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THE ROLE OF SOCIAL CAPITAL IN WETLAND RESOURCE CONSERVATION: THE CASE OF SMALL ABAYA LAKE SILTIE ZONE, SOUTH ETHIOPIA

MSC RESEARCH THESIS

BY

Mohammed Essa

June, 2017

Wondo Genet

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MSC RESEARCH THESIS

SUBMITTED TO THE SCHOOL OF NATURAL RESOURCE AND ENVIRONMENTAL STUDIESWONDO GENET COLLEGE OF FORESTRY AND NATURAL RESOURCES HAWASSA UNIVERSITY, ETHIOPIA

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MAIN ADVISOR: TESHALE W/AMANUEL (PhD)

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ETHIOPIA

APPROVAL SHEET – I

This is to certify that the thesis entitled ‘‘***THE ROLE OF SOCIAL CAPITAL IN NATURAL RESOURCE CONSERVATION: THE CASE OF SMALL ABAYA LAKE, SILTIE ZONE, SOUTH ETHIOPIA***.*”*is submitted in partial fulfillment of the requirements for the Degree of Master of Science in ***Natural Resource Economics & policy***, Wondo Genet College of Forestry and Natural Resources, and is a record of original research carried out by Mohammed Essa under my supervision, and no part of the thesis has been submitted for any other degree or diploma. The assistance and help received during the courses of this investigation have been duly acknowledged. Therefore, I recommend that it can be accepted as fulfilling the thesis requirement.

_____ _____ _____

Name of Major Advisor Signature Date

_____ _____ _____

Name of Graduate ProgramCoordinator Signature Date

Approval Sheet-II

We, the undersigned, members of the Board of examiners of the final open defense by Mohammed Essa have read and evaluated his thesis entitled ‘‘The Role of Social Capital on Natural resource conservation: The Case of Small Abaya Lake &Its Surrounding, South Ethiopia” and Examined the candidate. This is, therefore, to certify that the thesis has been accepted in partial fulfillment of the requirements for the Degree of Master of Science in Natural Resource Economics & Policy.

Name of the Chairperson	Signature	Date
Name of Major Advisor	Signature	Date
Name of Internal Examiner	Signature	Date
Name of External Examiner	Signature	Date

Declaration

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university and that all sources of materials used for the thesis have been duly acknowledged.

Declared by: Mohammed Essa

Signature_____

Date_____

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Abbreviations

CBCPCRM Community Based Common Pool Resource Management

CC Contingency Coefficient

CPR Common Pool Resource

CVM Contingent Valuation Method

FGD Focus Group Discussion

Ha Hectare

KIIKey Informant Interview

M.a.s.l. Mean above sea level

MoARD Ministry Of Agriculture& Rural Development

ARDOAgriculture and Rural Development Office

SPSS Statistical package for social science

SSA Sub Saharan African Countries

BOARD Bureau of Agriculture and Rural Development

VIF Variance Inflation Factor

THE ROLE OF SOCIAL CAPITAL IN NATURAL RESOURCE CONSERVATION: THE CASE OF SMALL ABAYA LAKE, SILTIE ZONE, SOUTH ETHIOPIA

Abstract

Wetland ecosystems as natural resource are the most diverse and productive ecosystems on earth that support livelihood strategies, such as fishing, agriculture,craft materials, clean drinking water and medicinal plants. Inmany part of however, developing countries institutional failure, government interference on indigenous wetland management, failure in identifying, negotiating, and implementing trade-offs between the interests and claims of multiple stakeholders; associated anthropogenic interferences have depleted wetland resources. This study was in initiated to assessthe role of social capital in natural resource conservation so as to insure the sustainability of ecosystem service from wetland. A total of 168 household were selected from four kebeles adjacent to Abaya Lake using simple random proportional sampling technique. Descriptive statistics was used to assess types &role of social capital and narration was employed to explain community based institutional arrangement in the use and management of Small Abaya Lake. Econometric binary logit model was employed to identify determinants of household willingness to participate in the conservation of Small Abaya Lake & its catchment. Results of the study showed that most respondents were willing to participate in the conservation of Small Abaya Lake &its catchment. The existence of long term social capital (trust, mutual support community based bylaws, informal organizations & indigenous conflict resolution mechanism) enhanced the local community to conserve &manage Small Abaya Lake & its catchment. Nevertheless, the fragmentation of wetland in to agricultural land was also observed. The result of binary logit model revealed that Education, mutual support, effectiveness of institutional arrangements and awareness have positive and significant effects on willingness to participate for the conservation so as to sustain natural resource and associated ecosystem service provision, while, age and income have a negative and significant effect. for each increment of year of schooling ,the probability of willing to participation in conservation of wetland increased by 5.3%.people who perceived the existence of trust within the community 29% more likely to participate in the conservation of wetland. a birr increase in total income of the household, the probability of participation in conservation decreases by 0.05%. The findings show that the importance and strength of social capital has been getting less attention over the last decades. Consequently, this has been resulted in degradation of the small Lake Abaya and its surrounding. Hence, this calls for integrating social capital (indigenous with the formal institutional environment).

Key words: *Bylaws,Logistic regression, natural resource conservation,social capital, willingness to participate*

1. INTRODUCTION

1.1 Background and justification

Wetland ecosystems as natural resources are the most diverse and productive ecosystems on earth which include marshes, lakes, rivers, flood basins, estuarine deltas, ponds, rice fields, and marine water areas with more than three hectares (Act, F., 1971). Wetlands provide diverse functions such as fodder, fishes, fuel wood, ecotourism, flood control, act as sponges during dry season; regulate run-off, recharge ground water resources, source of income and livelihood for human beings (Opio *et al*. 2011). Wetlands are able to support livelihood strategies, such as fishing, pastoralisim, and agriculture, as well as providing craft materials, clean drinking water and medicinal plants developing world (Dugan, 1990).

People's long association with wetlands means that the indigenous system of wetland management and utilization are to be found throughout. Social capital constitutes the space in which community based traditional and local institutions exist (Shivakurmar, 2003). It is also community based principles and approaches, which communities share a common interest on building trust between each other, creation of local groups and enhancement of networks among communities, (North,1990). It is also would influence behavior towards collective actions and conservation such as willingness to participate in wetland areas management (PPP, 2000).

Social capital is the strategies of intervention that enhance the collaborating and making capable of the local groups (community associations, cooperatives, farmer groups, and local informal institutions etc…) and their empowerment through participatory methods as strategy to transform their practices and social organizations into sustainable and socially just systems (Pretty and Ward, 2001). It is also the shared norms and values, knowledge, institutions and networks

intrinsic to a specific community which are very important for sustainable management of common pool natural resources (Pretty and Ward). While, such institutions particularly those concerned with NRM, provide the rules and regulation for resource exploitation; are effective in mobilizing human resources; are involved in conflict resolution; and, perhaps fundamentally, they have been linked to equitable and sustainable Natural Resource Management (Upoff, 1992). But, in many parts of developing countries agriculture use of wetlands has increased as more and more people have been forced to seek new livelihood strategies, as a result of environmental degradation of other farmlands and population pressure. In addition to this, institutional failure, government interferes on indigenous wetland management and Government failure in identifying, negotiating, and implementing trade-offs between the interests and claims of multiple stakeholders; associated anthropogenic interferences have depleted wetland resources and reduced the rates of flow of the ecosystem services obtained from wetlands (Mc Shane and Wells, 2004). Degradation is an avoidable, alternative perspective in recent year have drawn attention to the ability of local people themselves to adopt their natural resource conservation and management systems to change taking place, enabling resources use to remain sustainable (Boserup, 1965; Tiffen *et al.*, 1994). Small Abaya Lake & its surrounding is found in silti zone with in silti-District and Lanfuro-District. The local community basically households from the two Districts use the lake for different purpose such as for irrigation, fish catching, home use, cloth washing and animal drink. But, today the lake is under high pressure from the user due to population pressure, waste damped from catchment flooded, deforestation and other natural disaster.

1.2. Statement of Problem

In the world, several environmentally sensitive areas have been declared as natural conservation zones, butlocal communities inhabit near to these resources because most of them are poor and little educated (Agrawal and Gibson, 1999). Many community-based arrangements take the assumptions of a community as spatially limited and attached group of people with shared norms and interests with homogeneous social structure and thus, fail to understand the multiple interest groups, the processes through which they interrelate, and the institutional arrangement that structure their interactions (IBD).

In Developing countries, community based common pool wetland resource conservation has been mixed, and many have been disappointed with the backward performance and less emphasis on their conservation (de Beer, 2013).

Wetlands in Ethiopia could be considered as an integral part of the environment in the country and provide multifarious social, economic and ecological benefits. However, a common incident that much of these resources are exposed to exploitation and signs of wetland degradation has become rampant across the country. Mismanagement, inappropriate utilization, the less participation in rehabilitation and conservation activities, un-sustainability of informal arrangements due to less empowerment, interference of government, natural and anthropogenic factors have led wetland degradation and dry up; while several of them have either disappeared or are on the verge of drying out globally, (Amsalu& Addisu**, 2014**). The recent total drying up of Lake Alemaya, Chelleleqa Lake near hawassa and the precarious existence of Lake Abijata are clear evidences of the looming danger on wetland ecosystem (IBD).In addition to listed above, shortage of farm land and their common pool nature there is a tendency to drain them for

agricultural and settlement activities thereby weakening other multiple benefits that they provide. To make their situation worse wetlands are polluted by all kinds of waste dumped and/or discharged on them and are exposed to excessive pressures from open grazing. The degradation of adjacent watersheds, excessive utilization of water, and the diversion of feeder streams are seriously damaging wetlands. To curb wetland degradation, rehabilitate wetlands, and sustain their benefits; the degree of involvement of local communities and prioritizing programs of bringing the communities together for conservation are very important, Because the conservation of wetland requires public support, appropriate institutional arrangement, and conservation programs (Rijal, 2001). Small Abaya Lake is one of the wetland where local community has been using the Lake for different purpose for a long period of time. In order to address the wetland degradation challenges and limited participation in conservation activities, factors such as, social capital like, (Trust, mutual support, civic engagement, bylaws, local traditions, shared norms, values, membership in debbo, Iddir, Equub, religious group, conflict resolution mechanism) and other socio economic and demographic characters have to be examined in order to understand their role either in promoting or impeding in wetland sustainability. Most of previous studies focus on participatory natural resource managementNhantumbo I. (2003;Fabricus C. & Collins S. (2007)) but, not specifically on role of social capital like, (Trust, mutual support, civic engagement, bylaws, local traditions, shared norms, values, conflict resolution mechanism, membership in debbo, Iddir, Equub, religious group)in wetland conservation and management. So far hardly any study has been conducted in the area on the role of social capital;thus, this study focuses on examining the role of social capital in natural resource conservation for the case of small Abaya Lake and its surrounding.

1.3. Objectives of the study

1.3.1. General Objective

The general objective of this study is toassessthe role of social capital and its relation with in natural resource conservation on AbayaLake Silte zone, Southern Ethiopia.

1.3.2. Specific Objectives

- To assess the types & role social capital in the study area.
- To examine informal institutional arrangements (bylaws) in the use and management of the small Abaya Lake andit's surrounding.
- To assess the determinants forhousehold willingness to participate in the conservation of Abaya Lake and its wetland.

1.4. Research Questions

- What are the types and characteristics of available social capitals in the study area?
- What are the informal institutional arrangements in the use and management of Abaya Lake?
- What are factors that determine household's willingness to participate in sustainable conservation of Abaya Lake?

1.5. Significance of the Study

There had been hardly anystudies in study area about role of social capital in natural resource conservation. Hence it is believed that this study was contributing to fill the identified research gap. As, this study show that how quantitative estimates can be made of to quantify the role of social capital in natural resource conservation. In doing so, it will shine light on the limited empirical literature on the specifically on the area broadly in Ethiopia. The study provided important information for policy makers on households' awareness about the importance of social capital in community based natural resource conservation. In addition, the study will

provide first-hand information for planners, researchers, natural resource managers, administrators and water and sewerage service office so as to secure improved water resource conservation in sustainable manner projects with active participation of the users.

1.6. Scope and limitation of the study

The scope of the study is limited to small Abaya Lake silitie zone south Ethiopia and the study focus on investigating the role of social capital in natural resource conservation. Insufficient time, finance, and are major problems that hinders the in-depth analysis of the problem. Each kebele in the study area are not included due to time and budget constraint.

2. Literature Review

Theoretical review

This chapter starts from definition of terms and concepts, definition of social capital and related literature, Types of social capital measurement of social capital, literature review on social capital and common pool resource conservation, determinants of social capital, role of community participation in wetland management, benefit obtained from wetland, factor for wetland degradation, informal institution in Ethiopia and finally, literature on determinants for willingness to participate in wetland conservation and management

2.1.Definition of terms and concepts

social capital: Social capital is a form of economic and cultural capital in which social networks are central, transactions are marked by reciprocity, trust, and cooperation, and market agents produce goods and services not mainly for themselves, but for a common good. The term generally refers to resources, and the value of these resources, tangible (public spaces, private property) and intangible ("actors", "human capital", and people), the relationships among these resources, and the impact that these relationships have on the resources involved in each relationship, and on larger groups. It is generally seen as a form of capital that produces public goods for a common good. Social capital has been used to explain the improved performance of diverse groups, the growth of entrepreneurial firms, superior managerial performance, enhanced supply chain relations, the value derived from strategic alliances, and the evolution of communities. During the 1990s and 2000s the concept has become increasingly popular in a wide range of social science disciplines and also in politics. Adler, S. P. and Kwon, S.K. (2002).

