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The Right to Clean and Healthy Environment: The Case of Lake Ziway Area

By
Afewerk G/Hiwot

15 January, 2019

Addis Ababa

ADDIS ABABA UNIVERSITY, SCHOOL OF LAW AND GOVERNANCE

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By

Afework G/Hiwot

**A thesis submitted to the Law Faculty of Addis Ababa University in the post
graduate program in partial fulfilment of the Requirements of the
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Advisor: Elias Nour (PhD), Associate Professor

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Addis Ababa

Declaration

I, Afework G/Hiwot Tesfaye, hereby declare that this dissertation is original and has never been presented in any other institution. I also declare that secondary information used have been duly acknowledged.

Student: Afework G/Hiwot Tesfaye

Signature: _____ Date _____

Endorsement

This thesis has been submitted for examination with my approval as supervisor.

Elias Nour (PhD), Associate Professor

Signature: _____

Date: _____

Acknowledgement

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Approval Sheet

**ADDIS ABABA UNIVERSITY
COLLEGE OF LAW AND GOVERNANCE STUDIES
SCHOOL OF LAW
HUMAN RIGHTS LAW (LL.M PROGRAM)**

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BY: AFEWORK G/HIWOT

January, 2019

Approved by the Board of Examiners:

Advisor: Elias Nour (PhD)

Signature and date

Examiners

Signature and date

Signature and date

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Abstract

Lake Ziway is one of the largest fresh water resources in the Rift Valley Region. Currently the lake is exposed to various human pressures due to intensification of large scale and small scale farming activities around the watershed. The lake's water quality is affected by the untreated agro-chemical effluents discharged into the lake by the floriculture industries located at the shore of the lake. Moreover, agro-chemicals enter into the lake from the small scale irrigation practices via run off. Effluents from the flower farms and pesticides from horticulture activities at the shore of the lake can migrate via water into the food chain as well, ultimately being consumed by humans/ animals in food. These chemicals have negative impact on humans, animals and fish resources. Exposure to these chemicals through different modes could cause cancer, neurological disorder, and birth defect such as missing body parts on humans. Moreover, these chemicals kill fish resources. The excessive water abstraction for the large scale and small scale irrigation activities, siltation due to soil erosion that brings in silt soil to the lake as a result of farming in adjacent lands..., are also affecting the water quantity of the lake. And there is an estimate that the lake could encounter the fate of Lake Haromaya unless the limited water resource is used in a sustainable manner. The researcher has employed socio-legal research which is qualitative and descriptive by examining the relevant laws and assessing their application by field research. The literature review includes document review and the empirical part of the research includes interviews and discussion with relevant office holders, focus group discussion, and survey questionnaires. Various findings have emerged from the study. Firstly, chemical effluents, siltation and reduced water level have adversely affected the fish resources of the lake, and the reduction in the water level of the lake has caused substantial decline in vegetation around the lake which serve as breeding and nursery grounds for fish. Moreover, juvenile and adult fish are dying because of chemical effluents that enter into the lake in various ways. Moreover, fish resources of the lake is depleting as the result of over exploitation. Hence, the environmental problems and other factors are affecting the right to livelihood, the right to life, food, health and other rights of the fishermen and the local community. Secondly, in spite of Ethiopia's commitments under major human rights instruments and various domestic environmental laws the findings of the study indicate the absence of regulations, absence of agro-chemical policy, lack of political will, and gaps in regulatory and enforcement capacity.

Chapter One

Introduction

1.1 Background of the Research

Ethiopia is one of the oldest nations in the world. Though the country is endowed with various natural resources, the country's economy is mainly dependent on agriculture. Ethiopia has millions of hectares of fertile land¹ and huge quantity of fresh surface and ground water resources.² Despite the country's huge potential for agriculture, there are still a significant number of people affected by recurrent famine or starvation.

Ethiopia's ecological system is also highly fragile and vulnerable to climate change.³ When this problem is combined with the current high population growth rate, it creates pressure on the country's land and water resources. Soil degradation, deforestation and loss of biodiversity could be raised as challenges.⁴ And all these factors have direct implication on sustainable and enhanced livelihood.⁵

In order to fulfill the right to development of the Ethiopian people as provided under Article 43 of the Constitution and achieve its ultimate aim of enhancing the capacity of citizens for development, the government is spending massive amount of money and other resources besides adopting various policies and strategies⁶.

In order for the country's current fast economic growth to continue and achieve development, as clearly stipulated under the Rio Declaration on Environment and Development, the effort to

¹ Belay Getachew, Critical Analysis of The Applicability of the Right to Development in Ethiopian Context (2009), (L.L.M. Thesis, Addis Ababa University School of Law Graduate Studies, Public International Law Program (June 2009, Addis Ababa) p. 60

² Federal Democratic Republic of Ethiopia, Country Strategic Paper 2011-2015, April 2011 Africa Development Bank Group p.10.

³ Id, p.8.

⁴ Ibid

⁵ Ibid

⁶ Proclamation of the Constitution of the Federal Democratic Republic of Ethiopia, 1995, Proc. No. 1, Neg. Gaz. Year 1, no. 1. See Art. 43(4)

bring development must meet developmental and environmental needs of the present and future generations.⁷

The human person is the central subject and beneficiary of the right to development.⁸ However, mankind cannot achieve sustainable development unless environmental protection constitutes an integral part of the development process and sustainable development cannot be considered in isolation from environmental protection.⁹ Hence, utilization of natural resources should be in a sustainable manner and development activities of the country should take the environmental concerns into account. Moreover, the attempt to fulfill certain human right should also consider the adverse impact it could have on the rights of others. Otherwise, the very objective of development, i.e., raising the livelihood and life standard of all individuals, cannot be achieved. In general, ensuring a clean and healthy environment plays a pivotal role in achieving sustainable development, thereby enhancing the life standard and livelihood of individuals.

In the past, the right to clean and healthy environment was considered as mere moral and political aspiration.¹⁰ However, currently it has legal recognition.¹¹ It is also considered as *a sine qua non* to the enjoyment of all other human rights including the right to life, which is the fulcrum of all other human rights.

With respect to revolutionizing the right to environment, the Stockholm Conference has played a pivotal role, especially in equating the right to a healthy environment to the right to life. After the Stockholm Conference, a number of other international conferences have also declared the right to a healthy environment to be human right.¹² A number of international treaties adopted under the auspices of the UN give recognition to the right to a clean and healthy environment. Besides, various regional human rights systems such as the European Human Rights System, the Inter-American Human Rights system and the African Human Rights system give due recognition to the right to healthy environment.

⁷United Nations Conference on Environment and Development (UNCED), held at Rio de Janeiro from 3rd - 14th June 1992. Rio Declaration, principle 3.

⁸Belay Getachew, Supra note 1, p.2.

⁹Rio Declaration, Supra note 7, principle 4.

¹⁰See BekeleTekle (1995), The Right to A Healthy Environment: International and National Law Perspectives (L.L.M Thesis, University of Nairobi, Faculty of Law (April 1995, Nairobi), p.3.

¹¹ Id, p.5.

¹² Id, p.6.

Ethiopia is one of the founding members of the UN and OAU/AU. As a member, it has participated in a number of deliberations, declarations, decisions or resolutions. Furthermore, it has pledged itself to promote and enforce human rights in various times both at the UN and AU level. Article 9(4) of the FDRE Constitution provides that international agreements ratified by Ethiopia form an integral part of the law of the land, and Article 13 enshrines the responsibility of all branches of Government to respect and ensure respect for the fundamental rights and freedoms.¹³ These international and regional human rights instruments to which Ethiopia is a party guarantee the rights to clean and healthy environment.¹⁴

Ethiopia is also one of the countries that gave constitutional recognition to the right to clean and healthy environment.¹⁵ For instance, the Constitution under Art. 44(1) provides that “All persons have the right to a clean and healthy environment.”¹⁶ In addition to giving recognition to environmental rights, the Constitution under Art. 92(1) clearly provides that the “Government shall endeavor to ensure that all Ethiopians live in a clean and healthy environment.”¹⁷ The government of Ethiopia has also adopted various laws and regulations that aim at protecting the environment. It has also adopted an environmental policy which its overall goal is to improve and enhance the health and quality of life of all Ethiopians and to promote sustainable socio-economic development through sound management of natural resources and the environment.¹⁸

¹³ FDRE Constitution, Supra note 6, See Art. 9(4) and Art.13(1)

¹⁴ When it comes to the right of clean and health environment under international law, it could be seen from two perspectives since environmental right is not expressly provided under international law. Firstly, we could extend the interpretation of the right to life to incorporate the right to clean and healthy environment. For instance, Art. 6 of ICCPR , Art. 3 of UDHR. Moreover, incidental references could also be made. For example, under the UN CHARTER, Art. 1(3) could be important since it calls for international cooperation among states on solving problems of an economic, social and economic nature. However, compared to international law, regional laws give fare-well protection to the right of clean and healthy environment. See for instance, Art. 16(1) of the African Charter reads: Every individual shall have the right to enjoy the best attainable state of physical and mental health. (2) States parties to the present Charter shall take the necessary measures to protect the health of their people and to ensure that they receive medical attention when they are sick. See also Article 24 of the African Charter reads: ‘All peoples shall have the right to a general satisfactory environment favorable to their development.’ For more information on the recognition of environmental right as human right See Malcolm N.Shaw, International Law (6thed., 2003) pp.844-898.

¹⁵ Ministry of Foreign Affairs, (APRIL 2014), Ethiopian government Fifth and Sixth Periodic Country Report (2009-2013) on the Implementation of the African Charter on Human and Peoples’ Rights in Ethiopia to the African Commission on Human and Peoples’ Rights under Art. 62 of the ACHPR p.122.

¹⁶ FDRE Constitution, Supra note 6, See Art. 44

¹⁷ Id, Art. 92(1)

¹⁸ You could see the following Policy and Laws concerning environmental protection in Ethiopia-The Environmental Policy of Ethiopia, April 1997, Environmental Pollution Control Proclamation, Procl. No. 300/2002, Neg. Gaz., 9th Year, No.2, Environmental Impact Assessment Proclamation, Procl.No299/2002, Neg.

