

Full Length Research Paper

The psycho-social context of Lake Ziway/Dembel: Oromia Regional state, Ethiopia

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The general purpose of this study was to organize psycho-social information pertaining to some issues. These include: Local peoples' awareness and perception of risk of ecological problems associated with Lake Ziway/Dembel; the issues of community participation and mobilization in resource conservation, preservation and sustainable use; psycho-social consequences of the adverse climatic happenings in the lake area; and impacts of eco-systemic changes of the Lake on local livelihoods. Besides, this study was undertaken so as to suggest further research and facilitate academic discussion, thereby contributing for national environmental policy consideration and mechanisms of intervention. The main tools of primary data collection used in this study include; in-depth interviews, Focus Group Discussions, direct observations and questionnaire. Questionnaire items were administered to members of the local community with varying socio-demographic composition, teachers and high school students and local governmental officials. The results indicated that people as well as other stakeholders in the Lake area are familiar with eco-systemic changes involving the Lake. This indicates that there is an already existing perception of the risk on behalf the community in Lake Ziway area. It was possible to infer that people who have based their livelihood on the Lake are in a vulnerable context. The study indicates that there are some psycho-social impacts of the environmental troubles associated with Ziway/Dembel lake.

Key words: Lake Ziway/Dembel, Risk perception, local community, sustainable utilization, conservation, psycho-social impacts, community mobilization, participation.

INTRODUCTION

Addressing climate change is arguably one of the most pressing tasks facing our planet and its inhabitants. The Inter-governmental Panel on Climate Change (IPCC, 2007) defined climate change as "any change in climate over time, whether due to natural variability or as a result of human activity." More broadly, climate change refers to changes in atmosphere (gaseous envelope surrounding

the earth), hydrosphere (water on the surface of the earth), cryosphere (snow, ice, and permafrost on and beneath the surface of the earth and ocean), land surface, and biosphere (ecosystems and organisms living in the atmosphere, land, and oceans) etc. What is unique about the current global climate change, as relative to historical changes, as asserted by APA (2009) is the

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causal role of human activity (also called anthropogenic forcing) and the current and projected dramatic changes in climate across the globe. According to McMichael (2003), the long-term good health of populations depends on the continued stability and functioning of the biosphere's ecological and physical systems, often referred to as life-support systems. Lake Ziway is one of the four large lakes found in Ethiopian Central Rift Valley (CRV). The Ethiopian central rift valley is part of the East African Rift, an active continental rift zone, which goes along East Africa from the Red Sea to Mozambique. The CRV is situated in the administrative regions of Oromia and the Southern Nations Nationalities and Peoples Region (SNNPR), and covers an area of approximately 10,000 km². The area encompasses a chain of four large lakes (Ziway, Langano, Abyata and Shala) and streams that are spatially and temporally strongly interlinked (Ferrer et al., 2008). The Rift Valley is one of the environmentally very vulnerable areas in Ethiopia. The lakes are highly productive, harboring an indigenous population of edible fish and support a wide variety of other aquatic and wild life. They are globally significant freshwater ecosystems containing important areas of both terrestrial and aquatic biological diversity, and most are becoming degraded as a result of human activities (Lake Ziway and their influent rivers are used for irrigation, flower industry, soda abstraction, fish farming, domestic use and recreation) (Ayenew, 2004; 2007). Lake Ziway has long been used as source of town's water supply, small scale irrigation, bathing, animal watering, domestic water use, fishery and eco-tourism. There is a lot of deliberation about floriculture industries located at the shore discharging untreated effluent directly into the lake; as a result excessive fertilizer and pesticide residue from the farm is deteriorating the water quality as well as the aquatic life (Malefia, 2009). Urbanization, industry, agriculture, and deforestation are the major anthropogenic drivers of many more specific processes and outputs which degrade lake water quality in Ethiopia. Degraded lakes have numerous social, economic, and ecological impacts. Poverty and underdevelopment in Ethiopia underlie the anthropogenic forces that degrade lakes (Graichen, 2011).

The risk literature has widely studied individual sources of threat perception. There are two main classical theories used for explanation of perceived risk: the psychometric paradigm and cultural theory (Sjoberg 2004, Sjoberg et al. 2004). The psychometric explanation, drawing on cognitive psychology, was developed by Fischhoff et al. (1978). The basic assumption of this approach is that threats and risks are in reality interpreted or perceived by individuals. In other words, individual threats are considered to be stimuli to which individuals respond (Slovic, 1987 as cited in Kateřina (2012); Sjoberg, 2000; Sjoberg et al., 2004). The psychometric model proposed by Fischhoff (1984) addressed how human risk perception is significantly