Wetlands: Wetland ecosystems as a natural resource are the most diverse and productive ecosystems on earth which include marshes, lakes, rivers, flood basins, estuarine deltas, ponds, rice fields, and marine water areas with more than three hectares (Convention on wetlands, 1971).

Social Capital Theory

Social capital has been studied by sociologists, economists, development Practitioners' and political scientists. Participatory approaches to development have been included in developed and developing countries alike. The prominence of social capital in development policy by organizations such as the World Bank has been both praised and harshly criticized (Putnam 1993; Woolcock, 1998; Cleaver, 1999).The conceptualization of social capital emerged out of debates regarding the determinants of social action within the social sciences. Historically, classical and neoclassical economists tended to pursue the "under socialized concept of man," operating under the assumption that action is determined through calculated, rational self interest of benefits versus consequences. This approach is criticized due to the lack of acknowledgement of the effect social structure and social relations may have on the actor (Granovetter, 1985). Weber (1968) contended that economic action is considered social if the behavior of others is taken into account. The under socialized perspective has potential pitfalls due to its inability to address the social nature of economic action (Granovetter, 1985).The opposite side of the continuum, the "over socialized concept of man," emphasized that human action is dependent on human existence as social beings (Granovetter, 1985). Thus, social action is the result of internalized norms and values and strict obedience to social systems. However, Weber theorized that social action consists of more than one type or motivation: rational orientation for discrete ends, rational orientation to an absolute value, effectual orientation, and traditional orientation. Rational orientation for discrete ends can be understood through the rational choice perspective

of weighing benefits and consequences. Rational orientation to an absolute value means that action is guided by actors' morality.

Social capital as a theory and a concept has been subject to a great deal of discourse that has led to a variety of definitions.Hanifan commented that social relationships created from fellowship, goodwill, and sympathy could be seen as social capital with the potential to improve the quality of life for the entire community (Hanifan, 1916 cited in Woolcock and Narayan, 2000).Social Capital consist of some aspect of social structures, and they facilitate certain actions of actor whether persons of corporate actors within the structure (Coleman, 1988).

Social capital stands for the ability of actors to secure benefits by virtue of membership in social networks or other social structures (Portes, 1998).Social Capital is social networks and the norms of reciprocity and trustworthiness that arise from the society (Putnam, 2000). Social capital refers to the norms and networks that enable people to act collectively (Woolcock and Narayan, 2000). Social capital is an instantiated informal norm that promotes cooperation between two or more individuals (Fukuyama, 2001).Contemporary scholars such as Bourdieu (1986) and Coleman (1988) described Social capital as the social context in which actors use groups and networks to access Specified benefits.

The definitions and articulations of social capital by Bourdieu (1986), Coleman (1988) and Portes (1998) emphasize the importance of social capital as an opportunity to access benefits found within embedded social structures. These potential benefits of social capital can include monetary support or non-monetary support (Bourdieu, 1986; Portes, 1998).The benefit of social capital to the larger community as a public good was addressed by (Coleman, 1988 and Putnam, 1993). The definition of social capital was extended to include the inclination of individuals to actively participate in public affairs, to trust in others, and to associate with one another regularly

(Putnam, 2002). Association of life - membership and active participation in civic life are necessary for healthy communities (Putnam, 1993). He noted that "successful collaboration in one endeavor builds connections and trust – social assets that facilitate future collaboration in other, unrelated tasks" (Putnam 1993). Those who involved in the creation and maintenance of social capital receive only a small portion of the overall benefits because social capital is a public asset (Coleman, 1988).Woolcock and Narayan (2000) and Fukuyama (2001) focused on social capital as a mechanism for cooperation and collective action. It is argued that the norms of reciprocity and trust shared within groups create an environment of cooperative behavior to help achieve and maintain goals (Fukuyama, 2001). The practical aspect of social capital as a way in which actors cope with risk and uncertainty, pursue interests, fulfill aspirations, and achieve goals (Woolcock, 2000). (Mohammed *et al*., 2015) by paper on" social capital and customary institution in conflict management" examined the role of customary pastoral institutions in managing conflicts. The paper indicated that intra-ethnic conflicts can be managed customarily because of shared norms attributed to the social proximity and cultural homogeneity, whereas managing inter-ethnic conflicts goes beyond the capacity of elders' council exercising customary law. The introduction of ethnic-based federalism and historical political relations between different ethnic groups has weakened customary institutions in managing inter-ethnic conflict. Using elders as community representatives in the formal system has negatively affected them because of community mistrust where they believe that 'state elders' are loyal to the state than to the community.

A number of studies underline the role of social capitalin conflict management on common pool resources (Watson 2001; Chemeda *et al.*, 2005; Sanginga *et al.*, 2007). The concept of social capital in conflict management provides a mechanism to assess the contribution of traditional

and shared norms, rules and conventions to govern conflict-triggering behavior. Along this, (Sanginga *et al.* 2007) suggest for an institutional framework that maintains synergy between social capital and government policy to build local capacity for alternative conflict management. This evades the pessimistic view that portrays a decline in the role of traditional authorities. Yinger Dessie, (2012) Assessed the role of social learning, institutions and social capital for soil conservation in Northern Ethiopia. The findings showed that social learning encourages adoption of soil conservation measures while it created opportunity for broader understanding on soil conservation and for the emergence of trust and mutual understanding among the actors. He also investigated that social learning plays a role for the application of indigenous and scientific knowledge and the creation of social capital. As he investigated, Social capital elements such as trust and cooperation were higher among adopter farmers may be due to their involvement in social learning platforms. Moreover, Dessie Y., reported, the social capital between experts, farmers and local administrators was higher in Amba Zuria where social learning was intensified. The result also showed that Bylaws and guidelines were used to guide when and how to learn, how to monitor and evaluate soil conservation activities and how to coordinate actors at various levels. In this regard, local institutions had a great role in strengthening the network of local actors with higher level actors at the district or regional level. This shows that local institutions and actors can play a great role in the adoption of soil conservation innovations.

Social Capital Theory

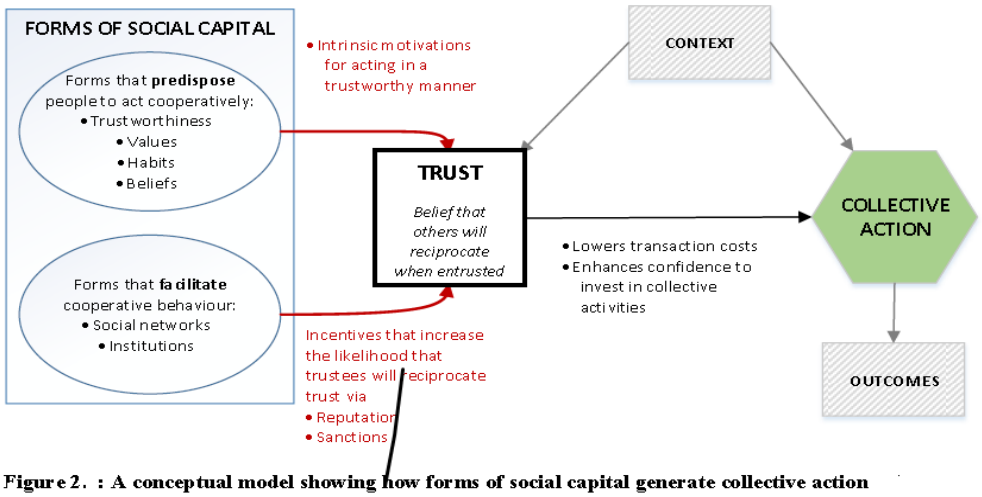

Figure 2. : A conceptual model showing how forms of social capital generate collective action

2.2. Types of social capital

2.3.1. Structural social capital

Structural social capital consists of networks and ties to which individuals or groups have access. Structural social capital includes both horizontal and vertical organizations and associations. Horizontal structural social capital is characterized by informality. It is considered to be important to sustained trust and collective action, while vertical associations, characterized by member hierarchies, may place some restriction on the formation of structural social capital (Putnam, 2002).The assertion that membership in horizontal organizations are best for the accumulation of social capital has been debated. Studies have shown that membership in these types of organizations are not necessarily associated with higher social capital than vertical associations (Krishna *et al*., 2000). Structural social capital can be inward-looking social capital or outward-looking social capital (Putnam, 2002). Inward-looking associations tend to provide benefits to members only and are likely to be homogenous along gender, ethnic, or class lines. Outward-looking associations are groups that are explicitly interested in the enhancement of community and civic society. Both inward and outward associations have the potential to

increase social capital. Bonding and bridging social capital are distinguished aspects of structural social capital. Bonding social capital is similar, yet distinct from, inward-looking organizations (Putnam, 2002).

Bonding social capital are connections with those most identical to a person's gender, ethnicity, class, race, etc. In developing countries, bonding social capital are typically those connections within villages. Those with high levels of bonding social capital may act upon these close-knit networks to 'get by' (Woolcock and Narayan, 2000).Bridging social capital consists of connections to those that differ from one's own identity such as weak intercommunity ties (Woolcock and Narayan 2000; Putnam; 2002). Ties defined as bridging social capital are seen as important ways 'get ahead' (Woolcock and Narayan 2000).

2.3.2. Cognitive social capital

Cognitive social capital is comprised of norms, values, attitudes, beliefs, and trust (Uphoff, 1999). Possessing high levels of cognitive social capital potentially predisposes actors toward beneficial collective action (Krishna and Uphoff; 2002). Trust can be created by organizations through the adherence to norms, obligations and expectations of the organization (Sorenson, 2000). Trust facilitates efficient exchange and reduces the need for continuous monitoring of exchange systems. Mutual trust makes it more likely that these systems remain stable and operable.

2.3. Measurement of social capital

Although there have been a number of different approaches taken for research in the area of social capital research, there is much fruit to be taken from a synthesis of the various approaches. There is considerable debate and controversy over the possibility, desirability and practicality of measuring social capital yet without a measure of the store of social capital, its characteristics

and potential remain unknown. Many authors have identified that measurement attempts are flawed by problems with separating form, source and consequences, however, a large number of studies have applied questionable techniques to a very wide range of applications. Clearly there is disagreement over the validity of measures of social capital. There are many unresolved issues involved in the measurement of social capital. It seems from the literature that designing and applying context appropriate indicators of social capital can achieve useful measurement, however further work is needed to develop this area of the theory. It is now widely accepted that social capital can be increased in the short term however there is a lack of understanding of the processes of how they operate to build or improve social capital structure. Although there has been very little work directly related to social capital and natural resource management, much work is required to understand the interaction of social capital and natural resource management. In recent study of the relationship between communication networks and wetland sustainability (Dixon, 2005), the lack of social capital, in terms of cooperation, communication networks and common values among wetland using communities, clearly manifested itself in the form of wetland degradation. In effect, a breakdown in communication, cooperation and mutual respect among wetland users, for reasons which require further investigation, was shown to lead to destructive practices such as overgrazing and double cropping.

2.4. Determinants of social capital

The determinants are numerous and varied and there is both a lack of consensus and a lack of evidence to support the propositions. Several influential studies have suggested that social capital's roots are buried in centuries of Cultural Revolution (Fukuyama, 1995 and Putnam *et al*., 1993). Other investigators suggest that social capital can be created in the short term to support political and economic development (Brown and Ashman, 1996; Fox, 1994; (Tendlerand and

Freedheim; 1994). Aldridge, 2002; Halpern *et al.*,(2002) suggested that the main determinants of social capital include: history and culture; whether social structures are flat or hierarchical; the family; education; the built environment; residential mobility; economic inequalities and social class; the strength and characteristics of civil society; and patterns of individual consumption and personal values.

The concept of social capital has been applied to various settings in both developed and developing countries using different levels of analysis, measurement and methodological approaches. Debates remain regarding what constitutes social capital in varying social and cultural contexts (Krishna and Shrader; 2000). Narayan and Cassidy (2001) created the Global Social Capital Survey. They reviewed several social capital instruments and found that measures of trust and organizational membership were universally used. Then, multi-disciplinary workshops at the World Bank were held in order to refine the instrument. Finally, the survey instrument was pilot tested using 1,471 households in Ghana and 950 individuals in Uganda. Structural equation modeling (SEM) was used to explore dimensions of social capital. From the analysis seven dimensions of social capital were identified. The dimensions were: Group characteristics, generalized norms, Togetherness, Everyday sociability, Neighborhood connections, Volunteerism and Trust. (Onyx and Bullen; 2000) Conducted a survey in New South Wales, Australia that investigated social capital within five communities By using factor and correlation analysis to identify dimensions of social capital. As the study identified that the specific factors for social capital were: Participation in the local community, Social agency or proactively in a social context, Feelings of trust and safety, Neighborhood connections, Family and friends connections, Tolerance of diversity, Value of life, Work connections and proactively in a social context (employees). Grootaert and van Bastelaer (2002) distinguished macro versus

micro approaches to measuring social capital. It was argued that successful macro approaches to measuring social capital included assessing the institutions of the country, the rule of law, and governance. Micro approaches to measurement were assumed to encompass the dimensions discussed earlier including networks, organizational membership, trust, norms, and values. Grootaert and van Bastelaer (2002) suggested that studies of social capital should focus on membership in local associations, trust and norms, and collective action.