Institutional and administrative measures are also being taken by the government to ensure people's rights to clean and healthy environment. However, taking legislative, administrative and institutional measures by itself cannot bring the desired outcome unless tangible practical steps are taken to ensure the enjoyment of the right to clean and healthy environment. As clearly stipulated by the African Commission on Human and Peoples' Rights, in the matter between *Social and Economic Rights Action Centre (SERAC) and Another v Nigeria*,¹⁹ governments must comply with all the four levels of obligations (obligation to respect, protect, promote and fulfill the rights) that all human rights instruments generate.

As a result of various incentives for investment, there are a number of small scale and large scale floriculture and horticulture activities around the shore of Lake Ziway. The horticulture and floriculture activities, both large scale and small scale, carried out at the shore of Lake Ziway provide employment opportunities to the local population, which are mainly dependent on subsistent agriculture.²⁰ Moreover, the large scale floriculture industries serve as a source of foreign exchange to Ethiopia.

Lake Ziway also provides food, income and employment to a number of peoples. Unlike crop production, fishing provides year round production and income. Fishing provides a form of social security for vulnerable households when the agriculture based rural economy is stressed due to irregular rainfall for factors beyond national control.²¹

While these development activities are creating job opportunities around the area, they are also creating huge environmental concern around the Lake. Though Lake Ziway is widely being used for various uses (such as large scale and small scale irrigation, animal watering, bathing, domestic water use, fishery and eco-tourism), its resources have been misused causing resource

Gaz., 9th Year, No 11, Environmental Protection Organs Establishment Proclamation, Procl.No. 295/2002, Neg. Gaz., 9th Year, No.7.

¹⁹Decision of the African Commission on Human and Peoples' Rights, *Social and Economic Rights Action Centre (SERAC) and Another v Nigeria*(2001) AHRLR 60 (ACHPR 2001) para. 44.

²⁰Malefia Tadele, Environmental Impacts of Floriculture Industries on Lake Ziway: With Particular Reference to Water Quality (2009) (M.Sc Thesis, Addis Ababa University School of Graduate Studies, Environmental Science Program (June 2009, Addis Ababa), p.3

²¹ Petra Spliethoff, et.al., "Past, Current and Potential Production of Fish in lake Ziway" (2009), Capacity Development and Institutional Change Programme Wageningen International, the Netherlands, 20 January 2009, available at: <http://edepot.wur.nl/247875>, (Accessed on Feb 18, 2018), p.14

degradation and ecosystem disturbance because of the number of floriculture and horticulture industries being carried out around the shore of the lake.²²

1.2. Location and Description of the Study Area

Lake Ziway is located at $7^{\circ} 52'$ to $8^{\circ} 8'$ N and $38^{\circ} 40'$ to $38^{\circ} 56'$ E at an altitude of 1636 m a.s.l. in the Ethiopian Rift Valley. It is found around 160 km South of Addis Ababa on the Addis Ababa-Awassa road. It is the fourth largest lake in Ethiopia with an open area of 432 km², and 137km shoreline length. It is the shallowest lake in Ethiopia.²³ Its maximum depth is 9m and its average depth is 2.5 m. The volume of the lake is approximately 1.1 billion m³.²⁴

The Lake has two tributary rivers. It is fed by Meki River from North West and Ketar River from East. The lake has an outflow to Bulbula River which in turn flows to Lake Abiyata.²⁵ Lake Ziway has 5 main islands-Tullu Guddo (4.8km²), Tsedecha (2.1km²), Debresina (0.3km²), Funduro (0.4km²) and Gelila (0.2km²).²⁶

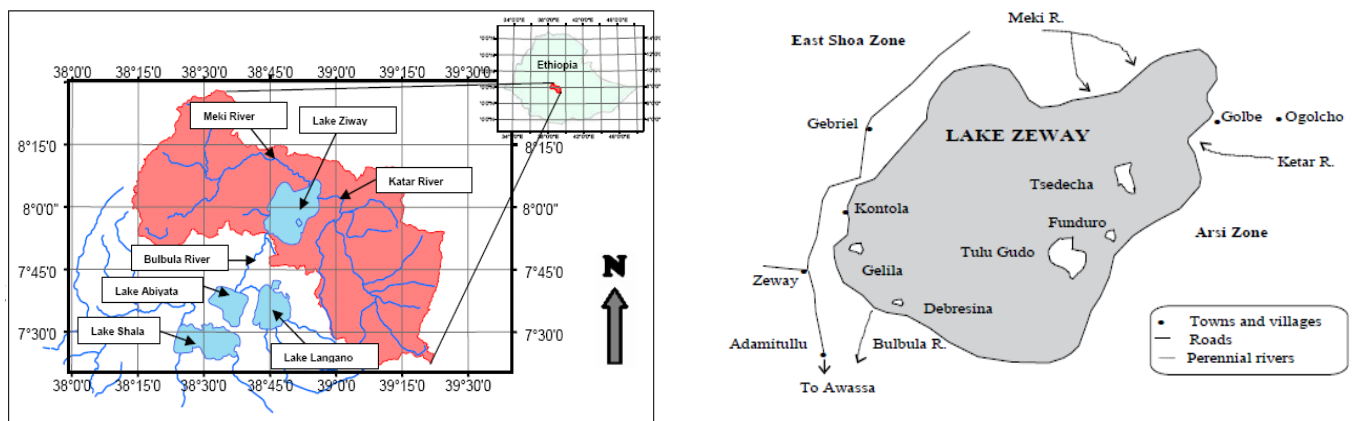


Figure 1 The above two pictures show the Geographical location of Lake Ziway and the Islands found in the Lake

²²Malefia Tadele, supra note 20, p.1.

²³Endebu M, Lema A, Genet T, Mitike A, Regassa B, et al. “Fisheries Baseline Survey Describing Status of Fisheries in Lake Zeway”, *Ethiopia. J Fisheries Livest* Volume 3 (2015), p.1.

²⁴Hengsdijk, H. and Jansen, H. 2006a. “Agricultural Development in the Central Ethiopian Rift Valley”. A desk-Study on Water related issues and Knowledge to support a policy dialogue. Plant Research International, Note 375(a), p.13

²⁵Endebu M., et.al, Supra note 23, p.1

²⁶Ibid

1.3. Statement of the Problem

The long shoreline of Lake Ziway is covered with submerged vegetation and especially in the south, papyrus and emergent grasses, reeds and scymora trees. This vegetation around the shore of the Lake serves as breeding and nursing places for fish. However, due to the reduction in the water level of the Lake some of these breeding and nursery places are drying up and this has direct impact on the fish resources and reproduction and those whose livelihood is dependent on fishing ultimately affecting their right to life.²⁷

Over the past decade, fish productivity has declined dramatically affecting the livelihood of the local fishermen who entirely rely on fishing. The reduction in fish production is attributed to a number of factors.

Firstly, the large scale and small scale irrigation activities located at the shore of Lake Ziway have been putting up pressure on the water quality of the lake. These small scale and large scale irrigation activities use various types of agro-chemicals. For instance, some of the flower farms at the shore use around 200 different types of agro-chemicals. The small scale irrigation activities also use even banned chemicals, such as indosulfan and DDT²⁸, which are famously known for killing fish and bees.

²⁷ Petra Spliethoff, et.al., supra note, p.21, concerning the relationship between the right to livelihood and the right to life, there are a number of notable cases where deprivation of one's means of livelihood is considered as deprivation of the right to life. For instance, in Tan's Case, *Delhi Transport Corp v DTC Mazdoor Congress & Ors*, *Olga Tellis v Bombay Municipal Corp*. Most importantly in *Olga Tellis v Bombay Municipal Corp* case which was entertained by Indian Supreme Court, Judge Chandrachud CJ said that: "The sweep of the right to life conferred by art 21 is wide and far-reaching. It does not mean merely that life cannot be extinguished or taken away as, for example by the imposition and execution of the death sentence, except according to procedure established by law. That is but one aspect of the right to life. *An equally important facet of that right is the right to livelihood because; no person can live without the means of living, that is, the means of livelihood. If the right to livelihood is not treated as a part of the constitutional right to life, the easiest way of depriving a person of his right to life would be to deprive him of his means of livelihood to the point of abrogation.*"For more information on the above issue you could See Vanitha Sundra Karean, Constitutional Protection of the Right to Livelihood in Malaysia: Reality or Mere Fallacy, 11 *Asia Pac. L. Rev.* 23 (2003)

²⁸ Sintayehu Fikadu, Agronomist at Castel Winery, Ziway, Ethiopia, interview held on 20/12/2018, in his office at 2:00 pm.

The flower farms at the shore discharge effluents that contain chemicals directly into the lake²⁹. Some of the flower farms at the shore are MPS³⁰ certified; these farms have been applying waste management techniques to reduce environmental impact. However, most of the flower farms are not taking measures to reduce the impact of chemical effluents on the environment. Therefore, they discharge chemicals directly into the lake³¹.

Agro-chemicals that enter into the lake from small scale irrigation activities via-run off and chemical effluents discharged into the lake from the flower farms, affect the aquatic organisms. These agro-chemicals affect the food resources of the fish. Moreover, they also kill the fry fishes. Especially around the effluent outlet of the flower farms, recurrent occurrence of fish mortality is observed.

Agro-chemicals could also cause huge health concerns both for animals and humans. Effluents from the flower farms and pesticides from horticulture activities at the shore of the lake can migrate via water into the food chain as well, ultimately being consumed by humans/ animals in food. Agro-Chemicals such as, indosulfan and DDT can cause cancer, neurological problems, birth defects ...on human beings.

For instance, the concentration of DDTs in Lake Ziway edible fish was investigated. The estimated daily intake (EDIs) of Organochlorine pesticides (OCPs) from all fish species were much lower than the acceptable daily intakes (ADIs), indicating that consumption of fish is at little risk to human health at present.³² However, the cancer risk estimates in Lake Ziway and hazard ratios of DDTs and certain other chemicals was found beyond the threshold value, indicating that daily exposure to these consumptions is a potential concern. This may result in a life time cancer risk of a greater than 1 in 10.³³ In this regard fishermen of Lake Ziway are the first victim as they are daily consumer of fish. Moreover, even if the consumption of water,

²⁹ Sintayehu Fikadu, Agronomist at Castel Winery, Ziway, Ethiopia, interview held on 20/12/2018, in his office at 2:00 pm.