influenced by the physical properties of risks (voluntariness, familiarity, and catastrophic consequences), as well as psychological and cognitive factors (dread, experience, benefits associated with the risks, controllability, and knowledge). Based on this perspective, various characteristics of the possible threats and risks are considered to be the principal factors determining how much people feel threatened or at risk. The second theory that belongs to the basic explanatory framework of risk perception is the so-called cultural theory. Unlike the psychometric paradigm that looks at characteristics of risks themselves, the cultural theory focuses on individual attitudes and values that can influence the levels of perceived risk (Sjöberg, 2003; Peters and Slovic, 1996). The cultural perspective was introduced into the risk perception literature by Douglas et al. (1982). According to this perspective, the perception of risk is driven by more general attitudes towards the world around us. Culturalists assume that people have specific worldviews that determine their interpretations of the surrounding world. In contrast to the psychometric theory, possible risks and hazards are not expected to influence individual attitudes directly but through interpretative schemata (Peters and Slovic, 1996). Especially relevant to the explanatory potential in cross-individual research is that people naturally differ in their worldviews. Early risk perception research centered on the idea of a 'knowledge gap' between the public and the experts (Hilgartner, 1990; Wynne et al., 1996 as cited in SCU, 2014). It was assumed that if the public could access and understand all the facts of a situation, their ideas about risk would tend to match those of the experts (Hansen et al., 2004; Touili et al., 2014). However, this idea has been dismissed and researchers now recognize that knowledge is by no means the only factor determining perceptions of risk (Touili et al., 2014; Renn and Rohrman, 2000). Rather, risk perception is a complex product of innate biases (as discussed in the above Section) as well as social, cultural, political and emotional factors (Touili et al., 2014; Renn and Rohrman, 2000). The third approach is the interdisciplinary paradigm that applies several concepts to explain risk perception. Its most distinct concept is Kasperson's social amplification of risk framework (1988), a systematic conceptualization of how scientific risk is influenced by psychological, social, institutional, and cultural processes. This model explains two processes associated with risk perception: first, risk perception is affected by a variety of social processes such as social institutions' roles in communicating risk-related information, a range of communication channels existing in societies, institutional behaviors, and sociopolitical processes; second, risk messages are interpreted and perceived by individuals or society as a whole.

Drawing on the above ideas, the environmental tribulations posed on to Ziway/Dembel Lake are multifaceted and complicated that dictate the involvement

of various bodies including, local communities, researchers, GOs and NGOs and other environmentalists. Any effort to preserve or conserve commonly owned resources should give due emphasis to the basic social fabric of the concerned social group to bring significant interventional outcome. This has to begin from researching the nature, causes and consequences of the issue that have to do with the social, behavioral and cultural life of any social system. The local people (community) should be the primary sources of information for they know their surrounding environment for long; and local wisdoms of resource conservation and preservation should be thoroughly identified. Local peoples' perception and awareness towards natural resource management and environmental risk have to be seriously studied. Understanding the differences in the risk judgments of residents of industrial communities potentially provides insights into how to develop appropriate risk communication strategies. The causes determining laypersons risk judgments and perceptions need to be thoroughly studied in order to create effective risk communication between governments and the public. Comprehending laypersons fundamental understanding of risk-related judgment can help risk communicators achieve the following: effectively establish communication efforts, properly select pieces of information and their formats, and foster information sharing among relevant parties (Janmaimool and Watanabe, 2014). Governments mostly make decisions regarding the development of industrial activities based on experts' scientifically estimated risks; however, local residents' risk judgments are not well understood or considered. As a result, industries have been growing despite public protests. Local people should have the circumstances through which they can improve their own knowledge and awareness regarding the actual and potential dangers and consequences of environmental problems. This can be realized through awareness creation educations, experience sharing and other means of communicating information such as the mass media. Members of the public are often presented with a large amount of information on a topic that concerns them and require some way of weighing up that information if they want to reach a conclusion about relevant risks. In general, the public relies on what are called 'intuitive heuristics' or - more commonly - rules of thumb (Science Communication Unit, 2014). The other key issue in natural resource conservation and preservation is that of community mobilization. Beyond contributing in problem identification and search for mitigating way outs, the local people can also play an important role through the accumulated local wisdoms and skills and man power.