Rural Ethiopians have created and maintained associations and organizations since the early twentieth century (Pankhurst and Hailemariam; 2000) while, Much of the insurance and credit activities are embedded within social networks like, Iddir, equub, and labor sharing groups are organizations in which rural Ethiopians participate. Participation in these groups is common among many Ethiopian households, but the amount of organizations and the extent of participation in these groups vary between regions and villages (Hailemariam, 2000). These groups offer access to pooled resources, high levels of trust, and social support (Hailemariam, 2000). An *Iddir,* the most prevalent group, is a burial association that provides insurance to households if death or illness were to occur (Pankhurst*et al*., 2000). Some *iddir* help with weddings or other events. There is evidence that some iddir are unionizing in an attempt to address social issues such as HIV/AIDS (Pankhurst and Hailemariam; 2000). An equub is a savings or credit group into which members pay. This informal banking system runs on informal trust (Teshome, 2008), enforce saving, promote sharing of ideas, is less bureaucratic than formal alternatives, offer loans with small interest rates, foster social cohesion, provides additional income, and finances small to medium enterprises for members. Labor sharing groups are common in Ethiopia. These are reciprocal schemes in which members are called to work on the farm of other members. Studies on social capital in Ethiopia have examined the way in which

social capital has led to successful natural resource management. One study using the ERHS found that 91% of rural Ethiopian households have social ties and networks that may provide assistance in a time of need (Hoddinott, *et al*. 2005). Of this 91%, it was found that 75% of the households had both received from and provided assistance to others. Most ties and networks are typically within the same village and are connected by kinship or by membership in an *iddir*.

2.5. Social capital and common-pool resource management

The term "social capital" has gained increasing popularity among academics and practitioners, who viewed it as useful in delivering desirable outcomes in social and economic development. Based on a review of key literature on social capital (e.g. Coleman 1988; Putnam 2000; Putnam *et al.,* 1993; Woolcock 1998), social capital in this study is defined as a set of values, such as the norms of reciprocity, and social relations embedded in the social structure of a society, that enable people to act collectively to achieve their desired goals. The most important point is that by developing social capital, a group of people can build trust, which affects the degree of their collaborative actions. Theories of common-pool resources (CPR) are particularly important in the study of the governance of natural resources, and they explain why social capital is necessary in CBCRM. The literature on "new institutionalism" demonstrates a general consensus that building institutions that empower local communities is a prerequisite for long-lasting resource management. This is because institutions reduce uncertainty by providing structure to management (North, 1990) and by clarifying those actions that are permitted and those that are not allowed to do. As CPR researcher (Ostrom, 1990) has argued a certain level of trust among resource users is necessary to sustain institutions. To avoid commons problem caused by the two key elements of subtract ability and excludability, long-lasting CPR use requires cooperation

among users (Ostrom,1990); to some extent, users need to share norms and understand rules regarding, resource use so as to maintain institutions. There is a growing interest in social capital and its potential impact for affecting collective action in sustainable renewable natural resource institutions (Rudd 2000; Sobels *et al.,* 2001; Walters, 2002).

Pretty and ward;(2001) identified that where social capital is well-developed, local groups with locally developed rules and sanctions are able to make more of existing resources than individuals working alone or in competition. Social capital indicates a community's potential for cooperative action to address local problems. As it lowers the costs of working together, social capital facilitates cooperation and voluntary compliance with rules (Pretty and Ward 2001). The norm of generalized reciprocity assists in the solution of problems of collective action. Adler (2002) identified that it transforms individuals from self-seeking and egocentric agents with little sense of obligation to others into members of a community with shared interests, a common identity, and a commitment to the common good. Brewer (2003) believed that denser networks increase the likelihood that people will engage in collective action. There is also evidence linking social capital to greater innovation and flexibility in policy making.

2.7. Role of Local Community participationin wetland conservation

Wetland conservation is a long termed endeavor that has often allowed local communities to increase their revenue or meet their needs in the short term. Conservation must includes educational activities and provide local communities with new sources of income or alternatives allowing them at least maintain and if possible improve their living standards.

Many examples of program failure have cited in rural areas due to lack of local participation. People should be target of any conservation activities and involved in all phases of wetland conservation and management. An approach excluding consultation with local communities

takes no account of the role and knowledge of people who have manages the areas to ensure their own livelihood. Recognizing the importance of wetland dependent people, National Wetland Policy (2003) has identified the local people participation as the one of the main element to conserve and manage wetland resources wisely and in a sustainable way.

In developing countries, people that depend on the natural resources, including wetlands, come forward for conservation action once they realize the economic value of that ecosystem to their family's subsistence. Their attitudes and perceptions, in many cases, are shaped by the benefits that are seen to accrue from such ecosystem resources. The positive attitudes and perceptions are a good indicator that if some conservation initiative is taken, for example, a community-based conservation approach, there is a greater possibility of increased participation of local people in the conservation activities. However, the current conservation approach has limited community participation indecision making and planning. A number of previous studies (Mehta and Heinen 2001, Andrianandrasana *et al*. 2005, Bajracharya *et al.* 2006) also propose a community-based conservation approach for better wetland resource use and conservation. The implementation of community forest programs, which also incorporate the community-based conservation approach along with many other pro-poor aspects (equal access and equitable resource distribution) in the lake complex, can be a good option because they empower the poor and disadvantaged resource-dependent communities and improve their livelihoods in the long run. The local community welcomed the conservation organizations only if they saw a long-term benefit and local participation. This necessitates conservation organizations to provide pro-community programs so that additional households come forward and lend a hand for the participation and conservation programs. The involvement of local people in the planning and decision-making processes of the lake user group steering committee could increase people's participation and

alter their perceptions toward the development organizations. Baral and Heinen (2007) and Diouf (2002) support the view that decentralized participatory conservation programs could help resource-dependent developing countries minimize obstacles between conservation and sustainable development if they are implemented carefully. Importance of cultural heritage, indigenous knowledge and local practices appreciated in the wise use of wetland resources and local people's role in the stewardship of wetland area. However, local community dependence on wetland resources with low involvement in their management, weak, un-diversified, and insecure livelihoods based on the direct exploitation of natural resources causes hindrance in conservation Aral and Heinen (2007) and Diouf (2002).

Wetlands provide free goods and services to numerous rural and urban communities hence maintenance of the essentials values and function of wetlands is the major role of community. Maintenance: with the preservation of the hydrological and ecological processes, is the vantage to maintain the essential values and function of wetlands in Community can play pioneering role in many functions that are necessary for sustainability and equitability; merely the conservation programs should represent local communities for the consultation in plan development phase. Moreover, local communities are important stakeholders in using resources. Wetlands have many stakeholders at community level with diverse interests, the major ethnic groups dependent on wetlands in the kingdom are small fractions of the population and are scattered over regions and these are the major wetland users. Many of them have their own language, culture, physical features and way of life they may live along the river basins and wetland sites.

People depended on wetlands resources own very little and they are shy and provincial in nature. Wetland depended people can play major role in the conservationpractices.Collective resource management programs that build trust, develop new norms, and improve natural capital

outcomes have become increasingly common and are described with such terms as community, participatory, joint, decentralization management, and co management. Such advances in the creation of social capital that emphasize better bonding with in groups and bridging between them have led to the formation of local groups in a variety of management sectors, including watersheds, forests, irrigated and drinking water, pest, wildlife, fisheries, farmers research, and micro-finance (pretty and ward 2001).Underlying the idea of community-based resource management is the recognition that humans are part of the ecological system, and not separate from it. Today's wetlands, including those considered to be the most pristine, are the result of complex interactions among physical, biological, and human forces over time. Virtually all of the earth's wetlands have been influenced and altered by patterns of more or less intense human use. Now, participatory management is generally defined as: a partnership in which government agencies, local communities and resource users, andperhaps other stakeholders, such as NGOs, share the authority and responsibility for management of a specific area or set of resources.

2.8. Causes of wetland degradation

As Mukhtar Ibrahim (2011) assessed Community-based Natural Resources Management at Lake Naivasha in Kenya, Recently its management and conservation has been devolved to the local communities in a bottom-up participatory approach to replace the traditional top-down management strategy. Additionally, he also assessed the role of Community-Based Natural Resources Management (CBNRM) in achieving sustainable water management at Lake Naivasha. The results showed that a diversity of stakeholders with different interests for water access, Environmental degradation, over-enriched muddy pool, water abstraction for irrigating, the flower farms, drought, Habitat destruction, excessive water abstraction for both agricultural

and domestic uses, were affecting both the lake hydrology and the surrounding wetland ecosystems (Mukhtar Ibrahim, 2011).

2.9.1. Institutional environment and institutional arrangements

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 (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.

2.9.2. Community based Informal Institutions for wetland management in Ethiopia

Borana is located in Southern Ethiopia had developed socially embedded rules and regulations to manage scarce water sources and pastures. These flexible social institutions define and enforce overlapping rights and entitlements “bundle of rights” to communal water and grazing land. The Borana communal rangeland system is a web of social codes, norms and practices that constitute a hierarchical social system known as the gada system (Swallow and Bromley, 1995, Watson, 2003). At the helm of the gada system is the aba gada who is elected every eight years in an assembly that is open to all Borana men. The aba gada and his male councilors, the yea, comprise the main decision-making body of the Borana common property system. Each governing body serves for eight years. The governing body formulates and enforces general laws - the aada seera - that govern access to and use of communal water and forage. Each newly elected governing body revises existing tenure arrangements and Rangeland management in Borana is a social and political affair that primarily involves male dominated governing councils headed by elders.While, (Belayneh, 2015) also assessed the development interventions versus indigenous resource management institutions, While the essence of building social capital and local indigenous institutions in the management of common property resources was gaining grounds in the recent times, most government policies in pastoral areas of Ethiopia as well as in Africa were drawn on the over-riding dominant narrative of the theory of ‘tragedy of commons’. he also attempts to exposed how ill-intentioned government policy have eroded customary resource management, conflict resolution and livelihood resilience practices, and paved the way distrust and non-cooperation; resource degradation; livelihood vulnerabilities, and perpetuation

of conflicts in the area. while the tragedy of commons narrative has some grain of truth in some contexts, scholars and policy makers should also look into how best common property resources can be managed by capitalizing on social capitals and customary institutions rather than destroying them, as successful management of natural resources require both an understanding of ecosystem processes and of the interactions between people and the ecosystem.

2.9. Determinant factors for the willingness to participate in wetland conservation

Participation is defined by Biswal (2006) as "a voluntary process by which people, including the disadvantaged (in caste, gender, income, or education), influence or control the decisions that affects them". On the wetland resource conservation areas, community's participation is crucial for sustainable outcomes. The emerging efforts towards participatory environmental resources management including local community from planning to implementation level of environmental conservation initiatives was influenced by a proven failure of "top-down" management approach (Roe *et al.*, 2009; Shan, 2012; Sakurai *et al.*, 2015). However, participation of local community in environmental conservation interventions is not easy because of their complexity that may be associated with differences in demographic and socio-economic behaviors (Shan, 2012; Sakurai *et al.*, 2015).

Studies have been conducted to assess willingness of local community to participate in conservation of wetland or in developed countries especially North America and Europe but very few in developing countries (Sakurai *et al.*, 2015). The study by Sakurai *et al.* (2015) found that need for social interactions and interests in conservation activities were among the factors influencing local community willingness to participate in conservation activities in Yokohama city. Shan (2012) argue that, education level were the main factors influencing Guangzhou residents' willingness to participate in green spaces conservation interventions such as decision

making process. Additionally, local community understands, concerning and intentions to restore environmental problems can influence their willingness to participate in conservation interventions of environmental resource (Chun *et al.,* 2010).There are number of related studies conducted in rural areas regarding environmental or natural resources conservation. For example, Mpokigwa *et al.* (2011) argue that, communication, education and public awareness can positively influence local community to participate in Forest conservation interventions. Kangalawe (2012) argue that, Irangi hills community demonstrated their willingness to participate in conservation initiatives by self adoption of various conservation measures like tree planting and best agricultural practices. Local community's willingness to participate in conservation of natural resources can be low due to the perceived benefits losses or perceived costs from unfair sharing of various environmental costs and accrued benefits (Sesabo *et al*., 2006; Mwanyoka, 2006). As these studies (Sesabo *et al.,* 2006; Mwanyoka, 2006; Mpokigwa *et al.,* 2011; Kangalawe, 2012) informed that, local community could participate in natural or environmental resource conservation initiatives but their decision to participate could be influenced by their social economic and other factors like institutional arrangement. Therefore, it is important to understand the degree of willingness and influential characteristics of local community towards participatory environmental conservation interventions for sustainable and effective outcomes.