³⁰ MPS refers to Millieu Program Sierteel or Horticultural Environmental Program. It is standard and works as a benchmark in demonstrating to what extent horticulture operations are environmentally friendly

³¹ Malefia Tadele, supra note 20, p.3

³² Yared Beyene, Levels and Effects of Organochlorine Pesticides and Heavy Metals in Aquatic Ecosystem From The Rift Valley Region, Ethiopia (2014), (Msc. Thesis Hokkaido University Department of Environmental Veterinary Sciences, Graduate School of Veterinary Medicine, (2014 Japan)), p. 51

³³ Ibid

vegetables, animal meat and levels of other pollutants is not considered in Yared's research, he estimates that the actual health risk for local people through dietary intake could be higher³⁴.

Moreover, Lake Ziway used to serve as the only drinking water supply for the town's residents. However, currently drinking water supply of Ziway town comes from a place known as Sedeseden, 50 km away from Ziway town. The decision to bring drinking water supply from Sedeseden was made because Lake Ziway was polluted by Chemicals and the ph level of the water was unsuitable for consumption³⁵.

Secondly, over the past decade, a number of youngsters and rich merchants have engaged in irrigation activities at the shore of the lake creating pressure on the water quantity of the lake. These irrigation activities abstract huge amount of water from the lake even during the rainy season³⁶. Moreover, there are also irrigation activities in the upstream areas of Meki and Ketar rivers, which are tributaries of Lake Ziway. These agricultural practices in the upstream areas have substantially reduced inflow water into Lake Ziway thereby affecting its water level. The problem even becomes worse when coupled with the millions of cubic meters of water lost through evaporation.

The reduction in water level results in less catch of fish. Abundant fish species are collected when the water level of the lake is high. Reduction in water level of the lake because of intense abstraction of water could have negative impact on the fish population by drying up their breeding and nursery grounds.

Reduction in the water level of the lake also could turn the lake into terminal lake and this eventually turns the lake into saline. If the lake becomes saline, it will have major impact on the lives of the local communities who depend on the lake for various purposes such as domestic water supply, irrigation, and livestock watering.

Thirdly, siltation is also affecting Lake Ziway. More than 90% of the vegetation around the shore has been destroyed and the land is exposed to soil erosion. Every year much amount of dust

³⁴ Id, p.67

³⁵ Tahir Hedeto, Oromia National Regional State Batu Town Environmental Protection, Forestry and Climate Change Authority, interview held on 26/11/2018, in his office at 4:30 p.m

³⁶ H. Desta et.al, "Farmers' Awareness and Perception of Lake Ziway(Ethiopia) and its Watershed Management" , Elsevier Journal GmbH, Limnologica Vol. 65(2017), pp.61-75.

enters into the lake. Siltation affects the water level of the lake. It also dried up the vegetation around the lake which serves as breeding and nursery grounds for fish.

Recently also hyacinth is becoming another problem in Lake Ziway. Currently there is an estimate that around 22 hectares of the lake is covered by hyacinth. Hyacinth also affects the fish resources by reducing the dissolved oxygen in the lake.

Chemical effluents, excessive water abstraction for irrigation practices (both in the upstream areas and around the shore of Lake Ziway), siltation, hyacinth... all have their own effect on the ecology of Lake Ziway and the economy of its fishery and the health and life of animals and human beings.

Generally, though the community has the right to clean and healthy environment and developmental activities should be carried out respecting such right, it is grossly infringed. And change in the water quality of Lake Ziway because of chemicals, siltation, reduction in the water level...have their own effect on fish production. This in turn ultimately affects the right to livelihood and many other human rights of the fishermen. Hence, to evaluate how the environmental problems around the shore of Lake Ziway are affecting the right to livelihood and various other human rights of the fishermen and to solve such problem an in-depth research is needed to be conducted.



Figure 2 This picture was taken in February 2018. A Decade ago all the vegetation was filled with water. But now especially during the dry season the vegetation dry up and peoples cut the *bofefe trees* for fire wood.



Figure 3 Picture 1 and 2 were taken from a place commonly known as korekonch haik (around Haile Resort Entrance) during the rainy season the area used to be filled with water. However, this has never happened for a while.



Figure 4 This picture was taken from a commonly known place cafeteria in February 2018. This area also used to be full of water. However, currently it is drying up and sometimes around May, the lake becomes too dry the locals use the place for motor bike training

1.4.Objectives of the Research

The general objective of this research paper is to attempt to show how development activities around Lake Ziway area are raising environmental and health concerns and how these environmental concerns are affecting the livelihood of fishermen who rely on Lake Ziway to fulfill their basic needs. Accordingly, the study evaluates international, regional and national laws in relation to the right to clean and healthy environment and other human rights concerning the fishermen.

The specific objective of this thesis is to see how the right to livelihood and various other human rights of the fishermen is being affected as the result of chemical effluents, siltation, excessive water abstraction etc., created by the large scale and small scale irrigation practices around the shore of the lake. At the end of the study, the researcher attempts to make recommendations for the problems observed during the course of the study.

1.5. Research Questions

The research tries to answer environmental concerns around Lake Ziway area. In particular, the researcher attempts to answer the following questions and concerns.

- a) What are causes of environmental problems in Lake Ziway area?
- b) What are the impacts of the environmental concerns on the livelihood of fishermen?
- c) What are the international, regional and national laws applicable to address the problems?
- d) What are the possible solutions to the environmental problems?
- e) What could be the role of the government and the local administration to alleviate the existing environmental concerns and solve the livelihood issues of the fishermen?
- f) Do the strategies for sustainable development in the context of environmental rights give due attention to fishing as one form of livelihood?

1.6. Methodology

This research is a socio-legal research and the researcher has employed different forms of methodologies depending on the type of the research question attempted to be answered. Accordingly, the researcher has examined laws and international instruments, and other primary sources such as, survey questionnaire, field observation, interviews and discussions with

pertinent persons or organizations. The researcher also has used secondary sources of published and unpublished materials on the issues raised. Therefore, the research work has involved:

- a) Observation of floriculture and horticulture activities around Lake Ziway Area.
- b) Observation of Lake Ziway to see the extent of the volume of the lake before and after the rainy season.
- c) Interviews and discussions with different government officers such as, Oromia National Regional State Batu Town Environmental Protection, Forestry and Climate Change Authority, Adami Tullu Jido Kombolcha Woreda Environmental Protection Office, Oromia Agricultural Research Institute Batu Fishery and other Aquatic Life Research Center, Sher Ethiopia flower farm, Castel winery, FDRE Rift Valley Lakes basin Authority Batu/Ziway Branch office.
- d) Focus group discussion with Ziway town fishermen, Key informant interview.
- e) Interview with Oromia Environmental, Forestry and Climate Change Authority.

1.7. Significance of the Research

The researcher believes that this research is significant in a number of ways. Firstly, the researcher believes that less attention is given to the environmental concerns around Lake Ziway area and more focus is given to economic development and job creation. Thus, the research has attempted to enlighten readers about the environmental problems that Lake Ziway is facing, especially the effect of the environmental problems of Lake Ziway on the livelihood of fishermen.

There are a few researches conducted on Lake Ziway. However, almost all these researches focus on the water quality and impact of degradation of the Lake on fish resources. Therefore, since this research is a socio-legal research, it has attempted to see the environmental problems observed in the context of the applicable international, regional and national laws. Secondly, this research could serve as a basis for any interested researcher who wants to explore more on the issues raised.

1.8. Scope and Limitations of the Research

The main concern of this study was to investigate what the right to clean and healthy environment constitutes and environmental concerns surrounding Lake Ziway and the resulting impact of these environmental concerns on the livelihood of fishermen who rely on the Lake's fishery to support their livelihood. Accordingly, the researcher has investigated international, regional and national environmental laws in the context of the environmental concerns in the study area. Survey questionnaire and focus group discussion have also been conducted to gather information from the fishermen concerning the effects of the environmental problems on their livelihood. However, the researcher does not claim to be exhaustive on the issues and all international, regional and national laws and policies have not been discussed.

In the course of the study, the researcher has encountered many problems. For instance, the fishermen were unwilling to give information initially saying that they were tired of giving interviews which bear no fruit. Moreover, some of the concerned organizations and authorities were reluctant to give information. The researcher was even requested to provide letter to ascertain that he was not a journalist. Moreover, less available researches on the research theme have been limitations.

1.9. Ethical considerations

During data collection which required permission of individuals or authority, the researcher has taken due care to get the permission and to properly preserve and to take appropriate measures to any possible harmful information during the data collection process. Anonymity and confidentiality have been taken as core research ethics throughout the research. Moreover, in the interpretation of data, the researcher has provided an accurate account of the information and has not used language or words or information that are biased against persons or institutions on any account.

1.10. Organization of the Research

Chapter one of the research is the Introduction of the research. It gives background about environmental concerns around Lake Ziway Area, description of the study area, scope and limitation of study and the methods used to investigate the problems.

Chapter two of the research deals with review of literature. This chapter is divided into two sections. In the first section the researcher has tried to examine works of other researchers on the right to clean and healthy environment. Moreover, attempt has also been made to examine the connection between environmental rights with other human rights such as the right to life, right to livelihood, and the right to development. Accordingly, international, regional and national laws on the issue have been observed briefly. In the second section, environmental issues Surrounding Lake Ziway have been discussed. Accordingly, various literatures on environmental issues such as pollution, siltation, water depletion... around Lake Ziway area have been observed.

Chapter three states the methodology and methods of the research, followed by the fourth chapter that deals with the analysis of interview and observation results in lights of the legal issues addressed under chapter two. In the last chapter the researcher has forwarded conclusion of the research findings and also recommendations have been made to the problems observed during the course of the study.

Chapter Two

The Legal Regime, Literature Review and Empirical Overview

This chapter includes two major parts. The first part (Sections 2.1 to 2.9) discusses the international, regional and national legal regime along with some review of literature. The second part (Section 2.7) focuses on empirical review that relate to Lake Ziway.

