, an illegal fishing nets with less than 8cm are being introduced from Sudan and causing a rapid depletion of the fish resource. Until the time of this survey, there was no initiatives from the concerning bodies to control the situation.

3.2.2 The governing bodies

The House of Peoples' Representatives (HPRs) is the highest legislative authority in all matters (including natural resource governance) assigned by the Ethiopian constitution. With regard to natural resource governance, the HPRs, are given power to enact laws on the utilization of land and other natural resources (presumably fish resource), of rivers and lakes crossing the boundaries of the national territorial jurisdiction or linking two or more States; Article 55 (2) (a). The Ministry of Agriculture (MoA) is the principal ministry for fisheries and other aquatic life issues including the Institute of Ethiopian Agricultural Research (IEAR), Environmental Protection Authority. The Ministry is

responsible for the development and management of the fisheries and IEAR undertake research in response to fisheries management and development needs. The Federal system of government in Ethiopia use regional Fisheries Experts in the Regional Governments with significant fisheries. Though not effective, at the user level members of fishers co-operatives are also charged with local decision making in fisheries and these co-operatives form the community-level basis of collaborative fisheries management in their respective jurisdictions.

3.2.3 Modes of fishery governance in Lake Tana sub-basin

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 conventional governance mode, 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 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).

Prior to the introduction of modern/commercial fishery in Lake Tana, traditional self governance were purely the dominant governance mode over the hierarchical (centralized) and co-management. The Negede woyto community was the dominant fisher where they used to govern the fishery sector traditionally. Management authority and decision-making power rest within 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 have been started, where organized fishery cooperatives and Bureau of Agriculture (BoA) share co-governance responsibilities. 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 is trying to change the governance mode and structure into hierarchical. Even though, it is not implemented yet, they are trying to impose the Fishery Development and Utilization Proclamation and its regulation in to the fishery sector, so that BoA vested the power to control and monitor the overall fishery activities in the 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 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, fishery inspector was not assigned and directives were

not prepared. And yet, the transition from the co-governance to hierarchical mode of governance became a long process which made the fishery sector unprotected and uncontrolled.

3.3 Realities on the action arena: The governance interaction

Governance interaction between the systems to be governed (in this case fishery sector and its stakeholders) and governing system (the rules of the game and the governors) takes place at different level of the governance hierarchy spanning from the constitutional to the operational level at grassroots level. The process inquires to what extent the governing system is interacting with the system to be governed to insure the sustainable fish resource use, management and governance.

An examination of the relationship between the condition 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 structures and non participatory policy and rulemaking process hindered a smooth relationship and plausible communication between the governing system and the system to be governed. Despite, the enactment of proclamation and legislation in 2003 at national and regional level, it took 3 years to endorse the regional regulation in 2006. And yet, there is no implementation directive to execute the rules and regulations at user level. It delayed for 3 years and in 2007, the Regional Parliament approved the Regional Fisheries Guideline. At a national level, guidelines have now been developed and submitted to the council of Ministers. It is surprising that it is still not endorsed at a Federal level where it affected the timely development of the Amhara Region Guideline.

3.3.1 Fish resource access and withdrawal right

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). 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 ground on formal laws (Crewett *et al.*, 2008). The Ethiopian government is following a public trust doctrine, a legal principle dating back to Roman law in which 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 premises the FDRE Constitution, which is considered as the supreme law of the Land (Article 40) vested an exclusive power of right to ownership of rural and urban land as well as all natural resources presumably including water, fish and wetlands to the state and the Ethiopian people. Constitution 1995 Article 40 (3) states that;

"The right to ownership of rural and urban land, as well as of all natural resources, is exclusively vested in the State and in the peoples of Ethiopia. Land is a common property of the Nations, Nationalities and Peoples of Ethiopia and shall not be subject to sale or to other means of exchange".

In addition, according to the regional Fishery Regulation for commercial fishing every fisherman has to have a fishing license to access and harvest the fish resource. 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). 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. However, any person dwelling nearby a water body have the right to capture up to 3kg fish using a single hook for his personal or household consumption without license provided that he/she may not avail same to market and sell (Article 6/3). The concept of "bundles of rights" as it is developed by Schlager and Ostrom (1992) is useful for our purpose to analyze the 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.

	1 5 0		5			
Level of right	Property right	Stakeholder Group				
		The State	Local community	Organized commercial fishers	Private	Others (NGOs)
Operational	Access				$\sqrt{*}$	$\sqrt{*}$
	Withdrawal	\checkmark	$\sqrt{**}$	$\sqrt{*}$	$\sqrt{*}$	$\sqrt{*}$
Collective	Management				×*	×*
choice	Exclusion		×?	×	×	×
	Alienation		×	×	×	×

Table 4: Property right issues for fishery resource in the Lake Tana Basin

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

Key

 $\sqrt{-}$ Permitted

 $\sqrt{*}$ - Access and/or withdrawal of fish resource is allowed if and only if the stakeholders have a license

 $\sqrt{**}$ - Withdrawal is permitted without license only for household consumption up to 3kg per day

×? - In some cases communities may have the right to exclude others (except the government) from their commons

×*- In some cases stakeholders may be involved in management process up on the request of the State and the community

×- Not permitted

Ethiopian constitution explicitly states that the Ethiopian people and the state have exclusive right to ownership of the rural land and other natural resources presumably fish. However, except access and withdrawal rights, local community has no full ownership right on fish resource. Whereas, the State posses a full 'bundles of right' and alienation, the right to sell or lease management and exclusion rights is solely vested to the State.