Dedah (2010) found that in addition to landowner characteristics, risk aversion played an important role in determining the likelihood of participation as well as the amount of investment in wetland restoration and maintenance projects. Yu and Belcher (2011) suggested that payment is an important factor in landowners' conservation adoption decision. Other impacting factors include landowner experience, planning horizon, and perceptions of wetland values. (Bewket *et*

al., 2006) were analyzed the extent of farmers' participation in current soil and water conservation activities in the Chemoga watershed, East Gojjam Zone, Amhara Regional State by employing formal household survey, informal and focus group discussions and field observation to generate the data. The results indicated that the majority of the farmers participated in the soil and water conservation against their will. The most important factor discouraging them from participating freely was the perceived ineffectiveness of the structures under construction. Awareness about soil erosion as a problem, labor shortage and land tenure insecurity were found to be less important in providing an explanation for the disinterest shown by most of the farmers towards the soil and water conservation activity.Siribuit *et al.* (2008), based on a study of socio-economic conditions affecting small farmers` management of wetlands in Thailand noted that, education of household head, amount of livestock and income from wetland products had a positive influence to households` participation in wetland resource management activities. Zidana *et al*. (2007) undertook a case study to establish factors influencing cultivation of the Lilongwe and Linthipe river basins in Malawin. Kapanda *et al.* (2005) evaluated factors affecting adoption of fish farming in wetlands in Malawi and noted that, household head gender had a negative influence, while household head age and livestock ownership had a positive influence on adoption rate by respondents. Muchapondwa (2003), based on a study of assessing the potential of local communities to manage wildlife in Zimbabwe noted that, younger and highly educated household heads were more likely to view local wildlife management as a bad public need. The need for community participation in the conservation and management of wetland resources is understood globally (Williams, 2002). The traditional approach of protection by prohibition using legislation and guarding is losing ground. The restriction of local people's access to natural resources that have supported their livelihoods for generations can be good

from a conservation point of view only for a short time (Andrade and Rhodes, 2012). (Andrade, 2012) reported that the higher the level of community participation, the higher their compliance to the resource conservation; community inclusion is a must for long-term conservation. In developing countries, where food security and poverty reduction receive higher priority than environmental protection, wetland conservation is difficult if the local communities do not understand the value of the wetlands (Wood *et al*., 2002). For successful conservation and management, the participating local communities should be fully aware of the importance of wetlands as parts of water cycles, as well as the nature and effects of human impacts (Williams 2002). Participation of indigenous communities with their traditional knowledge, skills, and practices can help resource conservation while meeting their daily requirements. For fishing communities in Bangladesh, Rahman *et al.*, and 2011) report the importance of seeking livelihood diversification options that enable the conservation of exploited wetlands without harming the livelihood of dependent resource users. At Poyang Lake Wetland (zhu *et al.*, 2016) analyzed farmers' willingness to participate in wetland restoration and factors that will affect farmers' participation decisions. As the findings of this study showed that, farmers' education level, household migrant members, number of dependents, household net income, farm type, and distance to urban areas have significant effects on farmers' participation in wetland restoration. The author also assessed farmers' perception about the ecological values and benefits of wetlands and their knowledge about wetland restoration policies but, the result do not appear to significantly influence farmers' willingness to participate. A study by Chun *et al*. (2012), at Temiang River watershed in Malaysia, indicates that voluntary involvement was more important than awareness alone for conservation, and factors such as age, education, gender, income level, marital status, and residential location affected participation. According to Badal *et al*., 2006

effective local institution enhances participation in wetland conservation activities by imposing sanction those who were unwilling to participate in wetland conservation participation activities. Enhancement of the role of existing institutions is equally important for sustainable resource management. Conservation activities of local conservation organizations are more effective than those of outside designed and induced projects. Community based conservation is a better alternative compared to central level handling of natural resources and is an effective tool in solving conflict and engaging community participation for resource conservation, including wetlands (Trisurat, 2006).Community-based conservation approaches have been adopted in a few wetlands of Bangladesh for more than a decade and have been highly successful in securing public participation, benefiting sharing and conservation (Thompson and Choudhury, 2007).

As Asefu and Araya assessed age of the household head is expected to be inversely related to the level of participation. Younger farmers a usually more educated and hence have higher level of awareness about the problems of soil erosion and depleting water resources. In addition, they are more concerned about the future productivity of land as they have a higher life expectancy and a longer planning horizon (Araya and Asafu-Adjaye, 2001). Education is expected to influence positively as it leads to greater awareness about the benefits of these programmes.

Conceptual Frame work for sustainable Common pool resource management

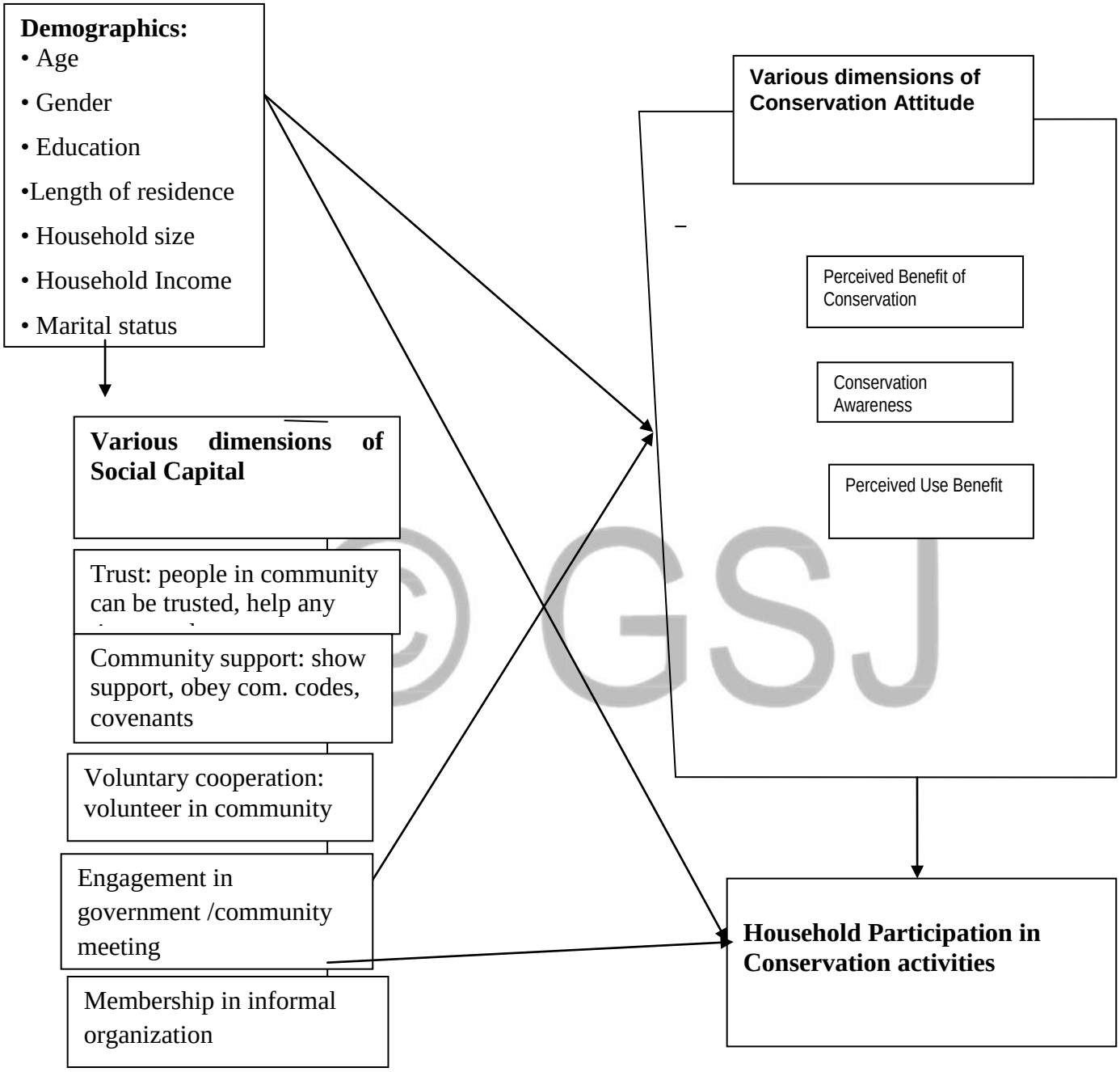

Figure 1 conceptual frame work for the participation in conservation of natural resource

3. Methodology

3.2. Description of study area

3.2.1 Location of the study area

Small Abaya Lake is located within Lanfuro & siliti districts. Small Abaya Lake & its surrounding cover a total area of 1253ha. It is shallow lake with the maximum depth of 9 m. The districts in which Small Abaya Lake & its surrounding is located at 250 Kilometers away from the capital Addis Ababa and 160 km in Southwest direction of the regional capital Hawassa. The district has 72 PAs in rural areas and 7 kebeles in urban settings. It is bordered with Jido Kombolcha Wereda in the East, Gurage Zone in the North, Alaba special Wereda in the South and Dalocha Wereda in the West are bordering the district. Geographically, the district is located at 7^0 37'3^0"N to 7^0 0'0" N latitude and 38^0 9'36" E to 38^0 31'12"E Longitude. Its altitude ranges from 1870- 2000 m a.s.l.

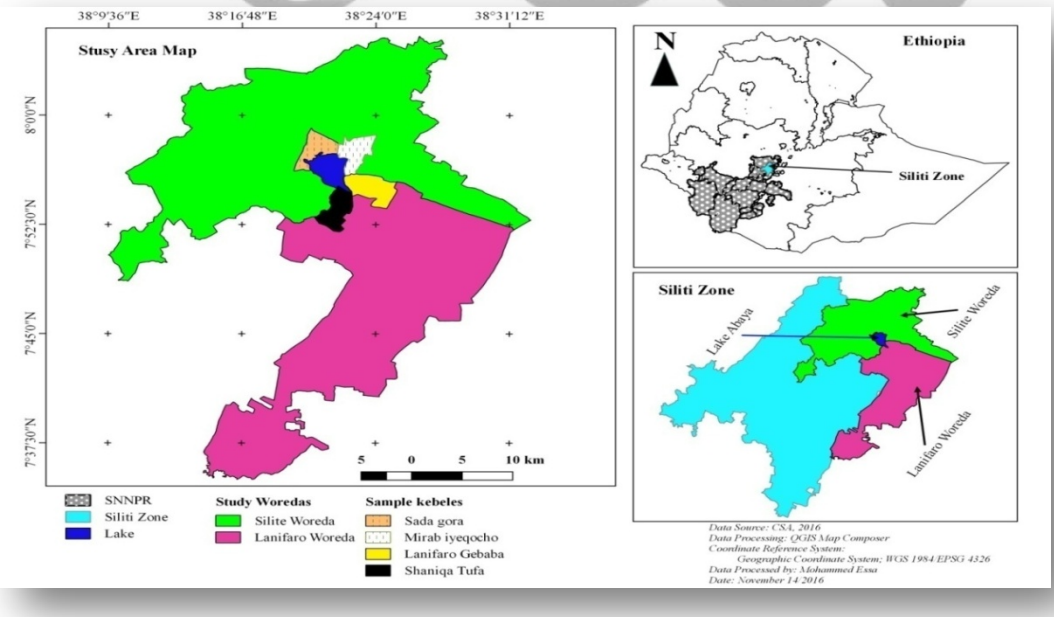

Fig.3.Map of study area

3.2.2. Climate

Dry weyna Dega is the agro climatic zone that prevails in the district. It is characterized by frequent drought, and hence moisture stress is the central problem for agricultural production. It has a bimodal rainfall distribution in summer & autumn, of which a maximum average annual rainfall is estimated at less than 900 mm. The maximum annual range of temperature, which is recorded in winter season, is 30 ^{o}C while the minimum annual temperature recorded during summer season is 18 ^{o}C (SZBOARD, 2015).

3.2.3. Land use

The total area of the District is 100,166 hectare. The district lies in the altitude range of 1870 and 2000 Meter above sea level (m.a.s.l). Cultivated and grazing lands of the district accounted for 65,722 and 7566.5 ha respectively. Forests and shrub lands accounted for 825ha of the district. Degraded and others accounted for 20014 ha of the district. The area is dominated by sandy and clay soil.

3.2.4 Population characteristics

Socio-economic characteristics of Lanfuro-Silti District Based on the 2007 District based population and house census report, the total population of the district is estimated to be 358,835 of which (50.95%) is male while the remaining (49.05%) is female population. The major ethnic group of the district is Silti. The dominant religion in the area is Islam. The maximum and minimum family size of the district's population is 15 and 1 persons respectively.

3.2.5. The farming system and Vegetation

The farming system in the region is characterized by mixed farming. The agro-climatic condition of the region is favorable for growing diversified types of crops and rear different species of

animals. The average farmland size per household was 0.98 hectares (RADO, 2015). Maize, sorghum, wheat, bean, and barley are the dominant crops frequently grown at the district. Vegetables like cabbage, pepper, potato, tomato and onion are commonly grown in the district. Production in the district is dependent on rain fed agriculture mainly undertaken by waiting the rainy season that is once per year, except the border communities of Small Abaya Lake.

3.3. Sampling Techniques and Sample Size determination

In Lanfuro-Silti District there are 12 beneficiary kebeles that lie on adjacent of small Abaya Lake. Within these beneficiary kebeles four rural kebeles were randomly selected and from the list of total households of the 4-rural kebeles sampling frame were proportionally organized and the sample size were determined. Several rules-of-thumb has been suggested for determining the minimum number of sample households required to conduct multiple regression analysis. The study used a method developed by Green (1991) to select the total sample size from the total households. He suggested a rule-of-thumb that $N \geq 50 + 8m$, where N is minimum number of sample households required to conduct multiple regression analysis and m is the number of explanatory variables used in the regression analysis. The explanatory variables used in this study were fourteen. So that the minimum sample size is $N \geq 50 + 8 \times 14 = 162$. However, considering the benefits of large sample size to increase the quality of the study by adding additional samples, a total of 168 sample households were surveyed for the study. But For analysis, 166 samples were used in the analysis because two observations were with incomplete information.