Part One

The Right to Clean and Healthy Environment: International, Regional and National Perspectives

2.1. Human Rights Approaches to Environmental Protection

Though there is an argument as to the existence of international human right of the right to clean environment, there are a range of general human rights provisions that have relevance in the area of environment, such as the right to life, right to an adequate standard of living, right to health, right to food and so forth.³⁷ However, according to Shaw, specific references to a human right to a clean environment have tended to be few and ambiguous.³⁸ Therefore, there are arguments as to the viability of existing general human rights laws in achieving environmental rights. Hence, the effort to ensure environmental rights could take different approaches. These approaches are first, mobilizing existing rights to achieve environmental ends; secondly, reinterpreting existing rights to include environmental concerns; and thirdly, creating new rights of an explicitly environmental character.³⁹

According to the first approach, human rights norms under existing international human rights instruments and domestic laws could be mobilized to ensure protection of the environment. In view of this approach the body of existing rights at the international level is detailed and comprehensive. Thus, the range of rights including: firstly, civil and political rights; secondly,

³⁷Malcolm N.Shaw, *supra* note 14, p.847.

³⁸ *Ibid*

³⁹Donald K.Anton and Dinah L.Shelton, Environmental Protection and Human Right (2011), p.134.

economic, social and cultural rights; and thirdly, the right to self-determination could be mobilized and play major role to protect the environment, thereby achieve the right to clean environment.⁴⁰ For instance, the Civil and Political rights enshrined under ICCPR help to foster an environmental friendly political order. Realization of civil and political rights includes the right to life, association, expression, political participation, personal liberty, and legal remedy. For instance, realization of association rights could help farmers to establish an association that strives to protect their degraded environment. Realization of expression right helps the farming community to make their voice heard about the environmental problems in their locality. Participation right helps to ensure local communities right to participate in the assessment of development projects that might affect their environment. The existence of a legally established judicial system which is independent and impartial could help render effective remedy to persons whose lives have been affected due to environmental damage by government or private companies.

Economic, social and cultural rights enshrined under the ICESCR also could help to ensure substantive standards of human well-being. Some of the rights enshrined under the ICESCR include, the right to health, the right to decent living condition, the right to decent working environment. For instance, effective implementation of the right to health obliges the State to protect its peoples from poisonous environment. Or effective implementation of the right to education helps to raise the people's awareness about the impact of pollution, environmental degradation...

The right to self-determination includes economic self-determination. And using this right, States could provide a legal framework that enables them to restrain environmentally degrading foreign investment. The concept of self –determination is also important to protect natural resource rights of vulnerable groups such as indigenous peoples.

In view of the second approach, mere mobilization of existing human rights norms is not sufficient to effectively ensure environmental rights. They argue that though existing human rights standards do provide some weapon in the protection of the environment, these existing rights must be interpreted in the context of environmental concerns which were not prevalent at

⁴⁰ Ibid

the time when they were formulated. For instance, the right to life is infringed when the State fails to stop the emission of highly toxic substance into drinking water supply.

This approach has been widely used by Indian Courts by interpreting their Constitutional provisions in the context of environmental laws. Indian judges directly state that the right to life includes the right to live in a healthy environment, a pollution-free environment, and an environment in which ecological balance is protected by the State.⁴¹

The right to equality may also be interpreted as the right to equal access to environmental resources and equal protection of the environment. This is because unequal protection of the environment could lead to unequal protection and enjoyment of environmental rights. Most States address problems of the affluent and set aside problems of the poor. Thus, when a policy is adopted the state must take into consideration affluence and poverty problems equally.⁴²

In view of the last approach, although effective application of established existing human rights norms could help to foster global and local protection of the environment, they are oblique and lack precision to serve as the proper tools for urgent environmental tasks.⁴³ Therefore, they argue that a comprehensive norm, which relates directly to environmental goods, is required.⁴⁴

Despite the different approaches used to ensure environmental protection and enjoyment of environmental right, it must be noted that, as clearly stated in the Vienna Declaration and Program of Action, human rights are interdependent, interrelated, and indivisible. Hence, the implementation or otherwise of environmental rights have direct impact on the enjoyment of other human rights.

2.2. Environment Rights under International Bill of Rights

International human rights instruments do not provide environmental rights in an express manner. However, there are a range of provisions that have direct relevance to the right to clean

⁴¹Donald K.Anton and Dinah L.Shelton, *supra* note 39, p.135.

⁴² *Ibid*

⁴³ *Ibid*

⁴⁴ Though the scholars agree on a new and comprehensive norm that directly relates to environment, they argue, however, on whether this norm should be substantive or procedural.

and healthy environment. These rights include the right to life, right to an adequate standard of living, right to health, right to food...⁴⁵

2.2.1. The Universal Declaration of Human Rights

The UDHR does not make express reference to environmental rights. However, there are some provisions which are quiet relevant in the context of environmental rights. If we employ wider interpretation of the right to life in the context of environmental rights, Art.3 of the Declaration, and most importantly Art. 25(1) could be relevant.⁴⁶ For instance, Art. 25(1) reads: “Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care...” Having a standard of living where a person’s health and well-being is protected depends on a clean and healthy environment. Thus, clean and healthy environment is a pre-requisite for the enjoyment to all other human rights.

Art. 3 of the UDHR also provides that “everyone has the right to life...” Life is also dependent on the existence of an environment that is suitable to live in. Some jurisdictions also interpret the right to life to include environmental rights. For instance, Indian Courts and some South American courts are famous for interpreting the content of the right to life to include environmental rights.

Moreover, the relationship and interdependence of the right to life and the environment has also been briefly stated by preambular part of the Stockholm Declaration. The preamble of the declaration para 1 reads: “...both aspects of man's environment, the natural and the manmade, are essential to his well-being and to the enjoyment of basic human rights-even including the right to life itself.”

Therefore, as Bekele stated in the absence of express reference to environmental right under international human rights laws, the Stockholm Declaration’s approach in creating link between human rights and environmental rights with the right to life could be used as guideline.⁴⁷

⁴⁵Malcolm N.Shaw, supra note 14, p.847.

⁴⁶BekeleTekle, supra note 10,p.97.

⁴⁷ Id, p.100.

2.2.2. International Covenant on Civil and Political Rights

The ICCPR also does not make express reference to environmental right. However, some of the provisions could be interpreted in the context of environmental rights. For instance, the right to life is one of the fundamental human rights recognized by the 1966 International Covenant on Civil and Political Rights. Article 6(1) of this Covenant guarantees every individual's inherent right to life. Though the provision does not make express reference to environmental rights, it could, however, be interpreted to include positive and negative obligations in the context of environmental issues.⁴⁸

For instance, the reading of Art. 6(1) seems to simply refer to the physical protection of an individual against death. However, the right to life is far from protection against death or deprivation of life.⁴⁹ The fulfillment of the right to life imposes upon States positive obligation to protect the right to life of peoples. For instance, States have the obligation to take measures in case a particular environmental risk threatens the lives of people.⁵⁰ This is because human rights, especially the right to life and environment are interrelated.

The Human Rights Committee in its general comment number 36 has also expressly recognized that the implementation of the obligation to respect and ensure the right to life, under Art. 6 of the ICCPR and in particular life with dignity, depends, inter alia, on measures taken by States parties to preserve the environment and protect it against harm, pollution and climate change caused by public and private actors.

Judicial institutions enforcing human rights standards have also concluded that safe and healthy environment as a pre-requisite for the enjoyment of all other human rights⁵¹. Environmental protection is perceived by various national and international judicial institutions as an essential for the equal enjoyment of the right to life, health, adequate standard of living, home life and

⁴⁸ Emma A. Imparato, *The Right to Life Passes through the Right to a Healthy Environment: Jurisprudence in Comparison*, 22 *Widener L. Rev.* 123 (2016) p.3-5 available at: http://heinonline.org/HOL/Page?handle=hein.journals/wlsj22&div=8&start_page=123&collection=journals&set_as_cursor=0&men_tab=srchresults (accessed on Feb 15, 2018)

⁴⁹ Bekele, supra note 10, p.97,98

⁵⁰ Nihal Jayawickrama, *The Judicial Application of Human Rights Law, National, Regional and International Jurisprudence*, (2002), p.258, 259.

⁵¹ Donald K. Anton and Dinah L. Shelton, supra note 39, p.436.

property.⁵²Therefore, the expression “inherent right to life” under Art. 6(1) of ICCPR cannot properly be understood in a restrictive manner, and the protection of this right requires that States adopt positive measures⁵³.

With respect to interpreting the right to life widely, Indian courts are famous in their various notable cases. For instance, in *Indian Council for Enviro-Legal Action v. Union of India*, the government of India was accused of violating the right to life of the villagers. In a small village called Bichhri, there was large industrial complex known as the Hindustan Zink Limited. The problem in this case occurred when Silver Chemicals and Jyoti Chemicals, respondents in the above complex, started to produce “H” acid. The production of “H” acid led to high iron and gypsum based sludge toxic effluents. Since untreated toxic sludge from “H” acid production was allowed to flow out freely to the open environment, the toxic substances had percolated deep into the bowels of the earth polluting supply of water rendering it unfit to human consumption. It has also become unfit for cattle to drink and irrigating the land. It spread disease, death and disaster in the village and the surrounding areas.⁵⁴

The Court noted that it had the obligation to intervene to protect the lives of individuals where the local governments failed to discharge their statutory obligations that seriously undermined the lives of the Bichhri residents as indicated under article 21 of the Indian Constitution.⁵⁵Thus, it held that the respondents were liable for the damage to the soil, to the underground water and to Bichhri residents in general, and the court rendered various remedies including compensation and closure of the facilities.

The right to life also includes the right to livelihood and the protection of the means by which life could be lived. For instance, changes in the ecosystem due to environmental damage could cause loss of resources or access to resources or livelihoods. Loss of livelihood also has a direct impact on the enjoyment of the right to life of individuals. Loss of livelihood causes rise in the poverty level, malnutrition, and deterioration of health...Thus, the right to life is a wide concept that also incorporates the right to livelihood.

⁵² Ibid

⁵³ Emma supra note 48, p.3-5

⁵⁴ Ibid

⁵⁵ Ibid

When it comes to livelihood right, it is expressly recognized under various international human rights treaties as the right to work⁵⁶. The right to work also exists implicitly as an integral part of a number of other rights which depend on livelihood for their realization some such rights are right to life,⁵⁷ right to dignity,⁵⁸ right to food⁵⁹, right to adequate standard of living,⁶⁰ right to health,⁶¹ right to housing....⁶² All these rights have significant relevance especially in the context of environmental degradation in which right to livelihood is being observed in this thesis.