MATERIALS AND METHODS

Exploratory study design was employed since the purpose of the study was to explore the knowledge and perception of local

residents in and near Ziway/Batu town regarding the prevailing climatic problems associated with the lake, psycho-social impacts of the problem, the participation of local people in contributing for mitigating the problem, and exploring the impacts of the problem on local livelihoods. Mixed research approach (that is both qualitative and quantitative approaches) was utilized in generating relevant data to meet the goal of this preliminary/ baseline study. The main tools of primary data collection used in this preliminary study include; in-depth interviews, Focus Group Discussions, direct observation and questionnaire. Interviews (both telephone interview and face-face interview) with members of the local residents around Lake Ziway/Dembel have been conducted. Eight FGDs were conducted in the data collection process. The focus groups comprise teachers, members of local people and local government authorities. In-depth interviews were conducted with local government officials, community leaders, and environment protection and conservation experts in the study area and health professionals. There was also systematic observation of fishing activities, local transportation service provision activities, the lake itself and damage caused by human interventions, and Meki River (tributary to the lake). Three hundred questionnaire items (later used to triangulate qualitative data) were filled out by members of the local community with varying socio-demographic composition, teachers and high school students and local governmental office holders. The questionnaire were used to address risk perception, opinion of the local community members on the future status of the lake, psychological impacts of lake damage on the local community members, endangerment of local livelihoods, people's sense of ownership and efforts made to mitigate the crisis. Besides primary data, secondary was also thoroughly reviewed in compiling this report. Quantitative and qualitative data were triangulated to build up a fully rounded analysis. Microsoft Excel was used for data entry and storage before importing to the Statistical Packages for Social Science (SPSS Version: 23.00) for generating quantitative data while qualitative data was thematically analyzed. Qualitative information generated using qualitative data collection tools, is analyzed manually by carefully recording, transcribing, organizing, and summarizing in to written form. Since the discussions and interviews were made in the local language (Amharic and Afan Oromo), the information collected was directly translated to English by the researchers.

RESULTS AND DISCUSSION

Risk perception of the surrounding community on biodiversity changes involving lake Ziway/Dembel

Awareness

A total of four measures (question items) were used to create a holistic assessment of risk perception, covering knowledge and /or awareness dimension. As presented in Table 1, respondents were asked whether they have heard of any biodiversity change around the lake. Majority (66%) of our respondents reported to have some information and the rest (33%) respondents have never noticed and heard of any deterioration and decrements on the lake status for the past 12 months. Similarly, according to the data obtained, 70% of them are certain that there are changes on the lake status while only (30%) were not certain to any changes in water quantity, salt level, catchment size, fish variety and quantity level

Table 1. Respondent's knowledge/awareness regarding the impact of climate change on the lake.

Knowledge /Awareness and Risk	Responses	Frequency	Percentage
Have you received any information about the situation in the Lake in the last 12 months (water quantity loss, diminishing fish species, salt level, catchment decrease, recurrent weed invasions)?	Yes	200	66
	No	100	33.3
	Total	300	100
I am uncertain that any change is really happening to the lake	Yes	90	30
	No	210	70
	Total	300	100
The lake water is more polluted now than ever before.	Yes	300	100
	No	--	--
	Total	300	100
The lake environment is a source of health problems for the surrounding community	Yes	260	86.7
	No	40	13.3
	Total	300	100

among others on the lake. However, when it comes to specifically judging whether or not the lake water is polluted than ever before, all of the respondents seems to be aware of it and rated the lake water as polluted than ever before the past. Moreover, almost 87% of our baseline respondents felt that the lake environment is a threat to their feature health and wel -being.

Similar risk perception appraisal opinions were also reflected from local farmers and fishers participated in many FGDs. Most of the local residents in *Grissa* village near *Meki* town generally appear to be largely aware and familiar with the many changes and risks posed on the general and to their livelihood in particular. As reflected by FGD participants, they are being affected directly or indirectly by the gradual deterioration of the lake status. In order to engage people in a successful climate adaptation and successful natural resource conservation efforts, understanding public perceptions of climate change risks, is a prerequisite. Scholars like Biswas et al. (2004); Gebremariam, 1998 as cited in Graichen, 2011) asserted that continued education and awareness raising among the society are imperative for successful and strong collaborative actions needed for the water shade management of lake Ziway/Dembel.

Perceived behavioral control

Regarding the degree of perceived control of the problem, a clear majority 240 (84%) of respondents perceive most of the lake water and aquatic species changes occurring on the lake are not controllable. Only 60 (20%) of participants in this study responded “yes” to the item which was asked to determine their opinion whether such eco-systemic changes around the lake are controllable or not. Additionally, around 68% of participants were found to be skeptic about their individual contribution and capability on the possibility of

bringing any positive change on the lake and solving its problem. However, some respondents up held affirmatively on individual role as a having significant contribution to any mitigation effort aimed at reversing the lake status.

Similar views were found among FGD participants in *Dugda-grisa* village regarding the item which instigates perceived behavioral control of the problems associated with the lake on behalf of local people. Farmers and local elders in in-depth interviews and FGDs raised their uncertainty about whether the ecosytemcic problem on lake Ziway could be solved or not (Table 2).

Perception of vulnerability

Study participants were asked to indicate their view on which they believe are more victims because of the future danger posed on the lake. Opinions seem shared as about 80% of respondents responded that each and every segment of the population in Ziway/Batu town and the surrounding areas is vulnerable. Contrary to this, 17% of them felt that farmers and local fishers are more victims (Table 3).