Table 1.sampling Technique and sampling determination

Districts	Sampled kebele	Total household	How to compute	Total sample
Lanfuro	Gebaba	1550	1550*168/7260	35
	Tuffa	1940	1940*168/7260	45
Siliti	Seda Gora	1967	1967*168/726046	
	Merab	1803	1803*168/7260	42
Total				168

Source: District Agricultural and rural development office, (2016)

3.4. Data Source and Method of Data Collection

Both quantitative and qualitative Data were collected in this study. These data were collected via primary and secondary data sources. To collect these data, different data collection methods were employed, secondary data were also collected from documents compiled in District, and Kebele archives, documents, journals, and others sources from concerned bureaus. Moreover, primary data were collected by using tools used including household survey; key informant interviews and focus group discussion were employed to produce primary data. The following are tools for primary data collection

3.4.1. Household survey

Questionnaire containing both open-ended and closed-ended questions were prepared and distributed to the sample households. Information collected consists of socioeconomic characteristics, determinant of wetland conservation, social capital and their role in natural resource conservation, and available social capital and its impact on natural resource conservation in the study area. The questionnaires distributed to household were enabled to generate both qualitative and quantitative information.

3.4.2. Key Informant Interview

The key informant interviews wereused knowledgeable people from the community. For this study, knowledgeable people from the community, concerned experts and concerned experts were used. I.e. natural resource expert were selected as KI in each community, elders and religion leaders that are familiar to the study areas and knowledgeable about the research issues were selected purposively and discussion was made with them.

3.4.3. Focus group discussions

Focus group discussions were made with the representatives of the community to obtain in-depth information on concepts perceptions, and ideas of the groups. The different groups (elders, youths, and women) were organized consisting of 6-8 households of various experiences with careful supervision to keep them on track of what was needed to be studied. It aims to be more than a question-answer interaction. Separate discussion was held with, elders, women, youths groups on general issue of social capital, and its role on natural resource conservation as well as information related to small Abaya Lake.

3.5. Method of Data analysis

The survey data were analyzed by using both descriptive and econometric analysis

3.5.1. Descriptive statistics

The descriptive statistics including mean, percentages and frequency distribution were employed for this study. Socio economic and demographic variables and typesof social capital wereanalyzed by descriptive statistics. But, community based bylaws in the use and management

of Small Abaya Lake, characteristics of social capital and social capital and natural resource management were analyzed by narration.

3.5.2. Econometric Analysis

Quantitative data that include determinants for the willingness to participate in conservation of small Abaya Lake and its surrounding was analyzed by binary logistic regression model, because it is categorical dependent variable. Which takes willing to participate in the conservation and unwilling to participate in the conservation (1, 0).

3.5.3. Econometric Model Specification

3.5.3.1. Binary Logistic Regression Model

Regression models in which the dependent variable is dichotomous can be estimated by logit or probit models. Logit and Probit models give guarantee for the estimated probabilities increases but never lie outside (0, 1) interval and the relationship between probability of event (Pi) and the explanatory variable (Xi) is nonlinear (Gujarati, 2004).The estimators, however, end up with almost the same standardized (marginal) impacts of independent variables (long 1997 cited in park, 2008). Therefore, for this study Binary logit model is used to identify the determinants of household conservation towards the lake. The dependent variable is dichotomous, and equals 1 if the i^{th} household is participate in conservation but becomes 0 other wise. If *Pi* is the probability that the i^{th} household is willing to participate in conservation, then (1-*pi*), the probabilities of household unwilling to participate in the conservation of wetland. Willing to participate in conservation or unwilling to participate in conservation in relation to independent variables can be depicted in linear probability as follow:

$Pi=E(Y=1/xi) =\beta_1+\beta_2 xi$

Where X is the independent variable and Y=1 means the household participate in conservation thus, this can be expressed as follow:

An individual farmer is assumed to maximize the expected utility gain from participating in Wetland conservation activities. Let UP is the expected utility when a farmer is willing to participate and UN is the expected utility of not participating in wetland conservation. We then can define the farmer's Decision process as follows:

Willingness to Participate = $\begin{cases} 1 \text{ if } UP- UN > 0 \\ 0 \text{ if } UP-UN<0 \end{cases}$ …..…….1

Hence, a farmer is willing to participate in wetland conservation if and only if the expected utility from participating is greater than that of not participating, that is, UP > UN. In this paper, a logit model is proposed to estimate the binary choice of farmers' willingness to participate. Following Wooldridge, the binary choice of willingness to participate is assumed to be generated by a linear latent variable model. The latent variable (yi) indicates farmers' utility gain by participating in the wetland conservation program. **x** is a vector of attributes determining farmers' willingness to participate in wetland conservation, containing farmers' individual and household characteristics; farm operation characteristics; and variables representing ……The random term e is assumed to follow a normal distribution with a zero mean and variance *s*2.

$Yi = xi\theta + ei$ where, $ei/xi \sim N\{0, \delta^2\}$……2

Willingness to Participate = $\begin{cases} 1 \text{ if } yi > 0 \\ 0 \text{ if } yi < 0 \end{cases}$ ……... …3

P (Willingness to Participate = 1/**x**i) = P {yi > 0/**xi}** = P (**x**iθ+ ei > 0/xi) ……...4

P (willingness to participation in wetland resource conservation) = $\ln\frac{Pi}{1-Pi}$ = β_0+ $\beta_1 age+\beta_2 sexhh+\beta 3landsiz+B4inc+B5educ+B6Fs+B7sot+B8AWA$ $+B9Mus+B10occur+B11hhs+B12reyes+B13mastas+B14ins\ eff+\varepsilon i.$

3.5.2.2. Multi-collinarity Test

Before estimating logit model, existence of multi-collinarity among the continuous and dummy variables was checked. Multi-collinarity problem arises due to a linear relationship among explanatory variables and for no unique estimates of parameters (Gujarati, 2004). This causes large variance and standard error with a very low t-ratio and wide confidence interval. To avoid the problem of multi-co linearity, both continuous and dummy variables were checked prior to executing the logit model. Variance inflation factors (VIF) technique have been employed to detect multi-collinarity in continuous explanatory variables (Gujarati, 2004) and contingency coefficient (CC) for dummy variables. According to Gujarati (2004) VIF (Xi) can be defined as VIF (Xi) = $(\frac{1}{1-R^2})$ where: Ri^2 is multiple correlation coefficients between (Xi) and other explanatory variables. For each selected continuous explanatory variable, (Xi) is regressed on all other continuous explanatory variables, the coefficient of determination Ri^2 constructed for each case. The larger value of Ri^2 the higher the value of VIF (Xi) causing higher Co linearity in the variables (xi). For continuous variables, according to Gujarati (2004), if the value of VIF is 10 and above, the variables are said to be collinear. If the value of R^2 is 1, it would result in higher VIF and causes perfect multi-collinarity between the variables. Whereas for dummy variables, if the value of contingency coefficient is greater than 0.75, the variables said are to be collinear. Similarly, contingency coefficients are computed for dummy variables from chi-square (x^2) value to detect the problem of multi-collinarity (the degree of association between dummy variables).CC = $\frac{\chi^2}{1+x^2}$: Where CC = Contingency coefficient, n= sample size. χ^2= Chi-square

value According to the test, VIF (less than 10) for continuous explanatory variables and contingency coefficient (less than 0.75) for dummy explanatory variables are below the standard limit of multi-collinarity.

3.5.3. Description of Variables

Among factors which are expected to affect household willingness to participate in conservation, the following variables have been considered in this study based on review of different literatures, past research findings and researcher's knowledge of the community in the study area.

3.5.3.1. Dependent Variable

Willingness to participate in conservation is considered as an important variable in successful conservation strategies (e.g. Cohn, 1989; Alexander 2000). The household willingness to participate in conservation of natural resource is dependent variable for the binary logit analysis which is dichotomous variable representing the household willing or unwilling to participate in conservation of natural resources. It is represented in the model by 1 for those willing to participate in conservation of Abaya Lake and 0 for those unwilling to participate in conservation of Small Abaya Lake& its catchment.

3.5.3.2. Independent Variables

It is assumed that willingness to participate in wetland resource conservation is combined effects of various factors and the expected relationship between the dependent variables is explained below. See each variable below described

This section focuses on a description of the variables specified in the logistic regression model. Using conclusions inferred from other studies, the *a priori* influence of various household characteristics was estimated.

Yrs: Represents the number of years the household has been living at the area. An individual who has lived in a given area for a long period of time had high willing to participate for the conservation of wetland. The sign was expect to be positive.

MARSTAT: This refers to marital status of the respondent. It is a dummy variable taking 1 if the respondent is single; 0 otherwise, and it is expected to have positive sign.

AWARENESS: Awareness level of a respondent on factors of wetland degradation. Awareness is dummy variable, 1 for aware respondents and 0, otherwise. It is hypothesized that awareness had positive correlation with the willingness to participate in conservation of wetlands as a result the willingness to participate in wetland conservation activities, increase (Lamsal *et al.,* 2015).

Household size: Household size was measured by the number of family members in the household. Household size would be expected to determine the labor force available to participate in the conservation of Wetland. Zidana *et al.* (2007) revealed that a positive relation between the willingness to participle in wetland conservation programs and household size was possibly caused by lack of access to land leading households with large family sizes to invade wetlands in search of land for cultivation. While they cultivate wetland they obtain wetland Benefit then they also participate in conservation as well. Therefore, large family Based on these findings, has a positive correlation was expected.

Household head Gender: Men and women engage in different activities at household level as defined by the African historical cultural domain. Household gender was conjectured to influence type of activities likely to be engaged by female or male families in as far as wetland conservation participation was concerned. Earlier studies showed that wetland conservation participation was apparently a gendered activity in some areas. Chinsinga (2007) noted that wherever wetland conservation participation competes for time and attention with seemingly

lucrative alternatives, it becomes predominantly a female activity. Households by female were therefore expected willing to participate in wetland conservation and development activities more than male households, for male households would rather focus on field crops (Chinsinga, 2007) while, Households by male were expected willing to participate in wetland conservation activities more than female households, for females would rather focus on field crops implying a negative and positive shown correlation was expected. Shown in Table above denoted as follows; (1 if male: 0 if female) to represent this predictor variable.

Household education: Education helps people to appreciate more values of wetlands. In essence, as noted by Muchapondwa (2003), education would make it easier for households to comprehend negative externalities and passive user values of natural resources. Ideally, decisions pertaining to wetland utilization are expected to be influenced by education level of households. Intuitively, a positive correlation was expected for this variable measured by the level of education attendance of the household as shown in Table above.

Household age: Age as measured by the actual number of years of the household plays a vital role in terms of land ownership cum wetland utilization in rural areas, where older household heads are expected to have better access to land than younger heads because younger men either have to wait for a land distribution or have to share land with their families. A positive correlation was therefore expected between age and wetland cultivation similar to conclusions inferred by Kapanda *et al.* (2005).But, we have to understand that cultivation is the opposite conservation.

Distance to wetland area: Wetland conservation participation was also expected to be influenced by the distance between households` fields in relation to wetland location as measured by the actual kilometers. Based on that, the more distant the fields are from the

wetlands, the drier are uplands implying the moisture content of the soil is only limited to summer seasons when there are natural rains (Peters, 2004). It therefore follows that upland farmers are more likely to face high chances of crop failure than their counterparts with fields stretching into wetlands. As a coping strategy up-land farmers are more likely to venture into wetland cultivation and besides participate in conservation and development of the wetlands to complement upland yields. Contrary to this scenario households with fields far from wetlands would find it more difficult to willing to participate in conservation and development of wetland. Because they get less value and access to wetlands due to pressure from households with fields near wetlands in relation to their counterparts. Naturally, either a positive or a negative correlation was expected.

Enforcement of community based arrangements: Community based arrangements supported by statutory instruments, provides the basis for controlling illegal activities, through setting the standards and penalty levels (A. Hailu *et al.*, 2001). At local level chiefs, head-man and village heads use different wetland restrictive strategies to control wetland degradation. What differs therefore is enforcement depending on areas. With that background, Effectiveness and Non-Effectiveness of community based arrangement was used as a standard measure to assess the influence ofenforcement on wetland restrictive measures to Participation in wetlandconservation with the implicit goal of evaluating the effectiveness of community arrangements. Positive sign was expected. Shown in Table below denoted as follows; (1=yes: 0 = No) to represent this predictor variable.

Farm size: It is continuous variable represents the amount of available land in hectare for the household living at the area. An individual who has lived in a given area for a long period of time had high willing to participate for the conservation of wetland. The sign was expect to be positive.

Trust: it is dummy variable takes (0, 1) which shows the presence of trust and The Absence of trust with in communities and individual farmer household. Trust worthiness is about creating strong ties between local communities as well as between households to incur common benefit. (Crumb, 2006; Brewer, 2003).