The idea of widely interpreting the right to life to include livelihood has also been advocated by different judicial institutions most notably Indian courts.⁶³In a notable Indian case famously known as the pavement dwellers' case, the Supreme Court of India observed if the right to life included the right to livelihood. In this case, the Bombay Municipal Corporation demolished the shelter of a group of slum and pavement dwellers in the city of Bombay. These dwellers in which some were evicted forcibly argued that their fundamental right to life was violated. The petitioners argued that they had no option except to migrate to big cities like Bombay, which according to them, provided them with bare subsistence. And that they chose pavement or slum as it was nearest to their place of work.⁶⁴ Moreover, the dwellers contended that they had the right to live and that they could not exercise their right to life without means of livelihood.⁶⁵ Thus, they averred that the right to life was illusory without a right to the protection of the means by which life could be exercised.⁶⁶

The Court which was left with the question whether the right to life included the right to livelihood held that:

⁵⁶International Covenant on Economic, Social and Cultural Rights, 1966, Articles 6, 7; International Covenant on Civil and Political Rights, 1966, Article 8 (3); International Convention on the Elimination of all forms of Racial Discrimination, 1965, Article 5 (e) (i); Convention on the Elimination of all forms of Discrimination against Women, 1979, Article 11 (1); Convention on the Rights of the Child, 1989, Article 32; Convention on the Protection of all Migrant Workers and members of their Families, 1990, Articles, 11, 25, 26, 40, 52, 54.

⁵⁷ International Covenant on Economic, Social and Cultural Rights, 1966, Articles 6, 11, 12;

⁵⁸ Universal Declaration of Human Rights, 1948, Article 1; International Covenant on Civil and Political Rights, 1966, Article 10, "Right to Work," General Comment 18, 2005, CESCR, paragraph, 1.

⁵⁹ International Covenant on Economic, Social and Cultural Rights, 1966, Article 11.

⁶⁰ Ibid, Article 11

⁶¹ Id, Article 12

⁶² Article 11, "The Right to Adequate Housing," General Comment 4, 1991, CESCR, paragraph, 7

⁶³ Ibid

⁶⁴Vanitha , supra note 27, see also Nihal Jayawickram, supra note 50, p. 258

⁶⁵ Ibid

⁶⁶ Ibid

The sweep of the right to life conferred by article 21 is wide and far reaching. It does not mean merely that life cannot be extinguished or taken away as, for example, by the imposition and execution of the death sentence, except according to procedure established by law. That is but one aspect of the right to life. *An equally important facet of that right is the right to livelihood because no person can live without the means of living, that is, the means of livelihood.* If the right to livelihood is not treated as a part of the constitutional right to life, the easiest way of depriving a person of his right to life would be to deprive him of his means of livelihood to the point of abrogation. Such deprivation would not only denude the life of its effective content and meaningfulness but it would make life impossible to live. And yet, such deprivation would not have to be in accordance with the procedure established by law if the right to livelihood is not regarded as a part of the right to life. That which alone makes it possible to live, leave aside what makes life liveable, must be deemed to be an integral component of the right to life. Deprive a person of his right to livelihood and you shall have deprived him of his life.⁶⁷ (emphasis added)

The above decision of the Supreme Court of India has been employed to resolve a number of other related issues.

The impact of environmental destruction on the right to life and livelihood of individuals have also been elaborated by the African Commission on Human and Peoples' Rights in *Social and Economic Rights Action Centre (SERAC) and Another v Nigeria*.⁶⁸ This is the best known Communication submitted to the African Commission on Human and Peoples' Rights, in which the Commission dealt with the consequences of environmental damage in the Ogoni land and the obligation of States with respect to the realization of the right.

In this case, the Nigerian government was accused of violating the right to life, health, food, property, environmental rights and wide range of other rights. Details of the Communication were that the military government of Nigeria had been directly involved in oil production through the State oil company, the Nigerian National Petroleum Company (NNPC) together with Shell Petroleum Development Corporation (SPDC) in the Ogoni region.

The Communication alleged that the oil consortium has exploited oil reserves in Ogoni land with no regard for the health or environment of the local Ogoni people, disposing toxic wastes in the environment and local water ways, in violation of applicable international environmental standards. The resulting contamination of water, soil and air has had serious short- and long-term

⁶⁷ Id, p.25

⁶⁸ Decision of the African Commission on Human and Peoples' Rights, *Social and Economic Rights Action Centre (SERAC) and Another v Nigeria*(2001) AHRLR 60 (ACHPR 2001)

health impacts, including skin infections, gastrointestinal and respiratory ailments, increased risk of cancers, and neurological and reproductive problems.⁶⁹

The Communication also alleged that the Nigerian government neither monitored operation of the oil companies nor required them safety measures that are standard procedure within the industry.⁷⁰ The government had not required oil companies or its own agencies to produce basic health and environmental impact studies regarding hazardous operations and materials relating to oil production, despite the obvious health and environmental crisis in Ogoni land. The government had even refused to permit scientists and environmental organizations from entering Ogoni land to undertake such studies.

The African Commission held that the pollution and environmental degradation in the Ogoni land was a nightmare and humanly unacceptable. It further stated that the survival of the Ogonis depended on their land and farms that were destroyed by the direct involvement of the government. These and similar atrocities not only persecuted individuals in Ogoni land but also the Ogoni community as a whole. They affected the life of the whole of the Ogoni society.⁷¹

Thus, the Nigerian government was held liable for the contamination of air, water and soil and thereby harming the health, life, right to food and a wide range of other rights of the Ogoni population.

When it comes to Ethiopia, the country has adopted and ratified, all the above discussed major human rights instruments, both at the UN and OAU/AU level. And these international and regional instruments to which Ethiopia is a party are considered as part and parcel of the law of the land⁷². Concerning the interpretation of these international instruments the Constitution provides that they should be interpreted in a manner conforming to the principles of the Universal Declaration of Human Rights, International Covenants on Human Rights and International instruments adopted by Ethiopia.⁷³

⁶⁹ Id, para 2.

⁷⁰ Id, para 3.

⁷¹ Id, para 67.

⁷² Art. 9(4) of the FDRE Constitution, *supra* note 6.

⁷³ Id, Art. 13(2).

In addition to being a party to major human rights instruments, Ethiopia has also enacted a Constitution. This Constitution recognizes that every person has the inviolable and inalienable right to life. And No person may be deprived of his life except as a punishment for a serious criminal offence determined by law⁷⁴. Moreover, the Constitution under Art. 41, recognizes the right to livelihood, which is a basic right for the realization of many other rights.

Though the FDRE Constitution recognizes both the right to life and livelihood, their content and scope is vague. This is because the right to life and livelihood in environmental right context has never been entertained neither by judicial organs or quasi-judicial organs such as the house of federation⁷⁵. Therefore, the researcher claims that reference has to be made to international instruments and principles and cases of regional and international tribunals pursuant to Art. (13) of the Constitution.

In general, the right to life is a supreme right whose effective protection is a prerequisite for the enjoyment of all other rights. In this regard effective protection of the environment is also necessary as human beings are dependent on the environment and its resources for their very survival.

2.2.3. International Covenant on Economic Social and Cultural Rights

The ICESCR, compared to ICCPR has some provisions that have direct relevance to the right to clean and healthy environment. For instance, Article 11 (1) of ICESCR specifically provides that the States Parties “recognize the right of everyone to an adequate standard of living for himself and his family, including adequate food, clothing and housing, and to continuous improvement of living conditions.” Freedom from hunger, which is absolutely essential for subsistence, is also recognized in the Covenant⁷⁶. Moreover, Art.12 (1) states that:

The States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health.

Sub Art.2 of Art. 12 provides the steps that States have to take for the effective realization of the provisions of Art.12(1), and one of the steps that a State has to take is “[t]he improvement of all

⁷⁴FDRE Constitution Art. 14 and 15

⁷⁵ Abdi Jibril, “The Right to Development in Ethiopia”, in Human Rights and Development: Legal Perspectives from and for Ethiopia, International Studies in Human Rights, (2015) Eva Brems, et.al (ed.), vol.111, p.68.

⁷⁶International Covenant on Economic, Social and Cultural Rights, 1966, Articles 11(2)

aspects of environmental and industrial hygiene.” These provisions are quite important since they give emphasis to the relationship between healthy environment and protection of life. Thus, as Bekele explained it, the objective of achieving the highest standard of physical and mental health cannot be achieved except by abating environmental ills.⁷⁷

Rights enshrined under Art. 11(1) and Art.12, i.e., the rights to adequate food, clothing and housing, and to the continuous improvement of living conditions, and the right to health, respectively, are *sine qua non* to the enjoyment of the right to life. And these rights, which are concerned with human well-being, have direct relation with the right to clean environment. Therefore, human well-being cannot be achieved without environmental well-being. In reaffirming this relationship the Stockholm Declaration preambular part para 2 reads that: “The protection and improvement of the human environment is a major issue which affects the well-being of peoples...”

According to Nihal, the requirement of all aspects of environmental hygiene under Art.12(2)(b) of ICESCR requires a State to take positive measures for the prevention and reduction of the population’s exposure to harmful substances such as radiation and harmful chemicals or other detrimental environmental conditions that directly or indirectly impact upon human health.⁷⁸

2.3. Environmental Rights under Regional Human Rights Systems

The relationship between the physical environment and the right to life and other human rights and States’ obligation in the context of development projects have been given due recognition by the Organization of American States (OAS).⁷⁹ The Inter-American Commission on Human Rights and the Inter-American Court of Human Rights have developed unique rights and obligations with the view to protect indigenous peoples from environmental impacts of development projects.⁸⁰

The American Convention on Human Rights (ACHR) was adopted in 1969 and came into force in July 1978. The ACHR draws inspiration from UDHR and other human rights systems. The ACHR does not make express reference to environmental right. Express reference to

⁷⁷ Bekele supra note 10, p.99.

⁷⁸ Nihal Jayawickrama, supra note 50, p.887.

⁷⁹ Donald K.Anton and Dinah L.Shelton, supra note 39, p.577.