Psycho-social and economic impacts of the Lake's damage on the surrounding communities

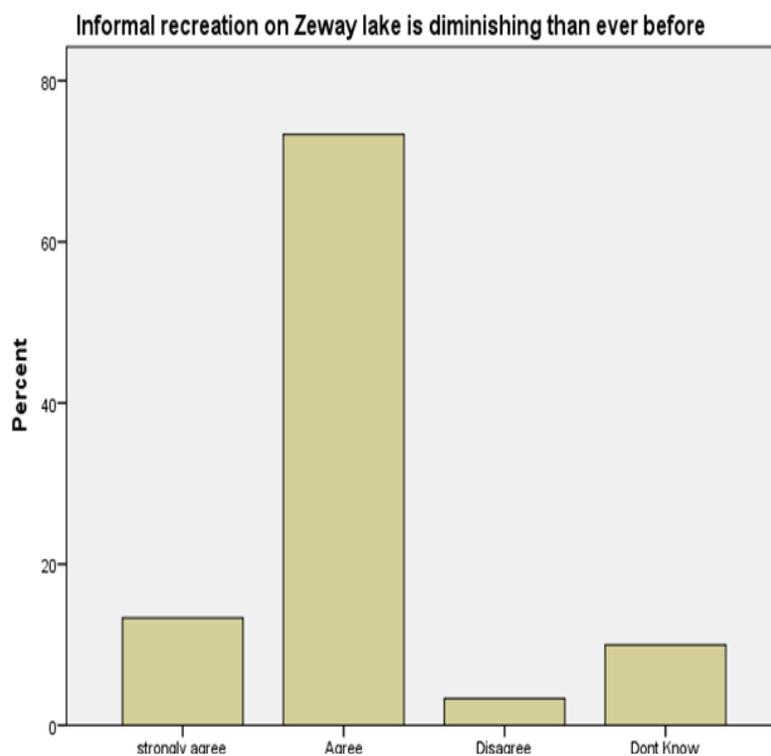
It is obvious that degraded lakes have numerous psycho-social, economic, and ecological impacts on people who have based their lives on the lake in one or another way. Poverty and underdevelopment in Ethiopia underlie the anthropogenic forces that degrade lakes (Graichen, 2011). Psycho-social impacts related to the eco-systemic changes around the lake were measured using seven items with a 5-point rating scale. Respondent were asked to rate their personal inclination with each question using

Table 2. Respondents perceived behavioral control regarding reversibility the lake's status.

Perceived behavioral control	Responses	Frequency	Percentage
In your opinion, can such eco-systemic change around the lake be controlled?	Yes	240	80
	No	60	20
	Total	300	100
I personally feel that I can make a difference with regard to reversing the problems on lake Ziway	Yes	100	33.3
	No	200	67.7
	Total	300	100

Table 3. Respondents perception of vulnerability.

Vulnerability	Frequency	Percentage	
In your opinion, who is more vulnerable because of the problems in lake Ziway/Dembel?	Anybody in the town	240	80.0
	only those around the lake such as local fishers, farmers	50	16.7
	Horticulture investment owners	10	3.3
	Total	300	100.0

**Figure 1.** Respondent's level of agreement on whether or not informal recreational activities on the lake has been diminishing or not.

“strongly agree”, “agree”, “disagree”, “strongly disagree” and “don't know”. According to the data, almost 74% of the participants reported the diminishing of informal recreational activities on the lake than ever before. As depicted on the Figure 1, still another majority, 13% responded with a strong agreement on the item. Small

proportion of participants 3.3 % expressed their disagreement with the item that was concerned on evaluating whether informal recreational activities on the lake is declining than it was before. This finding is consistent with past studies on the area, as stated by Malefia (2009) lake Ziway has long been used as source

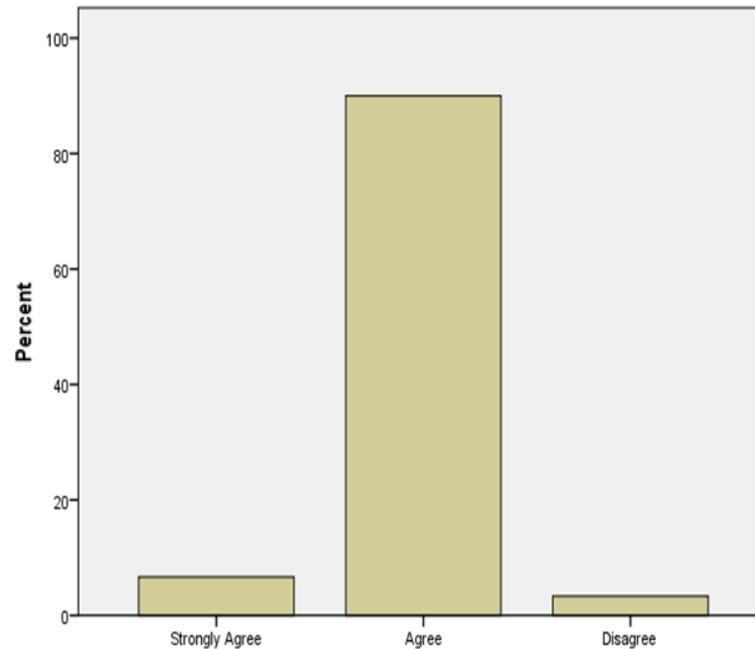


Figure 2. Respondents level of agreement on whether or not people in the local community are anxious because of the gradual decline of the lake.