Mutual support: mutual assistance level of a respondent is dummy variable, 1 for help to each other and 0, otherwise. It is hypothesized that mutual support had positive correlation with the willingness to participate in conservation of wetlands. Because a member of a community feels positive and living together by keeping community norms and values as the willingness to participate in wetland conservation activities, increase (R.A. Cramb, 2012).

Occupation: This refers to the occupation of the respondent. It is a dummy variable taking 1 if the respondent is farmer; 0 otherwise, and it is expected to have positive sign for willingness to participate in the conservation of small Abaya Lake.

Income:

Variable description & hypothesis

Variables	Description of variable	Types of variable	measurement	Expected sign
Gender	Sex of respondent	Dummy	0= Female 1= male	+/-
Aware	Awareness of respondent	Dummy	1= has awareness 0= otherwise	+
mus	Availability of mutual assistance	Dummy	1= yes 0=No	+
Sot	Trustworthiness of respondent	Dummy	1= trusty 0= Non trust	+
Effin	Effectiveness of informal arrangements	Dummy	1= yes 0=No	+
Year	Number of year the household lived	continuous	year	+
Fams	size of household member	Continuous	Number	+
Income	monthly income of respondent	Continuous	Birr	+
Farms	Farm size of respondent	Continuous	hectare	+
Age	respondents age	Continuous	Years	-
Educ	Literacy level of respondent	Continuous	Year of schooling	+
Masts	marital status of respondent	dummy	1= married 0 = otherwise	+/-
Dis	distance far away from the Lake	continuous	km	-
Occu	occupation household engaged	dummy	1=farming 0=otherwise	+/-

4. Result and discussion

In this section the result obtained from household survey, which was administered face to face from September to November, (2016) and analyzed by using both Descriptive and Econometric analysis. The chapter is comprised of two major sections. The first section presents the result of descriptive analysis and the second section is about the econometric analysis result.

4.1. Socio economic characteristics of the respondents

This section describes the socio economic profile of sampled households, types of available social capital, role of social capital, social capital and natural resource management and level of awareness on factor for Small Abaya Lake and its wetland degradation. Besides, the result from close ended and open-ended questions were also presented. The data presented in Table1 and 2 below were categorical as well as continuous in nature. Therefore, the result was presented in frequency and percent. First the result of continuous variable is presented followed by dummy variables

Table2.Demographic and Socio economic characteristics of households (continuous variables)

Variables	Max	Mini	Mean	St.Dev
Family size	12	1	5	2.547
Farm size	6	0.25	0.98	0.98
Income	3000	100	726	614.8
Education	12	0	4	2.64
Age	60	18	33	8.9

Source: own household survey, (2016)

Family size: Average family size of the household was 5 members with the minimum of 1 member to maximum of 12 household members. This result is comparable with the 2010/11 CSA a national level findings of mean family size to be 5 individuals living in rular household.

Farm size: The maximum land holding per household was 6 hectare where the minimum landholding was about 0.25 hectare but, the mean land holding was about 0.98 hectare.

Income: In this study household income represents the sum of monthly earnings of all household members from different income sources. Most of household were obtained their income from livestock rearing, agricultural production, Government employment and other petty trade. For each household, the total sum of output obtained from these activities were calculated and changed into monthly income of respondent. Taking the average household size, the mean per capita income is estimated to reach 323.20 ETB per month. This finding is consistent with Yibeltal (2013) that indicated 339.61 ETB/month, conducted at Gonder. But, this is lower than Birr 535.50 monthly average per capita income reported by the IMF at country level (IMF, 2001)

Education: The highest level of educational attainment was grade 12 while, the minimum year of schooling was no grade but, mean year of schooling was grade 4. In the study area Majority of the respondents had low level of education due to that majority of the respondent households' has been living at rural area and participated in agricultural activity to gain their income.

Age: The maximum age of household in the study area was 60 years old while, the minimum age of household respondent was 18, but the mean age of household was about 33 years old. The majority of respondents were between 30 and 60 years old. This result is comparable with (Chun et al., 2012; Shan, 2012) who found that, majority of the respondents by age groups were in the

adult (31-50). Because the adult group consists of majority part of the respondents are matured enough to understand and takes part in decision making process for a particular community while youth are very energetic and fast learners. This implies that majority of the respondents are mature enough to fully understand issues concerning on natural resource conservation and participation in conservation of natural resource.

Table3.Demographic and socio economic characteristics of households (Discrete variable)

Variables	Category	Frequency	Percent
Gender	Female	40	24%
	Male	126	76%
Occupation	Farming	150	90%
	Off farm activity	11	6.80%
	Others	5	3%
Marital status	Single	15	9%
	Married	146	88%
	Divorced	2	1.20%
	Widowed	3	1.80%

Source: *Own household survey, (2016)*

Gender: Males accounted for 76% of the respondents, whereas female household respondent were 24% of the total household respondents. The reason might be males have decision-making power in the family than female. This finding is comparable with Yibeltal (2013) studied in Gondar town, was obtained 59% of the household were headed by male. Similarly a finding in Burie town carried out by Jonse (2005) obtained 81 % were male while the remaining were female headed.

Occupation: About 90.2% of the respondents were engaged in farming activity, 7% of the respondents were participated in off farming activities the while,the remaining 3% of the household farmers were engaged in other income source like, government employee, daily labor work and petty trade. The result shows that farming is the dominant economic activity for the households in the area.

Marital status of household: About eighty eight percent of (88%) the respondents were married, 9% were single, only two cases (account for 1.2%) were divorced or separated, and 1.8% was widowed. This finding is similar to Thiruchelvam and Kirupakaran (2010) who found that, majority of the households responded to the households survey questionnaire were married. Understanding of the marital status distribution was of paramount important for this study since it influences decision making process towards environmental conservation interventions. For example, Chun *et al*. (2012) claim that, married people tend to be less sensitive and more satisfied with environmental conditions than single ones and can participate in conservation and management of natural resource.

4.1.1.Willingness to Participation of households in Small Abaya Lake conservation activities.

Table 4. Willingness to participate in Small Abaya Lake conservation

	Frequency	percent
Willing	45	27%
Unwilling	121	73%

Source : own household survey, (2016)

As shown in table 8 above that household willingness to participate in Small Abaya Lake and its wetland conservation activities 73% of the household were participated in conservation activities while the rest 27% of the household were unwilling to participate in the conservation. . This might be due to that there were reasons that related to health problem, age while, some others said due to they live far away from the Lake and have another water source. But, others never participated in conservation activities because they don't have sufficient land for irrigation and some part of wetland given for investors and unemployed rural youths by government. This study is similar with (Degefu *et al*., 2014).

4.1.2. Household perceived Benefit from Small Abaya Lake and its' wetland

IN Table 8 below 13% of households perceived that they were collected fish for food, nearly 75% of the households perceived that they were relied on the lake and its wetland to fulfill their need for livestock fodder while, 31% of household perceived that they were used the lake for home consumption and 67% of the household perceived that they were relied on the lake for irrigation. In addition to this, House hold were obtained immense Benefit from Small Abaya Lake like, fodder for their animal, fishing consumption, Clean drinking water, irrigation, Medicinal plants, religious festival celebration at aside and recreational value. This finding is supported by the findings of (Sah *et al.*, 2001 and Lamsal *et al.*, 2015) done at Ghodaghodi Lake area, Nepal who found that Wetland resource use and conservation attitudes enable them participating in sustainable conservation of the Lake Ghodaghodi.

Table5.Household perceived Benefit from Small Abaya Lake & its catchment

Received Benefit	Frequency	Percent
Irrigation use	112	67%
Livestock Fodder	125	75%
Fishing Consumption	22	13%
Home use	52	31%

Source: Own household survey, 2016

4.1.3.Degradation of Small Abaya Lake & its drivers

There are many determinant factors for wetland and Lake Water resource Degradation.

In Ethiopia wetlands are under high pressure by anthropogenic drivers like, urbanization, industry, agriculture, population pressure and deforestation. Even if there were informal institutions exist, small Abaya Lake was slightly reduced and degraded. As household survey result showed that 42.2 % of households said degradation was due to population pressure, 33.2% of households said that the degradation of small Abaya Lake was due to Deforestation, 18% of households said Agricultural activities enhanced for the degradation of the lake and its surrounding while, the rest 6.6% of household said Degradation of the lake was due to over irrigation. Population pressures and Deforestation significantly affect lakes and the lakes catchment this study is in line with where Continuous increases in population harm soils, cause pollution and water scarcity, and in turn impair natural resource as well as future development this is also supported by (Wondie, 2010; Muktar Ibrahim, 2011) At Lake Tana catchment Eco-hydrology and Hydrobiology and assessing Community-based Natural Resources Management at Kenya Lake respectively. Although much of the community depends on agriculture and livestock production, water is still diverted from lakes for irrigation purpose this was also enhanced the degradation of Small Abaya Lake and its wetland. This study is in line with (Kloos

et al., 2011). During focus group discussion the participants expressed "In the study area even if there is informal institutions and participation in conservation practices like water shade practices, Tree planting programs for the management and conservation of small Abaya Lake& its catchment even though there were problems like flooding which collects west materials from ploughed agricultural field and disposed into the lake ecosystem while In addition to this government interference in fragmenting wetlands into agricultural land for unemployed rural area youths enhanced slight degradation of small Abaya Lake and its catchment." As the participants said that the community elders and bylaws couldn't able to punish government interference as well as the natural disaster of over flooding but, recently trying to minimize the effect of natural disaster by participating in water shade practice and tree planting activities. Agriculture, which typically takes the form of crop farming, is widely recognized as having deteriorating impacts on the degradation of nearby lake water. Deforestation, which may occur due to need the for fuel wood, land for livestock production, or timber or non-timber forest products, is another common threat to lake water degradation and wetland degradation. With the loss of "protective vegetative cover," a landscape loses the qualities of its soil that keep it from eroding. Deforestation leads to increased sedimentation or the filling of water bodies with sediment from surrounding areas.

Table 6. Derivers of Lake Abaya degradation

Factor of lake degradation	Frequency	Percent
population pressure	70	42.2%
Deforestation	55	33.2%
Agriculture	30	18%
over irrigation	11	6.6%

Source: Own household survey, (2016)

4.2. Types& role of social capital in the study area

4.2.1. Household membership on groups in the community

Structural social capital is measured by being awarded or Belongs to those community based associations or organizations. Respondents were initially asked if they were member of any community groups, Organizations or associations.

Table 7.Respondents membership on group's in community

Membership on Groups	Frequency	Percent
Group Based on Blood	154	92.80%
Iddir union	149	89.80%
Equb union	144	86.70%
Religious group	159	95.80%
Debo group	125	75.3%

Source : Own household survey, (2016)

Group based on Blood association: The kinship relationship that was observed in the study area is the use of blood group relation functions as roles of individuals in the family. For example, the name 'father' was sometimes used to mean a helper or somebody who plays the same function as a biological or surrogate father. Similarly 'mother' would include aunts from extended families who would fill the same roles as biological mothers. Group based on Blood had significant role in the family because there is one representative that manages the blood group relation hierarchy. For example, if someone within the group does something wrong or socially unacceptable action like theft in kind or birr, out of community norm; the local community report to for his| her father, aunt, uncle, etc before punishing according to the norm, then the family members advised the offender. If he did not accept the advice, he would be

punished in cash or other means. Finally; he wouldostracized from family member and never participated in any family related circumstances like wedding or funeral. Group based on blood relation has a 92% member which was highly understood by households.

***Iddir*:** It is an association organized by community members for matter of difficulties like funerals and other events regarded as catastrophic. During focus group discussion the participants were informed that, many individuals had given or received food and money support within and outside the community during funeral as well as wedding events. When a person died in a village, members from within and outside the village gathered flour and other necessary materials to support the bereaved family. Beside this, *Iddir*unions were also mentioned as active in helping their members; again the high level of membership on **(89.8%)** reflects mutual assistance observation. In addition to this, if someone in the member violate community norm like, keeps more livestock or harvests more lake water/ wetland grass in appropriately, the member of *Iddir* representatives punish the offender accordingly. This enhances the other community members that are not member of *Iddir*also fear-off and stop over extraction and use of Lake Abaya and its wetland resource in appropriately. This study is in line with (Dodd, 2012; Pankhurst*etal*., 2000)who found Social Capital as a means of Subjective Well-being at rural Ethiopia.

Equub: Is a savings or credit group into which members pay. This informal banking system runs on informal trust *Equub* enforce saving, promote sharing of ideas, is less bureaucratic than formal alternatives, offer loans with small interest rates, foster social cohesion, provides additional income, and finances small to medium enterprises for members. This is why that **86.7%**of the respondents were member of Equb. As key informants suggested that While, *Equb*offers loan for households, cohesion is created between groups as well as resource

degradation in search of farmland for agriculture also decreased. This study is similar with the previous study done at Addis Ababa University by (Teshome, 2008) who found that Role and Potential of 'Equub' in Ethiopia.

Labor sharing/*Debo*:Groups are common in the study areas which aware reciprocal schemes in which members are called to work on the farm of other members. Members pool their labor and resources when a household needed more labor than the household can provide. The Debo group was considered to be the most active in conducting extension activities.It is also means of working together and channel for information exchange between household farmers about extension activity as well as natural resource management, which was likely the reason for the extremely 75% membership exhibited by this organization. This study is in line with (Hoddinotte, 2005) who found that Networks and Informal Mutual Support in 15 Ethiopian Villages."