⁸⁰ Ibid

environmental right is made under the Additional Protocol to the ACHR-the Protocol of San Salvador, approved on 17 Nov, 1988. The Protocol under Art. 10, recognizes the right to a healthy environment. There are also a number of environmental cases brought to Inter-American Commission on Human Rights. For instance, one of the earliest environmental cases brought to Inter-American Commission on Human Rights concerning the problem of the indigenous peoples' was the *Yanomami v. Brazil* case. In this case the government was alleged for violating the American Declaration on the Rights and Duties of Man by constructing highway through the Yanomami and allowing the exploitation of the their resources. According to the petitioners the government's action led to the influx of non-indigenous peoples who brought communicable diseases to the Yonamami that remained untreated because of lack of medical case.⁸¹

The Commission held that the government had violated the Yanomani's rights to life, liberty, and personal security guaranteed by article 1 of the Declaration, as well as the right of residence and movement (article 8) and the right to the preservation of health and well-being (article 11).⁸²

After the Yanomami case, the Inter-American Commission on Human Rights issued country report on Ecuador which expanded the governments' obligation concerning indigenous peoples, especially in the context of environment and development projects.⁸³

According to the report compiled by the Commission, Ecuador exploited oil and mineral deposits either directly through Petro Ecuador or through concessions and service contracts with foreign oil companies.⁸⁴

The exploitation of oil resources has had enormous impact on the region and its people. Representatives of the communities near the oil exploration areas told the Commission that members of the communities suffered from skin disease, rashes, chronic infections and fevers, gastrointestinal problems, and that their children suffered frequent bouts of diarrhea as the result of exposure to contaminated water, soil and air. Moreover, they alleged that contamination of the physical environment had impacted (hindered) their ability to feed their family members. For instance, contamination of the river, stream and lakes has contaminated the fish resources. The

⁸¹ Ibid

⁸² Ibid

⁸³ Ibid

⁸⁴ Ibid

Commission also had received reports that animals raised by the settlers either for sell or food had become sick or had died as the result of drinking the contaminated water.⁸⁵

The communities alleged that the government failed to regulate and supervise both State owned and non-State owned oil companies according to the existing laws and policies. Thus, *their right to life and to live in a contamination free environment was violated.*⁸⁶

The Commission after scrutinizing the applicable international instruments to which Ecuador is a party, including the ICCPR, ICESCR, the Additional Protocol to the American Convention in the Area of Economic, Social and Cultural Rights, and Stockholm Declaration, held that the realization of the right to life, and to physical security and integrity is necessarily related to and in some ways *dependent upon one's physical environment.*

The tenet of the analysis and conclusion of the Commission is that where there is environmental contamination and degradation, they pose a persistent threat to human life and health and livelihood sources. Thus, the right to life, liberty, and security under Art.I, and the right to health under Art. XI were implicated. Thus, the Commission held that since the right to life of the residents has been infringed upon by environmental contamination, the Government was obliged to respond with appropriate measures of investigation and redress.⁸⁷

Coming to Africa, the African Charter on Human and Peoples' Rights (ACHPR) which was adopted in June 1981 and became into force in 1986 recognizes environmental right. Especially in the context of a healthy environment Art. 16 and Art.24 of the ACHPR are quite relevant. For instance, Art.16 (1) reads: "Every individual shall have the right to enjoy the best attainable state of physical and mental health. Art. 16(2) provides that States parties to the present Charter shall take the necessary measures to protect the health of their people and to ensure that they receive medical attention when they are sick." Moreover, Art. 24 reads: "All peoples shall have the right to a general satisfactory environment favorable to their development."

In *Social and Economic Rights Action Centre (SERAC) and Another v Nigeria*, the African Commission has also reaffirmed the importance of the right to a clean and safe environment to

⁸⁵Donald K.Anton and Dinah L.Shelton, *supra* note 39, p.578.

⁸⁶ *Ibid*

⁸⁷ *Id*, p.579.

the enjoyment of a quality life. The Commission in explaining satisfactory environment cited Alexander Kiss's statement which reads:

An environment degraded by pollution and defaced by the destruction of all beauty and variety is as contrary to satisfactory living conditions and the development of personality as the breakdown of the fundamental ecologic-equilibria is harmful to physical and moral health.

The African Commission also clearly stated that international law and human rights must be responsive to African circumstances. Moreover, the Commission held that collective rights such as environmental rights were essential elements of the African Charter. The Commission further stated that there is no right in the African Charter that cannot be made effective.

2.4. The Right to Development, Environment and Human Rights

Every country in the world desires to bring about economic development. This desire, however, is very high in developing and least developed nations. In order to bring about economic development, States may take various measures. In this respect least developed nations seems to turn every stone to bring about economic development⁸⁸. However, as explained by Dejene, unless some kind of precautionary measures are taken some of the measures taken to bring economic development may be destructive to the environment⁸⁹. And degradation of natural resource base leads to persistent decline in the socio-economic conditions of local communities. And the loss of livelihood could cause rise in poverty level, malnutrition, and deterioration of people's health. Moreover, environmental degradation, could lead to resource depletion creating scarcity problems for the next generation. And large number of populations especially the poor is immensely affected by environmental problems. Thus, there needs to be a balance between development effort and protection of the environment.

The UNGA in its resolution no. 2849(XXVI) 1971 expressed that "development plans should be compatible with a sound ecology and that adequate environmental conditions that can be ensured by the promotion of development both at the national and international levels". The Stockholm Declaration in its preambular part para.2 also stresses on the need to protect the environment to ensure economic development. It reads: "*The protection and improvement of the human*

⁸⁸ See Dejene Girma, "The Place of Environmental Protection in the Growth and Transformation Plan of the Federal Democratic Republic of Ethiopia", *Oromia Law Journal*, Vol.2 No.2, (2005), p.1-31.

⁸⁹ Ibid

environment is a major issue which affects *the well-being of peoples and economic development* throughout the world...” (emphasis added). Moreover, principle 13 of the Declaration reads that “...States should adopt an integrated and co-ordinated approach to their development planning so as to ensure that development is compatible with the need to protect and improve environment for the benefit of their population...”

The Rio Declaration principle 4 also states that “In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.”

Hence, for development to be real and meaningful, it has to be sustainable.⁹⁰ In other words development activities should be conducted in a way that meets the needs of the present generation and without compromising the ability of future generations to meet their own needs.⁹¹ Moreover, consideration of environmental values in development endeavors helps to the achievement of another objective i.e. attainment of the right to clean and healthy environment. Consideration of environmental values does not only lead to the realization of sustainable development and the attainment of the right to clean and healthy environment, it also helps to for the realization of all other human rights.⁹²

When it comes to Ethiopia, the country like other developing and least developed countries, is desperately striving to bring about economic development. The country’s decision to construct mega projects, such as, the Renaissance dam, sugar factories, fertilizer factories...manifest how desperate the country is to economically develop and attain its constitutional objective of raising the living standards of its citizens and *to enhance the capacity of citizens for development and to meet their basic needs*⁹³. Moreover, the country is providing various incentives both to domestic and foreign investors to invest in the country. Using these incentives, a number of investors are engaged in various economic activities, such as agriculture, manufacturing....

⁹⁰The Rio Declaration principle 3 also provides that “the right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations”.

⁹¹Abdul Ghafoor Awan (2013), Relationship Between Environment and Sustainable Economic Development: A Theoretical Approach to Environmental Problems, International Journal of Asian Social Science, pp. 741-761 Available at: <http://aessweb.com/pdf-files/741-761.pdf> (Access on 5 July, 2018)

⁹²See Dejene Girma “The Chance to Improve the system of EIA in Ethiopia: A Look at the New Investment Proclamation”, Oromia Law Journal [Vol 3, No. 1], (2005), p.134-159.

⁹³Belay Getachew, supra note 1, p.26.

However, it is doubtful if these investors engaged in various agriculture and manufacturing activities are making every effort to protect the environment and avoid pollution and implement sustainable use of natural resources (water, soil, air, etc.).⁹⁴ For instance, around Lake Ziway, which is the focus of this thesis, though there are a number of investors engaged in different economic activities, there is huge environmental concern because of the effluents released from these economic activities. And these environmental concerns are violating the well-being of the communities who rely on the lake's resources for their survival.

In general, development efforts should take into account environmental concerns and the implementation of development projects should not deprive communities' means of subsistence. Moreover, prior-environmental impact assessment and consultation with the communities which are likely to be affected by the implementation of development activities should be conducted. In this regard, in a notable decision of the African Commission in the matter between *Centre for Minority Rights Development and Others v. Kenya (Endorois case)*, the Commission was of the view that any development or investment projects that would have a major impact within the Endorois territory, Kenya has the duty not only to consult with the community, but also to obtain their free, prior, and informed consent, according to their customs and traditions.⁹⁵

2.5. Governments' General Obligations In The Context of Environmental Rights

Human rights are more than mere political commitments, since they are enshrined in international legal documents that create binding obligations on duty-bearers and empower right-holders.⁹⁶

The general consensus with regard to the obligations that human rights entail indicates that *all human rights* generate at least four levels of duties for the State that becomes part of that human rights instrument. These duties are the duty to respect, protect, promote and fulfill. These four layers of duties universally apply to all rights and they also entail a combination of negative and

⁹⁴ See Elias Nour (2012), The Investment Promotion and Environment Protection Balance in Ethiopia's Floriculture: The Legal Regime and Global Value Chain (PhD Thesis, University of Warwick, School of Law (9 December 2012), UK

⁹⁵ Abdi Jibril, *supra* note 75, p.79.

⁹⁶ Eva Brems, et.al.,(ed.) Human Rights and Development: Legal Perspectives from and for Ethiopia, International Studies in Human Rights, (2015), Vol.111, p.1.

positive obligations.⁹⁷ Therefore, human rights approach to environmental rights does not create new obligations to State parties rather it tries to exploit the existing human rights obligations to ensure the protection of environmental rights.