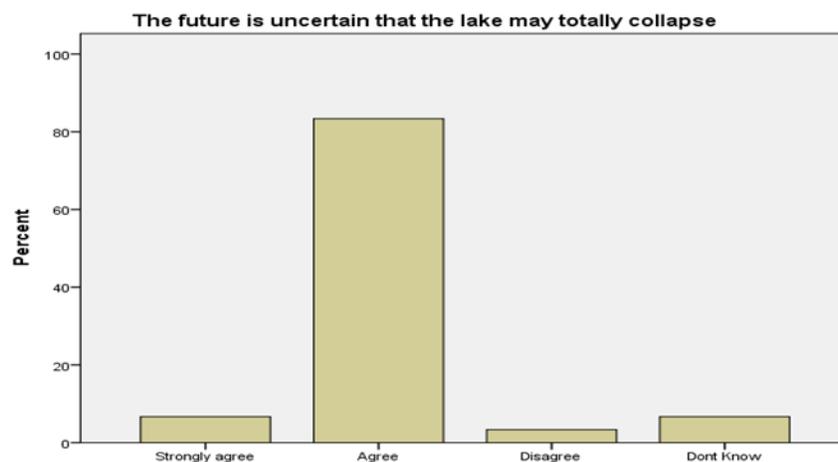


Figure 3. Respondents opinion on the future status of the lake.

of recreational activities such as bathing, fishery and eco-tourism. However, there is a lot of deliberation about floriculture industries located at the shore discharging untreated effluent directly in to the lake; as a result excessive fertilizer and pesticide residue from the farm is deteriorating the water quality as well as the aquatic life.

When respondents asked about whether or not they are anxious because of the gradual deterioration of the lake status, a high percentage (90%) of them expressed their agreement, while another 6.7% of them rated the item with “a strong agreement”. Only one respondents in

this base line study reported their “disagreement” stance (Figure 2).

Respondents were also asked to give their opinion on what will be the status of the lake in future. A high percentage of respondents (83.3%) stated their agreement that they are uncertain on the futurity of the lake and feel it may gradually collapse. Also, 6.7% of them expressed their strong agreement on the item. However, (6.7%) of respondents does not seem pessimistic about the future status of the lake (Figure 3).

The other item on this category aimed at assessing

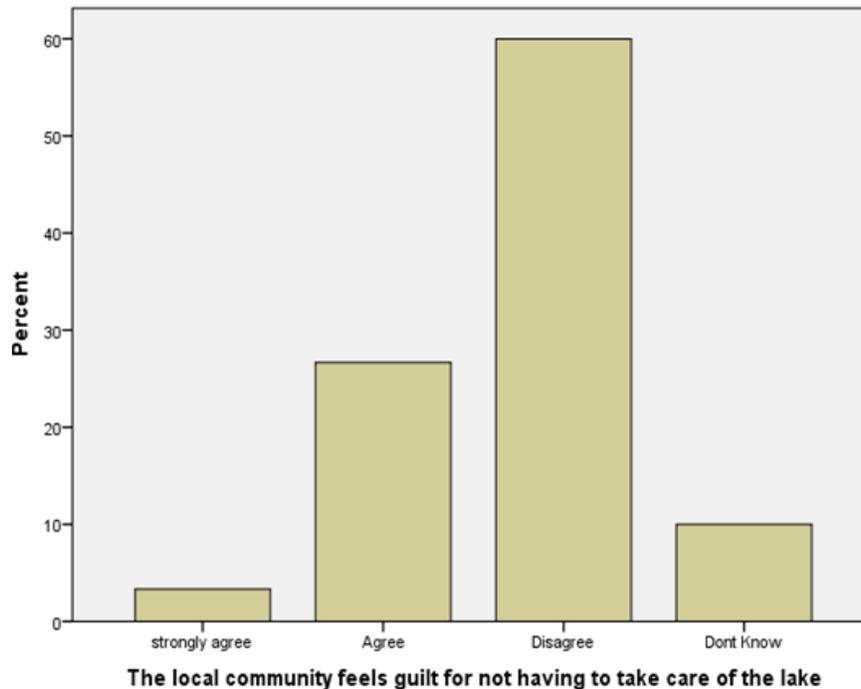


Figure 4. Respondents' opinion on whether or not the local community feels guilty for causing damage on the lake.

local people sense of guilt for not having care for the lake. The highest percentage (60%) of them expressed their "disagreement" while another majority, (26.7%) of them expressed their "agreement" and "strong agreement" stance on the item. However, 10% of them said they "do not know" whether the local people is feeling guilty or not for not having to care of the lake (Figure 4).