Religious group: The respondent households are membership on religious group which was about 9**5.8%.** Church and mosque members have been playing significant in mediating those who were conflicted and disagreed on personal as well as public issues. Religious leaders thought individuals of the community to avoid conflict and get together for common wealth.. The Holy books of Quran and Bible, which is the guideline for Muslim and Christianity, give the impression to support the conservation of natural resource. But most of the religious leaders like, pastors, priest and Imams were not educate their congregation and also encourage them to sustainably conserving natural resources.The Lord God made to grow every tree that is pleasant to the sight and good for food, the tree of life also in the midst of the garden, and the tree of the knowledge of good and evil. A river flowed out of Eden to water the garden and there it divided

and became four rivers. The name of the first is Pishon; it is the one which flows around the whole land of Hav"ilah, where there is gold; and the gold of the land is good; bdellium and onyx stone are there. The name of the second river is Gihon; it is the one which flows around the whole land of Cush. The name of the third river is Tigris, which flows east of Assyria and the fourth river is the Eu-phrates. The Lord God took the man and put him in the Garden of Eden to till it and keep it. The Lord God commanded the man, saying "you may freely eat every tree of the garden; but of the tree of knowledge of good and evil you shall not eat, for in the day that you eat of it, you shall die (The Bible Societies, 1971: *2).*

4.2. 2. Community groups/social organization Awareness

Table 8.household Awareness to social organization membership

Membership in local organization	**percent**	**Total belonging**
Group based blood belonging	87.3%	145
Belonging to *Iddir*	85.50%	142
Belonging to *Equb*	71.70%	119
Religious group	89.15%	148
Debo group	65%	108

Source: own household survey, (2016)

The next few questions continued this line of inquiry by asking respondents if they belong to any community groups/organizations, or clubs. Table 4 showed that a wide majority of Respondents were reported that they are member of at least one group/organization.

Group based on Blood: This has 145 members that aware about the existence of Group based on Blood. While religion group existence had89% Awareness level by household respondents. There are also *Iddir* and Debbo unions which had awareness exhibited by85.5% and 65% respectively. In addition to this Equub union has 71% awareness level by household farmers. This indicated that Very large proportions of the households has been living near the Small Abaya Lake were at least somewhat engaged in their local community organizations. This study is supported by (Pretty *et al.*, 2001) who found that Social capital is a means of community's potential for cooperative action to address local problems, as it lowers the costs of working together by facilitating cooperation and voluntary compliance with rules.

4.2.2. Cognitive social capital

When conflict arises in using common pool resource, conflict was handled by: neighbor, judicial body, community leader, local elders, and between themselves.

Table9. Cognitive social capital

Conflict resolution mechanism	Response	Frequency	Percent
Neighbor intervene conflict resolution	No	36	21.70%
	yes	130	78.30%
people work between themselves	No	37	22.30%
	yes	129	77.70%
problem Handled by Local elders	No	31	18.70%
	yes	135	81.30%
CONFLICT Resolution by community leader	No	76	45.80%
	yes	90	54.20%
Conflict resolved by judicial leader	No	90	54.20%
	yes	76	45.80%

Source: own household survey, (2016)

Local elders: played significant role in mediating those who were disagreed, conflicted to each other. 81.3% of the respondent households agreed that, when disagreement on resource utilization was arisen local elders played crucial role in negotiating among the disagreed**.**

Neighbors: are also had their own contribution in mediating the conflict as 78.3% of the respondents were reported.

Community leaders and **courts** sometimes mediate if the problem is beyond the capacity of local elders and neighbors. This study is supported by (Mohammed *et al*., 2015) who found that customary institutions were key for conflict management in Ethiopia.

Table10**.** Cognitive social capital

Perception of household on social capital	Response	Frequency	Percent
Level of trust in the last 7 years	worse	26	15.70%
	Better	131	79.00%
	The same	9	5.40%
people at the community trust and honest	Agree	119	71.60%
	disagree	35	21.20%
	Neutral	12	7.20%
Would the community get together?	No	19	11.40%
	yes	147	88.60%
Have you Engage in community meeting?	Never	21	12.70%
	Always	98	59%
	sometimes	47	28.30%

Source: own household survey, 2016

Honest: As mentioned In Table 6belowhonest indicates whether or not respondents felt that the entire communities would work together and help each other to deal with a hypothetical crisis situation that affect the entire communities. When there was disagreement in using Lake Wetland such as a fire burn many houses, someone in the agreed that they were helped to each other in time of hypothetical crisis while, 21% of the communities were not agreed and only 7.2% were neutral.

Social trust: Approximately 79% of household respondents perceived that Level of trust at the community of Small Abaya Lake was better while 16% of households perceived that it was becoming worse and only 5% of households perceived that it was at the same status. During focus group discussion the one participant said ‘when we use our common resource like wetland of small Abaya Lake nobody keeps more than the limited number of cattle and Nobody couldn’t kept cattle on wetland during rainy season ”. This is why that level of trust is becoming better due to strong enforceable sanction availability. This study is supported by(Crumb, 2006; Brewer 2003).

Mutual support: About 88.6% of households perceived that the community gets together in matter of crisis while only 11.4% of the respondents were not perceived that the community gets together in matter of crisis. At the community nearby small Abaya Lake the household share Labor, money and material if someone at the community incur crisis.

Civic Engagement: About 59% of the respondent households were engaged always in community meeting while, 28.3% of households were engaged sometimes and the remaining 12.7% were never engaged in community meeting. Those who engaged in community meeting had developed knowledge on natural resource management because engagement in community meetingenhanced them to exchange information about extension activity as well as natural resource management. This study is in line with the study done by (Helber, 2001) who found that Engagement in community meeting issue is started with recognizing that the households have tradition through organizing collective action.

4.3. Social Capital and Natural resource management

The selite people have developed a diverse range of rules, regulation, customs, traditions, norms, values & practices for the conservation of territorial living, land use and conservation of forests, Ponds, rivers, wetlands and grazing land. The rules are created by people for the people and are often the target of attempts to solve problems. Similar studies show that; rules are statements about what actions are "required, prohibited or permitted and the sanctions authorized if the rules are violated" (Ostrom, 1994). Key informants, Kemal and Muktar(December, 2017) stated that, by-laws were enforced for the protection of the common property resource under the Local communities of Selite tradition. These bylaws are worked by enacting various rules and by the entire community working together under the leadership of Local community elders (*Baliqi*). The rule and regulation concerning Small Abaya Lake and its wetland conservation is to encourage the development of the Lake Abaya and its wetland, conserve properly and use the remaining limited wetland resource of Selite.Abaya Lake & its surrounding resource conservation rules were developed and transferred from time to time by Local elders (*Baliq*). This study is in line with (Desalegn, 2013) who found that Local communities had rules to protect water resource. For example, in each local community a member of household head or any one family member should participate in conservation activities; like, tree planting, terracing and other water shade practices. This study is consistent with the previous study of Tadesse, (2004), done at, Guji people Oromia region who found that there were rules also to protect trees, animals, water and grass. In addition to above mentioned similar study was done by (Williams 2002) who found that for successful conservation and management of natural resources, the participating local communities should be fully aware of the importance of wetlands as parts of water cycles, as well as the nature and effects of human impacts.

During focus group discussion, key informant interview and household survey, the households expressed that there are informal norms or institutions that used to govern the management and use of small Abaya Lake and the surrounding wetland. Theses rule of behavior either restrict or allow in using and encourage participation in conservation of Small Abaya Lake as well as its surrounding. Informal rules (Bylaws) were unwritten but agreed up on by the local community in order to punish those who were willing to do things that are not allowed to be done at small Abaya Lake and its surrounding. Community based bylaws effectively punish the one who did out of the agreed statement. For example, if someone ploughs his/her Agricultural land vertically he/she would be punished birr 50 for the first time, for those who did not participated in conservation activities like, tree planting, terracing and other water shade practice, he/she advised for the first time, if repeated he/she would be punished birr 100 for *Iddir* members; finally, he/she would be out of *iddir, Equub* and *debbomembership*. In order to protect the lake and it's surrounding from degradation; the household were applying ordered irrigation schemes, participation in conservation activities, prohibiting west disposal within the lake and its surrounding. Beside these they were also restricted number of cattle kept and season of harvesting wetland resource. Bylaws played a significant role in sanctioning those who didn't respecting the community base informal agreement. This study is in consistent (Mazzucato & Niemeijer, 2002)who found that Local institutions are usually rooted in community social capital, rather than external, top-down decision-making processes, hence they are dynamic, flexible and responsive to societal and environmental change, and have been regarded as important 'buffering' mechanisms that promote sustainability and resilience at the environment society interface. But, as key informants said that currently informal arrangements are becoming weak, because government fragments wetlands and Lake Water for investors and local

unemployed youths to change in to agricultural land. As a result, local elders, religious leaders and society's norm lost its power. This study is supported by (Demise, 2002; wood *et al*., 2002) done at Lake Tana catchment who found that government interfere on community norm exhibited immediate degradation of wetland and the catchment resources while,(Belayneh, 2015)explored ill-intentioned government policy have eroded customary resource management, conflict resolution and livelihood resilience practices, and paved the way distrust and noncooperation; resource degradation; livelihood vulnerabilities, and perpetuation of conflicts in the area.

4.3.1. Bylaws and penalty system for the conservation of small Abaya Lake &its surrounding

- Every household farmer has to participate in conservation activities like tree planting, terracing and other conservation activities.
- Advice is given for the first time but, when the action is repeated, he penalized birr 200 finally, then the offender socially excluded.
- It is prohibited to plough the land vertically near by the lake.
- The offender punished Birr 200 for the first time finally withdraws from Iddir and Equb.
- Each community must attend every community meeting.
- Punishment of birr 50 for the first time while if the action is repeated, reported to social organization members. Planting eucalyptus trees is strictly forbidden because it consumes high amount of lake water and reduce the growth of wetland grass.
- If a community member plants eucalyptus trees, the case shall be seen in front of the Iddir leaders and the offender punished 500 birr for iddir and equub leaders.

- ❖ The irrigation and plough must be undertaken by minimum of 200m far away from the lake and its surrounding.
- ➢ If plopping and irrigation is undertaken less than 200m away from lake and its surrounding, the offender advised for the first time, next time he dismissed from Iddir and reported to district Agricultural office.

4.3.2. Bylaws and penalty system for the utilization of small Abaya Lake &its surrounding

- ❖ It is not allowed to keep more cattle like, Goat, oxen at a time rainy season.
- ➢ The owner punished birr 100 per cattle for the first time then if he repeat it he advised by Iddir members.
- ❖ For every water distributor and irrigation water guard the payment should be done on the agreed time.
- ❖ All members of community should contribute for the salary of water distributor and guards.
- ❖ Irrigation scheme is based up on order of communities and villages.
- ➢ If order of irrigation is not by order, an individual will be advised for the first time, punished 500 birr in cash finally, dismissed from local Iddir and reported to higher government body as an illegal person.

4.4. Determinants of the willingness to participation of households in Lake Abaya conservation

In this section the result of factors that influenced households' participation in conservation of Small Abaya Lake& its surrounding is presented. The section is comprised oftwo major sections. First the result of the data diagnosis is presented this is followed by section that deals with the parameter estimates of the determinants of willingness to participation in Lake Abaya conservation.

Before taking variable into logit model, prevalence of multi collinarity among continuous and dummy /categorical variables was checked. Multi collinarity problem arises due to a linear relation between explanatory variables and non unique estimation of parameters.The solution to this is dropping the variable creating the problem. In this study, since VIF values are less than 10, there were no series problem of multi collinarity among explanatory variables. Similarly, contingency coefficients were computed for dummy/categorical variables from chi-square value to detect the problem of multi collinarity (degree of association) between dummy/categorical variables. So, in this case there were no series problem of multi collinarity has been seen or observed.

Goodness of fit of the model

For the participation in conservation of Small Abaya Lake and its wetland, the goodness of fit of the model is given by R^2 = 0.66 (66%). The result of χ^2 (log likelihood ratio of chi- square) -36.14 at 14 degree of freedom and the predicting capacity of the model is 81.25%.

The regression model result in table 10 show that among the 14 explanatory variables incorporated in the analysis only seven variables are found to be significantly influenced the willingness to participate in conservation of Small Abaya Lake and Its wetland.