Thus, the above four layers of obligations are also applicable in the context of environmental rights. These obligations are essential since they oblige the government to protect the environment for the benefit of both the current and the coming generations. Thus, obligation to respect requires States to refrain from interfering directly or indirectly with the enjoyment of the right to clean and healthy environment. Therefore, the State is obliged not to pollute the water, soil, air and others aspects of the environment.⁹⁸ The obligation to protect requires States to take measures that prevent third parties from interfering with the right to clean and healthy environment of individuals. Therefore, States are obliged to protect its citizen from water, air, soil or other pollutions that may be attributed by third parties.⁹⁹ The obligation to fulfill is more of a positive expectation on the part of the state to move its machinery towards the actual realization of the rights.

2.6. Some Legal Perspectives Relevant to the Research Theme

Ethiopia is one of the countries that gave Constitutional recognition to the right to clean and healthy environment.¹⁰⁰ Art. 44(1) of the Constitution provides that “All persons have the right to a clean and healthy environment.” Besides giving Constitutional recognition to the right to clean and healthy environment, the Constitution under Art. 92 imposes on the government the obligation to give effect to the right to clean and healthy environment and to make sure that development activities do not result in environmental harm. The provision also ensures the rights of the peoples to be consulted and to participate in the planning and implementation of policies and projects that could have environmental impact.¹⁰¹

Ethiopia is also a State party to major international and regional human rights instruments. In this regard, Art. 9(4) of the Constitution provides that all international agreements ratified by Ethiopia shall be integral part of the law of the land. Moreover, Art. 13(2) of the Constitution

⁹⁷*Social and Economic Rights Action Centre (SERAC) and Another v Nigeria*, supra note 19, para.44.

⁹⁸ Ibid

⁹⁹ Ibid

¹⁰⁰ Ministry of Foreign Affairs, supra note 15, p.122.

¹⁰¹ FDRE Constitution, supra note 6, See Art. 41, 42, 43, 89, 91, 92

directs that fundamental rights and freedoms enshrined in the Constitution should be interpreted in a manner conforming to the principles of the UDHR, International Covenants on Human Rights and International instruments adopted by Ethiopia.”

The obligation to enforce these fundamental rights and freedoms is imposed upon all State and federal government offices. In this respect Art. 13(1) reads “all Federal and State legislative, executive and judicial organs at all levels shall have the responsibility and duty to respect and enforce the provisions of this Chapter.” Thus, State and Federal officials besides respecting environmental rights themselves, they have also the obligation to ensure the implementation of these rights.¹⁰²

According to Mulugeta, the incorporation of environmental rights, policies and strategies (Art. 41, 42, 43, 89, 91, 92) into the supreme law of the land raises environmental issues to the level of fundamental human rights.¹⁰³ However, he criticizes the absence of implementing mechanisms such as laws, policies and institutions that are needed to realize the rights. According to him, consultation and community participation issues incorporated in the Constitution require subordinate laws to effectively enforce them.¹⁰⁴ Moreover, lack of political will on the part of the government to practically utilize the existing laws and mechanism should also be noted here as a challenge.

With the view to ensure environment related rights of peoples, Ethiopia has taken legislative measures. Moreover, it has adopted various policies and strategies which their overall goal is to protect the environment, improve and enhance the health and quality of all Ethiopians and promote sustainable economic development through sound management of natural resources and environment. For instance, according to the 1997 Environmental Policy of Ethiopia, its overall goal is:

to improve and enhance the health and quality of life of all Ethiopians and to promote sustainable social and economic development through the sound management and use of natural, human-made and cultural resources and the environment as a whole so as to meet the needs of the present generation without compromising the ability of future generations to meet their own needs.

¹⁰² Id, Art. 9(4) and Art.13(1)

¹⁰³Getu, Mulugeta “Defiance of environmental governance: environmental impact assessment in Ethiopian floriculture industry”, E3 Journal of Environmental Research and Management Vol. 4(4) (2012), pp. 0219-0229.

¹⁰⁴ Ibid

The specific objectives of the policy also deal with exploitation of both renewable and non-renewable resources of the country taking into account the social, economic and environmental costs and benefits of developing natural resources into planning and implementation; preventing water, soil and air pollution, ensuring empowerment and participation of peoples in environmental policies; and raising public awareness and promoting understanding of the essential linkages between environment and development.

The policy in its guiding principles, assures every person's right to live in a healthy environment. Further it reaffirms sustainable use of natural resources. It also recognizes communities' right to make their own decisions on matters that affect their life and environment.¹⁰⁵ In case there is a need to compromise conflicting interests between environmental protection and economic growth, the policy seems to favor not to cause irreversible damage to the environment.¹⁰⁶ It reads:

When a compromise between short-term economic growth and long-term environmental protection is necessary, then development activities shall minimize degrading and polluting impacts on ecological and life support systems. When working out a compromise, it is better to err on the side of caution to the extent possible as rehabilitating a degraded environment is very expensive, and bringing back a species that has gone extinct is impossible.

As it has been discussed above, Ethiopia is struggling to bring about economic development. And for this endeavor to be meaningful and sustainable, it has to take environmental considerations into development activities. While a number of measures may be taken to ensure this, Environmental Impact Assessment (EIA hereafter) is one of the most important mechanisms to serve this purpose because it enables us to examine the possible impacts of a given course of action on the environment before it is adopted.¹⁰⁷ Moreover, EIA helps decision makers to assess proposed activities, policies, and programs that might cause environmental problems.¹⁰⁸ EIA also helps to bring about administrative transparency, accountability, enhance community

¹⁰⁵ Ibid

¹⁰⁶ See Dejene Girma, *supra* note 88 Concerning the need to balance economic interest and environmental protection.

¹⁰⁷ See Dejene Girma, *Supra* note 92, p.134-159

¹⁰⁸ Mandefro Sorecha, Implementations of EIA Laws in East Shawa Zone of Oromia National State Special Reference to Lume and Ada'aWoreda: Case Study on Various Projects, (2011), (L.L.M. Thesis, Addis Ababa University School of Law Graduate Studies, Human Rights Law Program (NOVEMBER 7, 2011))

participation in development activities that might affect the environment and promote sustainable development.¹⁰⁹ It is important since it reassures sustainable use of natural resources.

The issue of EIA is also indicated in the policy. The policy in this regard requires to ensure not only physical and biological impacts but also to address socio-economic, political, and cultural conditions. In addition, it requires public consultation as an integral part of EIA.¹¹⁰ It also calls for independent review of EIA procedures and public comment before decision is made by the decision makers.¹¹¹

When it comes to the 1995 FDRE Constitution, even though it never used the term EIA, it has recognized that development activities should not hamper the environment and be done to ensure sustainability. For instance, the constitution under Art. 92 (2) provides EIA as a pre-requisite for any policy, programs and projects that might cause environmental harm. It reads: “The design and implementation of programs and projects of development shall not damage or destroy the environment.” It also recognizes the peoples’ right to full participation and expression of views in planning and implementation of environmental policies that might affect them directly.

Besides providing EIA as a pre-requisite in the planning and implementation for any policy, programs and projects that might cause environmental harm, the government has also adopted Environmental Impact Assessment Proclamation No. 299/2002.

In its preambular part, the proclamation provides the reasons behind its enactment. Accordingly, it states that it is to assess and predict environmental impact of a proposed development activity’s design, sitting, construction, operation, ongoing modification or termination of the project. According to the proclamation, prior assessment of possible impacts on the environment provides an effective means of harmonizing and integrating environmental, economic, cultural and social considerations into a decision making process in a manner that promotes sustainable development.

The proclamation imposes the obligation to consider issues of EIA both on the relevant government authority and proponents of projects. The proclamation provides that any project

¹⁰⁹Mulugeta Getu, “The Ethiopian Environmental Regime versus International Standards: Policy, Legal, and Institutional Frameworks”, *1 Haramaya L. Rev.* Vol. 1, No. 1, (2009), p. 43-72.

¹¹⁰ Ibid, see also the 1997 Environmental Policy of Ethiopia

¹¹¹ Ibid

which deserves EIA should not be implemented before preparation of EIA and licensing organs are required to ensure its execution.(see art. 3)

Criminalization of project proponents who make false presentations in EIA study report and proponents who fail to prepare EIA is also provided in the proclamation (See art. 18).¹¹²

Identification of the environmental impact is made by taking into consideration various factors such as size, location, nature, trans-regional effect, duration reversibility or irreversibility of the impact. See art. 4 For instance, implementation of a project a round water bodies may require stringent environmental impact assessment since it might have serious repercussions on water bodies and its resources.

The proclamation also requires EIA study report to be made accessible to the public so that the public will be able to make comments on the study report. The relevant authority is also obliged to incorporate the concerned community's comments in the EIA study report. See art.15

When it comes to the case of Oromia National Regional State, the region where the focus of this study is, established Oromia Environmental Office in 2002 with the responsibility to protect nature and the environment. This Office was re-established with new structure in 2009 as the Oromia Land and Environmental Protection Bureau.¹¹³

As indicated in its preambular part, its establishment is to regulate the implementation of any development activity in accordance with the knowledge of land used planning and environmental protection. The bureau has also the power to formulate policies and strategies pertinent to land environmental protection, ensure their implementation and take legal action in case there is a violation of laws pertinent to land and environmental protection.¹¹⁴ Moreover, the bureau has the power to regulate and follow up that any development body shall conduct environmental impact assessment prior to project implementation; prepare environmental standards and make them available for use: regulate its implementation. Where disposal of pollutants are causing

¹¹² Ibid

¹¹³ A Proclamation to Provide for the Establishment Of Oromia Bureau of Land and Environmental Protection ,Proclamation No. 147/2009, Megeleta Oromia., 19th year, No.5/2009, Art.3

¹¹⁴ Ibid, Art. 5

environmental damage, the bureau has also been accorded the power to take measures to solve the problem.¹¹⁵

In general, even if it has been more than a decade since EIA law was adopted in Ethiopia in general and in Oromia National Regional State in particular, it could be said that the practice is still considered as weak and poorly founded.