As stated by Reuveny (2008), diminishing resources set the stage for inter-group conflict, either when two groups directly compete for the remaining natural resources, or when ecological degradation forces one group to migrate out of its own territory and become an immigrant into another group's territory. This small base line snap short also found that there are some conflicts emerging due to increased demand on the lake. Among our participants, 17 and 13% of them said "strongly agree" and "agree" respectively on the item which inquires whether or not conflicts are emerging due to increased demands on the lake. However, another majority 57% of the respondents said to have no information on the issue. Lastly, only one respondent mentioned their disagreement on the item.

Similarly, people were also asked to expressed to rate their opinion on the level and degree of inter community conflicts perpetrated by increased pressure on the scarce resources of the lake .accordingly, 20 and 16.7% of them said "strongly agree, and " agree" on the item. Of the respondents, majority 60% of them expressed that they don't have information in this regard. Only 3% of

them stated their disagreement on the rise of inter-community conflicts on scarce resources on the lake (Figure 5).

Lastly, respondents were also asked to give their opinion on whether or not local people sense of ownership is declining or not due to the expansion of investment on the lake (Figure 6). Accordingly, a high percentage (73.3 and 13.3%) of them said, "agree "and "strongly agree" respectively. However, 10% of the respondents stated their disagreement.

Impact on local livelihoods

To assess the impact of deteriorating lake on local livelihoods such as informal fishing and transportation, the above question have been asked both in the form of an item in a survey questionnaire and in a focus group discussion. As the survey response shows in the table above, majority of the respondents (76.7%, 230 in number) have chosen "agree" asserting that local livelihoods are being negatively affected as a result of environmental problems associated with the Lake (Table 4).

In addition to the above information presented in the form of table, FGD data indicates that there are some adverse effects of eco-systemic changes in Lake Ziway on the fishing activities in *Giressa* village, near *Meki* town in *Dugda* woreda. Following is narration of ideas

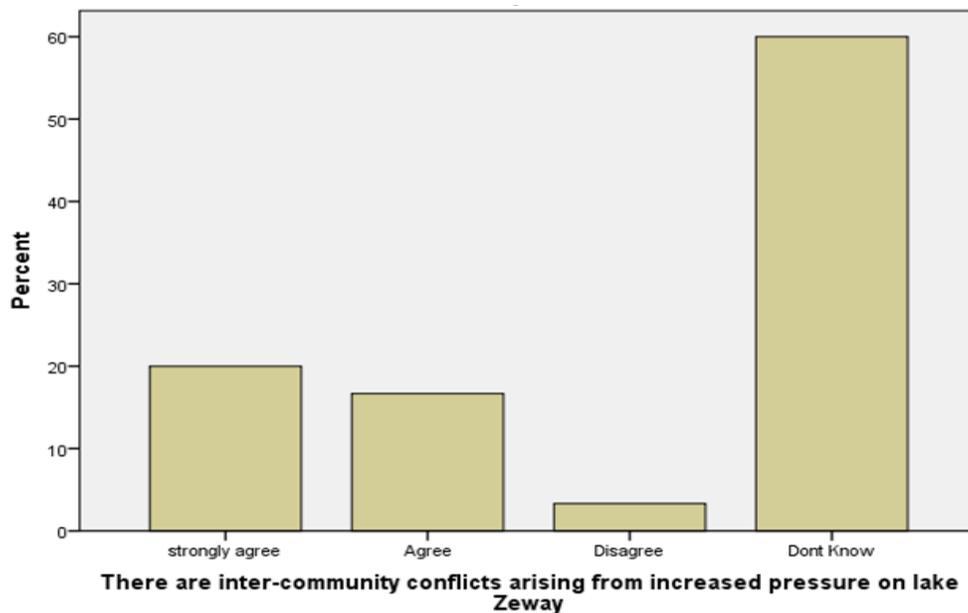


Figure 5. Respondents response on inter-community conflicts.