The reality however is, despite the existence of the rules of the game (property right rules and proclamation/regulation) there is no restriction on access and harvesting of the resources at the user level. Therefore, every potential fishermen can access and harvest at any time, using any type of fishing gear, as he/she wish. Every fisherman is tempted to overharvest and exploited 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, livelihood of fishermen are severely challenged, fish production and marketing activities of fish cooperatives were decreased drastically, competition and conflict over fish resource also increased. In recent times, the characteristics of common pool resources entitlement and inefficient rule enforcement also give incentives for many youths entering into the fishing sector as an option for their livelihood. In addition, investors are more interested on aquaculture investment in the Lake Tana fishery sector. And yet, Bureau of Agriculture who is given the responsibility to handle the overall governance of the fishery sector is not finalized preparation to start licensing of fishers and management of the resource.

3.3.2 Knowledge and perception of the 'rules of the game'

For equitable, effective and efficient resource management and governance, all the various stakeholders must be part of the decision making and management processes. 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 actors (Ostrom *et al.*, 1993). Governance rules and regulations must be clear in nature and seen as appropriate by local stakeholders (Fisher *et al.*, 2010). Stakeholders can only be confident about the reliability of the resource governance process if they know what is going on their commons. As quoted by the famous Scientist Albert Einstein, 'knowing and understanding the rules of the game will help the stakeholders to play their roles better than anyone else in their respective action arena'.

Yet, decisions which govern the use of fisheries resources 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, resource users are not well informed about and aware of the fishery proclamation and regulation. At the user level almost 95% of the respondents do not know the presence of proclamation and/or regulations. Surprisingly, from the sampled experts at district level, more than 87% were not even aware of these proclamations and regulations. This implies that, once the rules regulations enacted at 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 to existence) were not participatory to involve all parties in the fishery governance system.

Knowledge of proclamation	District expe	erts (N=15)	Users (N=200)		
and/or regulation	Frequency	Percent	Frequency	Percent	
Yes	2	13.3	11	5.5	
No	13	86.7	189	94.5	
Total	15	100	200	100	

Table 5: Knowledge about fisheries development prevention and utilization proclamation and regulation

Source: Own survey result, 2011

Perception of resource users about the rules of the games that govern these resources could affect the management and governance of fish resource 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 management and governance. Therefore, Community members were asked to evaluate how well the existing institutional arrangements (property right 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 the primary users of the CPRs were agreed that the current institutional arrangements are 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.

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 fish, wetland and grazing land encroachments. First they will be judged by the community and local administrations. If they admitted not to repeat the same mistake, 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 villages or districts people who have a strong affiliation with administrators were allowed to cultivate common pool resources such as wetlands, even they were not given warning to stop their wrong doings. As a result, community members were confused of the administration procedures and for whom these rules and regulations are applied or not applied.

In summary, major challenges of Lake Tana fishery are:

- Uncontrolled overfishing and loss of endemic species
- Illegal fishing activities (Mesh size less than 8mm is used)
- Importation of Illegal fishing gear from Sudan
- Lengthy law making process to protect the declining stock of fishery resource
- Stakeholders' poor knowledge and perception of legislations, proclamation and their derivatives
- Mandated agencies not discharging their responsibilities (Bureau of Agriculture)
- Weak institutional framework to guarantee sustainable fish resource management and development

4. Conclusions and the way forward

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. The governance interaction has to come up with a positive outcome in order to guarantee the sustainable fish resource use, management and governance. However, if one has to ask at a glance, whether the present-day natural resource governance system of Ethiopia is appropriate for the current and anticipated future developments in Lake Tana basin or not?. The likely answer is 'no'. Because, though there are rules and regulations enacted at constitutional and collective choice arena, the implementation and enforcement of these rules and regulations at the user level is not as such satisfactory. Formal laws were enacted without considering the local context where community bylaws operated and even without the consent and consciousness of resource users. On the other hand traditional resource management and governance institutions are losing ground to effectively manage local level resource systems.

Proclamation and regulation for fisheries resource development, protection and utilization were enacted at national and regional level. However, most of the resource users and experts at a grassroots level were not aware of the existence of these rules and regulations. 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. Though the power to control and monitor the fishery resource management and governance issues were vested to Bureau of Agriculture, the Bureau is not discharging its mandates and responsibilities as early as possible.

Therefore, for a controlled development and proper management and governance of the expanding Lake Tana fisheries, enacting legislation and its enforcement (regulation) at the constitutional level could not be a panacea to protect the fish resource depletion; rather the process of rule making should be participatory, it has to be communicated with actors in the action arena (where rules interact with actors to come up with certain outcomes) and the legislation has to be enforced at the user level. Legal instruments should also lay out the procedures that must be followed by public agencies to identify and allocate rights and responsibilities within specific management instruments and agreements. Organizing local level users association with their own bylaws (crafted by them for themselves), with a minimal outsider (government, NGOs) support is imperative for sustainable fish resource production and conservation.

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