Table4.Determinant factors for willingness to participate in conservation

Variables	Coef.	Std.er	P>|z|	Marginal eff
Age	-0.0715	0.04118	0.072*	-0.011
Occupati	0.53425	0.53949	0.327	0.08
Awarene	2.35366	0.7879	0.003***	0. 392
Farmsiz	0.32331	0.23933	0.166	0.049
Educ	0.34249	0.14726	0.012***	0. 053
Merital	-1.0188	0.63003	0.121	-0.156
Familys	0.05465	0.13827	0.695	0.008
Dist	-2E-05	0.00023	0.924	-2.2E-05
Mus	2.08566	0.85611	0.005***	0.295
Sot	1.6544	0.74408	0.049**	0.29
Income	-0.0031	0.00078	0.002***	-0.0005
Gender	-0.7108	0.74775	0.309	-0.096
Year	-0.0216	0.02263	0.368	-0.0033
Institu	1.74139	0.68057	0.035**	0.295
_cons	4.60397	2.27355	0.024	0.14788

y = Pr (conserve) (predict) = 81.2%Pseudo R^2 = 66% No, of observation=166

LR chi2 (14) = 142.55

Log likelihood = -36.14 Prob chi^2 =0.0000

Note: ***, ** and * significant at 1%, 5% and 10% probability levels, respectively

Age: As shown in (Table10) above age of household head was statically significant at 10% probability level. The negative coefficient and significant effect of household age indicates its negative influence on willingness to participate in wetland conservation which was as expected. The marginal effect estimates shows, that keeping the influences of other factors constant, a one year increase in the age of the household head reduces the probability of accepting wetland conservation by 1.088%. This may be due to that the older household feel about they are getting

agedtheir and participation in conservation of wetland might not give additional satisfaction. Similar findings were (Zhang *et al.,* 2011; Ghosh *et al.,* 2013; Sakuria*et al.,* 2015) whom noted a significant and negative relationship between age of household and the probability of participation in wetland resource conservation.

Awareness on causes of wetland degradation

The result shows that awareness of the household head on wetland degradation is statically significant at1%. The marginal effect estimates shows that keeping the influences of other factors constant, Household that are aware about the derivers of wetland degradation were 39.2% times more likely participate in conservation of wetland than those who have not awareness about derivers of wetland degradation. Thus, the calming factor of degradation and deforestation enhanced households to be more aware about the negative consequence of resource degradation; hence, this was enhanced them to participate in conservation of wetland resource. Similar findings were obtained by (Lamsal*et al.,* 2015; Jayp*et al.,* 2001; Bewketet *al.,* 2006)

Mutual support: It was statically significant and positive at 1% level. Householdwho perceived the existence of mutual support were 29.4% times more likely to participate in conservation of wetland than those who didn't perceive the existence of mutual support. A household who was engaged in mutual assistance had more likely participated in conservation of wetland. This finding is consistent with (R.A. Cramb, 2012) who noted a significant and positive relationship between mutual support and participation in community Land care groups in the Philippines.

Effectiveness of community based institutional arrangements (Bylaws)

Effectiveness of local informal institutional arrangements was statically significant at 5% level. The marginal effect estimates shows, that keeping the influences of other factors constantin cases

of where the local institutional arrangements, the willingness to participation 10% times more than when the local informal arrangements were not effective . This is due to that the institutional arrangements that are a key mechanism which restricts illegal activities and allows things that are not forbidden in conserving and utilizing wetland resource. This study is consistent with (Badal*et al*., 2006) who noted a significant and positive relationship between availability and effectiveness of local institutional arrangement of household and the probability of participation on conservation of wetland.

Income: Total Income was statically significant (p=0.002) and significant at 1% level.This means that for a birr increase in total income of the household, the probability of participation in conservation decrease by 0.05%. The coefficient is negative and statically significant at 1% level. The marginal effect shows that an increase in a Birr in Total household income, the likelihood of participation in wet land conservation was decreased by 0.05%. This might be due to the fact that farmers with higher Total household income tend to have off farm income and not worry about conservation rather thinking about taking more land from wet land for investment in order to maximize additional utility and productivity. This finding is consistent with the study undertaken by (Zhu*et al.,* 2016).

Education: Level of Education was statically significant at 5 % probability level positive. Holding other variables constant, the marginal effect result shows that for each additional increment of year of schooling, the probability of participation in conservation of wetland will increase by 5.3%. The result may be when household learn more, they know and aware more about the benefit of conservation. Farmers with higher education attainment had stronger Environmental protection knowledge and were also more receptive to new idea. The coefficient

of household education was significant and positively related implying that the more educated the household would be, the more likely that household would participate in wetland conservation rather than cultivation. Educated households enjoy multiple and better options to trade their labor as compared to their uneducated counterparts. Educated households logically would be expected to be more risk averse and skeptical to engage in illegal activities related to natural resource conservation compared to lower year of schooling households. This study is consistent with the study under taken by (Guan et al., 2015& Chun *et al*., 2012) while, Similar finding was also obtained by (Muchapondwa, 2003) who noted a significant and positive relationship between education level of household and the probability of participation on conservation of wildlife at local level attributing such behavior to access of information and ability of educated households to comprehend more seriously negative and positive externalities associated with such schemes.

Social Trust: Social trust was statically significant at 5% level. The marginal effect shows that, holding other variables constant, people who perceive the existence of trust within the community were 29% times more likely to participate in conservation and development of wetland and it's surrounding than those who didn't perceive the existence of trust. Because trustworthiness is about creating strong ties between local communities as well as between households to incur common benefit. As someone is trusty to his community in utilizing and participation in conservation without absent; the existence of trust is used to reduce cheating as well as transaction cost among the household. This study is consistent with study conducted by (Crumb, 2006) &(Brewer, 2003).

5. Conclusion and Recommendation

5.1. Conclusion

The result shows that Abaya Lake has been conserved by shared values and understandings among the community in the area. The study revealed that wetlands indigenous knowledge, and bylaws as part of social capital ensured management of wetland for extended time. In this regard, trust, mutual support, bylaws, membership on village level organizations, conflict resolution mechanism and civic engagement are key tool for natural resource conservation and management. Thus, community based shared values are transferred from generation to generation and embedded with in society in guiding the actions are all allowed to do and not in utilization and management of natural resource.

Even if there is community based natural resource management arrangements in the area, wetlands of the study area are under threatened condition due to population pressure, deforestation, and Agricultural expansion and over irrigation, due to government intervention on community based embedded social capital and natural disaster. Regarding the willingness to participate, much of the household were willing to participate in the conservation of wetland. However, there are factors that determine the willingness to participate in the conservation of wetland are: education, Mutual support, effectiveness of community based embedded institutional arrangement, awareness, age, Trust and income. This result implies that local communities are willing to accept participatory wetland conservation initiatives. Participation of local community in management of wetland is likely to improve the natural resource and the livelihood of local community

5.2. Recommendation

Based on the results of this study the following recommendations wereput forward.The result shows that exploring way of enhancing the contribution of wetland to the environment will increase the understanding and perception on various issues pertaining natural resource towards attaining standard local community's livelihoods

Therefore, the government should have to empower and take into consideration the local communist's indigenous natural resource management practice and provide awareness. The result shows that the majority of households were willing to participate in wetland use and management.

It is better to share the benefit of wetland equally to the household for sustainable conservation, use and management of wetlands.

As wetlands are subject to competing uses from different sectors, for sustainable management of the wetlands the government shouldensure that, engagement of other stakeholders including government and non-government organization planning and use values design of wetland for sustainable development. The findings from this study show that the role of indigenous institutions is immense therefore, the government should have to integrate the role of local elders, religious leaders and community based informal organization in natural resource conservation.

The findings show that the importance and strength of social capital has been getting attention over the last decades. Consequently, this has been resulted in degradation of the small Lake Abaya and its surrounding. Hence, this calls for integrating social capital (indigenous with the formal institutional environment).

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Appendix I

Table 5.Contingency coefficient for dummy independent variable

	Awareness	occupa~n	marital	Mutual sot	gender	Ins effe	
Awareness	1						
Occupation	-0.1199	1					
Marital	0.0893	-0.0536	1				
Mus	0.4274	-0.0725	-0.1389	1			
Sot	0.2562	-0.1033	-0.0287	0.2951	1		
Gender	0.0539	0.0584	0.0578	0.06	-0.1072	1	
Ef info institu	0.3293	-0.0469	-0.0341	0.3692	0.4427	0.0963	1

Table 6.Variance inflation factor for continuous independent variables (vif)

Variables	VIF	1/VIF
Educ	1.44	0.694432
Income	1.39	0.720480
Fams	1.28	0.779639
Lands	1.28	0.782391
Age	1.22	0.817909
Year	1.18	0.844106
Dist	1.10	0.909645

Appendix-2

Mohammed Essa is studentat Hawassa University conducting Graduate Level Master thesis in Natural Resource Economics and policy. Thesis research study on Role of Social Capital in Natural resource conservation: The case of Small Abaya Lake in Siltie Zone. In order to analyze determinant factors affecting conservation participation, researcher is conducting Survey interviews with households around the Lake. The households' are randomly selected, in order to get representative data from the various communities around the Lake. You have been randomly selected from this community to be a respondent and you have to reply honestly the questions asked below.

Section I: SOCIO-DEMOGRAPHIC QUESTIONS

Name of the respondent/household head

Age---- years

Sex/gender:_____1. Male 2. Female

4. Education: ……..

5. Family size……..

6. Marital status: 1. Single 2. Married 3.Divorced 4.widowed

Occupation: (list all) _____

7. How much did you get monthly household income in Birr?

6. How many people live in your house (including you?)

4. How long have you been settled in this area?

Do you know about Lake Abaya? 1. Yes 2. No

13. How far away do you live from Small Lake Abaya?

Have you got any benefit from Abaya Lake & its surrounding?

1. Yes 2. No

14. If No, stop here, if yes,

12. Among the following which benefit did you get from Abaya Lake and its surrounding?

Note: More than one choice is possible

Livestock Fodder	
Irrigation use	
Fishing Consumption	
Home use and others if any	

How do you evaluate the status of Lake Abaya in the past years?

Degrading b. improving c. no change

If degrading, do you know what factors contribute for its degradation? 1. Yes 2. No

If yes, which factor among the following are sever? Note: more than one choice is possible

Deforestation	
population pressure	
Agriculture	
Over irrigation	

Were there any measures taken to reduce its degradation so far? 1. Yes 2. No

If yes, what are the measures?

Willingness to participate in the conservation

Are you willing to participate in the conservation of Lake Abaya&its surrounding?

1. Yes 2. No

If yes, in which conservation activity did you willing to participate?

If No why do you unwilling to participate in the conservation & development of the Lake &it's surrounding?

What challenges did you think thatdetermine people'swillingness to participate in the conservation and development of the lake?

Social Capital Questions

Group membership

Of the groups/associations/organizations listed below (check one for each A and B)

13. Are you aware of this group's existence in your community?

14. Do you belong to this group?

Groups/Associations/Organization

A. Aware of No Yes B. Belong to No Yes

Community organizations	Aware of Yes	NO	Belongs to YES	NO
Religious group				
Group based on blood relationship				
Debbo union				
Equb				
Iddir				
Others, please specify				

Social trust

16. How do you evaluate the community around Lake Abaya in terms of trust among each other?

Do you think in this community people generally trust one another?

A. yes B. No

If yes, explain?

17. Most people community is honest and can be trusted

a. Agree B. Disagree C. Neutral

18. How do you evaluate the level of trust among the members of the community (Do you think over the last few years' level of trust?

A. Becoming better B. Becoming Worse C. The same

Mutual support

19. Do you think that this community gets together one another in matter community problem?

A. yes B. no

Conflict resolution

22. If there is village problem scenario in relation with the utilization of Lake Water& surrounding Grazing land how problem handled?

	Yes	No
People workout between themselves		
Neighbors intervene		
Community leader		
Judicial leader		
Religious leaders		

CIVIC ENGGEMENT

23. Have you ever joined together with others in the community to address common issue like, village level meeting in the past year?

A. Never participated B. sometimes C. Always

Are there any community based informal institutional arrangements in use and management of the lake?

1. Yes 2. No

If yes, mention what are the arrangements?

Explain how the institutional arrangements operate.

How do you evaluate the performance of community based informal institution arrangements (Bylaws)?
A. Effective B. not effective

Appendix 3

Check list for key informants

Do you know about Lake Abaya?

Is there any social capital in the management of Lake Abaya?

What are bylaws for the utilization and management of Lake Abaya?

How the informal institutional arrangements operate?

Are there any community based informal institutional arrangements in use and management of the lake?

What conflict resolution mechanisms are when there are disagreement in the utilization of Abaya Lake?

How do you see the role of community organization for the conservation of Abaya Lake?

Appendix 4
Check list for focus group discussion

What are the major cases of Abaya Lake degradation?

What are the major driverrs for the degradation of Abaya Lake?

What conservation measures are taken?

How do you evaluate the participation of local community for the conservation of Abaya Lake?

What benefit did you perceive from Abaya Lake?

Do you think that the people near Abaya lake participate in the rehabilitation and conservation of Abaya Lake?

Are there any community based informal institutional arrangements in use and management of the lake?

If yes, mention what are the arrangements?

Explain how the institutional arrangements operate.

How do you evaluate the performance of community based informal institution arrangements (Bylaws)?

Biographical sketch

The author***Mohammed Essa*** was born in 1992 in Debubgoto kebelee, siliti woreda, silitie Zone, SNNPR, and Ethiopia. He attended his primary school (1-7) at goto primary school and junior secondary school, grade 8 at Gebaba primary school, silitie Zone. Then, he completed his secondary education at siliti high school (9-10) and completed his secondary high and preparatory education at siliti high School in 2012. He joined hawassa University in 2011 and graduated with B.Sc. degree in ***Natural Resource Economics and policy***in July 2013. He was then employed as an expert in Tora Primary hospital as purchaser in Lanfuro woreda, silitie Zone, and SNNPR. Soon after, he was sent to Hawassa University, Wondo Genet College of Forestry and Natural Resources for his M.Sc. study under the program of **Natural *Resource and Environmental Studies*** with specialization in ***Natural Resource Economics and policy*.**