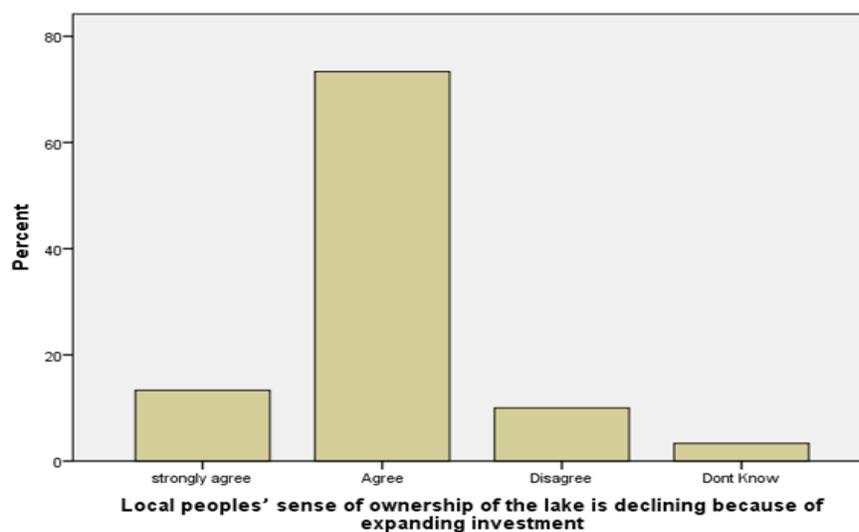


Figure 6. Respondents' answer on their own sense of ownership level because of expanding investment on and around the lake

Table 4. Impact on Local Livelihoods.

Impact on local livelihoods	Responses	Frequency	Percentage
Livelihood activities such as informal fishery and transportation are being affected because the shrinking of the lake and organized investment	Strongly agree	30	10.0
	Agree	230	76.7
	Disagree	30	10.0
	Strongly disagree	--	---
	Do not know	10	3.3
	Total	300	100.0

Table 5. Mitigation efforts and community participation in the conservation and preservation of the lake.

Mitigation efforts and community participation	Responses	Frequency	Percentage
Are there efforts you made to contribute to mitigating the problems happening to Ziway Lake	Yes	120	40.0
	No	180	60.0
	Total	300	100
Are there mechanisms undertaken to make the 'local community' involve in natural resource conservation and preservation?	Yes	110	36.7
	No	190	63.3
	Total	300	100
Was there due consideration of local community's needs and priorities in the establishment process of investment such as flower farm, recreational facilities and so on?	Yes	100	33.3
	No	200	66.7
	Total	300	100

forwarded by one of the FDG participants in the same village; the speech was made in Amharic and it is directly translated English.

I think that the volume of water in Meki river starts declining since the 1960's E.C. However, it is since 2007. that the river's water volume is declining highly to the level of absence especially, during December to May. This problem is partly caused by some irrigational activities that were dependent on the river near Butajira town.

Another participant in the same Focus Group highlights the current situation of local fishing compared to the past times as in his speech presented as follows.

Currently it is becoming very difficult to obtain a good amount of fish within a single catch attempt. Before years, it was simple to collect up to 2000 fishes in a single trial, however, these days it is even becoming difficult to grab 100 fishes in a single catch. Therefore, the fish quantity in the lake is diminishing than ever before, and this adversely affects us since our livelihood is considerably supported by fishery.

Mitigation efforts and community participation in resource conservation, preservation and sustainable utilization

This study, assess some interrelated issues such as mitigation efforts, participation of local community in sustainable use of the Ziway Lake through both survey of purposively selected 300 respondents from different sectors and Focus Group Discussions (Table 5).

In one of the question items, respondents were asked whether different stake holders have made efforts to contribute to the conservation of Lake Ziway. 12 respondents (40%) responded "Yes" while 60% of them responded "No". This data makes it difficult to conclude that there are no efforts since a considerable percentage

of the respondents admitted through their responses that there are efforts made by different bodies to contribute to mitigating the problems happening to Ziway Lake. This claim can best be triangulated by focus group qualitative data by the based a speech by one of FGD participants narrated as follows.

There are some efforts made by the local government of Batu town in order to contribute to solving lake pollution. This effort comprises "Share Ethiopia" and "Horn of Africa", which involves such activities as solid waste management and/ or avoidance solid waste material from the lake surrounding. Besides, trainings were given to dwellers of Batu town on mechanisms of managing solid waste material with the aim of creating awareness on the danger of lake pollution by waste materials produced by hotels, residents and so forth. However, these efforts did not meet the desired goal for they were not sufficient mechanisms and there is a gap in strict supervision of different bodies such as floriculture industries, other business organizations and residents.

There is limited achievement made so far in mitigating the problems associated with the Lake despite the involvement of different governmental and non-governmental organizations and the local community. The baseline information shows that there is urgency for highly coordinated multi-sectoral involvement and integration. Out of the survey respondents who were asked whether there are some mechanisms of engaging the local community (residents of Batu town and people living in the surrounding area) in resource conservation and preservation especially Lake Ziway, (36.7%) responded "yes" and the remaining (63.3%) answered "no". The considerable numbers of respondents who have replied "no", to the question oblige us to reconsider the issue and we (researchers) have tried to supplement this data with some FGDs. Following is a narration.

There are some mechanisms by which people can contribute to reduce Lake Water pollution, of which one is

waste material management. Business organizations are responsible to clean manage waste materials up to 50 meters radius, while individual households are responsible to do so up to 20 meters radius. However, there is a huge gap in practice.

Another FGD participant also raised the following:

We have participated to eliminate the newly emerged and invasive weed. Other than this, we did not have made such a strong effort to preserve or conserve this lake. There are no awareness creation and training endeavors made by local government offices.

Regarding the question raised concerning due consideration of local community's needs and priorities in the establishment process of investment such as flower farm, recreational facilities and so on, (66.7 %) majority of the respondents answered "no", while the remaining 33.3% replied "yes". This data once again calls for further investigation and due consideration. From focus group discussions, it was possible to understand that there are some gaps between the local community and owners of investment. Actually, in most cases, local interests and priorities do not coincide with global or national ones. Here, it is good to present a speech made by a focus group discussant.

There is poor awareness and consideration for the Lake on behalf of investment companies. They pollute the lake by their chemical residue. Most of us think that the lake is already poisoned, therefore pregnant women are not recommend using the lake water. There is a gossip that these companies use pesticides and insecticides that are not allowed by the government. In fact there are some works being made by these investment companies to an attempt to contribute to reducing adverse impacts on the lake. One example for this is, water recycling. For these and other reasons, even some people in Batu area do not prefer to be hired in the companies.

From focus group discussions, it was possible to understand that there are some gaps between the local community and owners of investment. Actually, in most cases, local interests and priorities do not coincide with global or national ones. However, some efforts have to be done to create integration of local and national interest even if one may argue that national agendas incorporate local ones. In cases where local communities don't have strong sense of belongingness for natural resources, investment activities or any other project, it is very difficult to realize sustainability. There for, a more pro-environmental behavior and attitude is expected from companies that are utilizing the water in Lake Ziway.

Conclusion

Generally, people as well as other stakeholders were

found to be familiar with most of the eco-systemic changes around the lake. However, the understanding of these changes, its causes and perceived sense of behavioral control in improving the situation varied widely among them. This was evident when FGD participants as well as key informants in Meki town blamed ('absence of rainfall, 'Nature' or 'God') indicating lack of proper understanding among the people from all spheres of society. Moreover, majority of the respondents in the survey also seem to be in doubt and skeptic about their individual contribution and the possibility of bringing any change on the lake and solving its problem. Irrespective of the level of understanding of biodiversity change around the lake, the current snapshot study found a high level of awareness about the current vulnerable status of the lake; huge decrements and irregularity of water quantity, fish diversity, catchment decrease, perceived presence of chemical hazards and pollutants in the lake which they describe them as a threat for health. During the FGDs, participants also talked about human and industrial ('flower farming') activities near Ziway town as responsible for the frequent deterioration of the lake status and the overall environmental and water pollution on the lake. A large majority of the respondents also feel that there will be a collateral damage for all member of the population if situations on the lake persist in this way. Common threats to scarce water and natural resources may bring common and interrelated psycho-social and economic impacts that may be cyclical and complex in nature. This baseline study also illustrated the psycho-social and economic impact of the degraded current status of the lake. It has been noted that lake Ziway has long been used as source of recreational activities such as bathing, fishery and eco-tourism. However, as the analysis in this report showed, there exist diminishing of informal recreational activities on the lake than ever before. Such adverse changes in the lake status on many dimensions also make the local communities anxious and totally worried to the extent that they feel that it may gradually collapse. Respondents in the current baseline study also revealed that local people sense of ownership is declining due to the huge expansion of investments and irrigation activities on the lake and its adverse impacts. Although it is minimal, this small base line snapshot also found that there are some conflicts emerging due to increased demand on the lake. In addition to the above psycho-social impacts, as the lake has been the source of agricultural, fisher and drinking water, the many changes occurring in the water volume of the lake affected the local people livelihood. This base line report provide indicative information on current changes on the fishing activities of local fishers, as both local residents and government officials asserted, fish production in the lake was greatly decreased which in turn adversely affect local peoples economic livelihood. Despite some mitigation efforts made by local government and other stakeholders such as Share Ethiopia, Horn Africa and the

local community, the analysis indicated there is limited achievement. The local people also described their participation on occasional conservation activities on the lake by taking part on removing the recent weed invasion on the lake and waste management. The baseline study has also indicated that local people feel that the existing investment expansion around the lake is a threat to the sustainable use of the resources as these companies use chemicals that are considered to be hazardous in nature. Lastly, the study also depicted the absence of participatory, multi-sectoral and integrated planning, intervention in natural resource conservation, preservation and sustainable utilization.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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