2.7. Fishing and Fishery Laws

Fishing serves as a major food item. It also provides cash income which is ultimately used for the purchase of a variety of goods and services. Thus, it significantly contributes to livelihood security. Large numbers of households in Africa rely on fishing both for subsistence and income.¹¹⁶

Ethiopia is also endowed with a number of lakes and rivers which have promising potential for fish stock. This high fish potential could contribute to the country's economy significantly.¹¹⁷ Fishing is also one of the agricultural sectors that has received due attention of the government in both the 1st and 2nd GTP and in the country's Sustainable Development Goals.¹¹⁸

Moreover, the government has also adopted various laws with the view to ensure sustainable utilization and development of the sector. One of such laws is the Fisheries Development and Utilization Proclamation No. 315/2003.¹¹⁹ One of the objectives of the Proclamation is “to conserve fish bio-diversity and its environment as well as to prevent and control over exploitation of the fisheries resources”.¹²⁰ To ensure fish bio-diversity and its environment is

¹¹⁵ Ibid

¹¹⁶ Ignatius Mberengwa and Zelalem Balcha, “The Role of Fishery in Livelihood Security of Fishing Communities around Lake Ziway, Eastern Showa Zone, Oromiya Regional State, Ethiopia”, *JBAS* V.3 N.2 (2011), pp.61-88. Available at: <https://opendocs.ids.ac.uk/opendocs/bitstream/handle/123456789/8829/Ignatius%20Mberengwa%20FINAL.pdf?sequence=1&isAllowed=y> (last Accessed on 11 Jan, 2019)

pp.61-68

¹¹⁷ Felegeselam Yohannes (2013), *Management of Lake Ziway Fisheries in Ethiopia* (M.Sc Thesis, University of Tromso Department of Economics Norwegian College of Fishery Science, Graduate Studies, Masters of Science in International Fisheries Management (May 2013, Norway), p.12.

¹¹⁸ The Federal Democratic Republic of Ethiopia National Plan Commission, Voluntary National Reviews on SDGs of Ethiopia: Government Commitments, National Ownership and June 201 Addis Ababa p.35

¹¹⁹ Fisheries Development and Utilization Proclamation, Proclamation No. 315/2003, Neg. Gaz., 9th year, No.32

¹²⁰ Id, Art.3

protected, the Proclamation obliges concerned organs of the Federal and Regional governments to ascertain that development projects around water resources will not have direct or indirect negative impact on fisheries resources.¹²¹ Moreover, the proclamation also provides controlling mechanisms in order to ensure sustainable fish production and utilization. For instance, the proclamation prohibits all sorts of fishing (commercial, recreation and subsistence) without securing permit from relevant authority. Thus, fishing is open only to those persons who have secured license from the concerned government organ. It also puts restriction on the methods and types of fishing materials. For instance, fishing by poisoning, narcotizing, explosives...is prohibited.¹²²

The Proclamation also gives power to the “fishery inspector”, a person duly authorized by the Ministry of Agriculture or concerned regional authority to ensure the implementation of the proclamation, regulation or directives.¹²³ The fishery inspector is given the power to control the legal status of fishermen, methods and materials used to catch fish.... Finally, the proclamation also provides penalty on those who violate provisions of the proclamation.

Likewise, the Oromia National Regional State has also enacted a Proclamation to Determine Fishery Resource and Development, Preservation and Utilization in the Oromia Region.¹²⁴ One of the objectives of the Proclamation is to conserve fishery resource and its ecosystem and prevent and supervise over exploitation. Likewise Proclamation No. 315/2003, no person is allowed to engage in fishing activity, whether it is for commercial, recreation or subsistence without securing permit from Oromia Livestock Resource Development and Health Agency or relevant structural organs established to ensure its implementation.¹²⁵ Similar to the Proclamation No. 315/2003, the Oromia Fishery Resource and Development, Preservation and Utilization Proclamation gives similar power to “fishery inspector”.¹²⁶ It also provides penalty on those who violate the Proclamation. Unlike the Proclamation No. 315/2003, however, the Oromia Fishery Resource and Development, Preservation and Utilization Proclamation establishes fishery

¹²¹ Id, Art.8

¹²² Id, Art.5

¹²³ Id, Art. 2(17) and Art. 13

¹²⁴ Proclamation to Determine Fishery Resource and Development, Preservation and Utilization in the Oromia National Regional State, Proclamation No. 178/2013, Megeleta Oromia., 21th year, No.4

¹²⁵ see also Art.5 Proclamation No. 315/2003, supra note 151, See Proclamation No. 178/2013, supra note 156, Art. 6

¹²⁶ See Art. 13 and 14 Proclamation No. 178/2013, supra note 124.

inspection committee at different district levels.¹²⁷ This committee is accorded with the power to pass decision on illegal fish breeding and production activities. The committee based on the report submitted to it by the fishery inspector, it may take measures on illegally caught fish, fishing gears and boats.¹²⁸

2.8. Regulation of Pesticide and Fertilizer Use in Ethiopian

Pesticides were considered a safe and effective way to control pests and diseases. In Ethiopia pesticides in the agricultural sector were introduced in the 1960s. Since the country's economy is dependent on agriculture, the use of pesticide has increased rapidly for crop production.¹²⁹ However, currently, pesticide usage by small holder farmers is frequently misused (abuse and overuse). Farmers' pesticide usage is poisoning and causing health effect on the users and the environment. Moreover, pesticide residue is found in food and drinking water.¹³⁰ Ethiopia is also considered as having the largest stockpile of obsolete pesticide in Africa.¹³¹

In Ethiopia the power to regulate and implement and monitor pesticide policies, pesticide registration, importation, distribution and use are given to the Ministry of Agriculture and to agricultural bureaus of regional states.

Policy plays a vital role in the implementation of any regulatory framework. In this regard considering the overall issues associated with pesticide, the government of Ethiopia has formulated pesticide legislation (Pesticide Registration and Control Proclamation No.674/2010) to govern pesticide use by farmers. As noted by Mengistie¹³² policy alone cannot accomplish the issues associated with pesticide (registration, manufacturing, distribution, use, monitoring quality control, waste management, improving the environment, health of growers and the surrounding community) unless it is enforceable. The enforcement of realistic pesticide policy is the most important component to address pesticide problems.¹³³ According to Mengistie, although there is

¹²⁷ Id, Art. 12

¹²⁸ Id, Art. 12 See Art. 12

¹²⁹ Mengistie BT "Policy-Practice Nexus: Pesticide, Regulation, Distribution and Use in Ethiopia", SM J Environ Toxicol of Environmental Toxicology 2016; 2(1) 1006, p.1.

¹³⁰ Ibid

¹³¹ Ibid

¹³² Ibid

¹³³ Ibid

legislation governing pesticide, it has not been enforced effectively at the federal, regional and grass root or district level.¹³⁴

In Ethiopia the first pesticide regulation was a single article included in the Plant Quarantine Decree No.56 of the 1971. In 1990 another decree was also enacted to provide for the registration and control of pesticides. As per this decree, the manufacturing, importation and sale or use of unregistered pesticides was prohibited. The decree has also some missing points. For instance, lack of definition of relevant technical terms, lack of scope and provisions on operation of the advisory committee, pesticide register, and temporary prohibition, transport of pesticides, little powers to inspectors, lack of penal sanctions for defaulters to combat the illegal trade of pesticides in retail shops and in the open market.¹³⁵ Pesticide Registration and Control Proclamation was enacted in 2010.¹³⁶ The proclamation was enacted to fill the gaps seen in the previous pesticide related laws.

One of the purposes of the proclamation is to lay down scheme of control which would minimize the adverse effects that pesticides use might cause to human beings, animals, plants and the environment.¹³⁷ Moreover, regulating the manufacturing, formulation, import, export, transport, storage, distribution, sale, use and disposal of pesticides and other related matters is also another objective of the proclamation.¹³⁸

The Proclamation is not free from challenges. According to Mengistie, one of the major challenges in the governance of pesticides is lack of appropriate registration system. According to him very little attention is given to the system of evaluating the detailed data on physical and chemical properties, toxicology, efficacy, residues, environmental effects and proposed use on crop and/or pest.¹³⁹ There is a need for a detailed risk assessment prior to registration of pesticides at federal level. However, according to him the registration office currently lacks this. Pesticide dossier evaluation and registration is affected by lack of available staffing, knowledge and resources. For instance, the experts may have the theoretical knowledge, however, pesticide registration is not supported by laboratory test (experimental details of its efficacy and

¹³⁴ Ibid

¹³⁵ Id, p.3

¹³⁶ Pesticide Registration and Control Proclamation No. 674/2010¹³⁶, Neg. Gaz., 16th year, No.52/2010

¹³⁷ Ibid, See preambular part para.2.

¹³⁸ Ibid, para,3.

¹³⁹ Mengistie BT, supra note 129, p.4.

safety) and research works have not been done on toxic chemical pesticides.¹⁴⁰ Thus office of the pesticide registration is dependent on certification of foreign manufacturers and it is not adequately equipped to verify the claims.

The other challenge is absence of systematic monitoring and surveillance of the effects of pesticides on the environment and human health. The regulatory body has no information regarding the products once registered. Registered pesticides are not checked while they are in circulation to assess whether their quality is in accordance with the requirements of the standards. For instance, flower farms import unregistered pesticides. Registered pesticides also could be subject to abuse and misuse. Thus registration by itself cannot guarantee safety. For instance, the study conducted in most surface water samples taken from the agricultural areas of Ziway and Meki contain residues of pesticides. The concentrations of these pesticides occasionally exceeded the European and Dutch standard for drinking water.¹⁴¹

Lack of quality control laboratory for pesticide analysis is also another challenge. There is inspection system team at Kaliti and Bole Airport to manage the quality of registered pesticides. However, absence of laboratory to take samples of the product to test its quality makes the inspection process very difficult. The Ministry of Agriculture does not have laboratory for analysis to determine the quality of the pesticides supplied by registrants. The only inspection is label and ingredients of pesticides are not subject to analysis. For instance, one chemical can have multiple trade names. However, without laboratory analysis, it is very difficult to identify and control fake and sub-standard products in the country. Lack of coordination between custom office and Ministry of Agriculture is another challenge. In this respect absence of specific custom regulations governing the procedure for pesticide imports is a challenge. For instance, some custom offices allow releasing pesticide without being inspected by pesticide inspectors from Ministry of Agriculture, or from the ports of Kaliti or Bole¹⁴². Lack of professionalism on the part of the pesticide retailers is also against the purpose of Pesticide Registration and Control Proclamation No. 674/2010, which aims at ensuring that end users are provided with competent advice on risk minimization and proper use of pesticides.¹⁴³

¹⁴⁰ Ibid

¹⁴¹ Id, p.5.

¹⁴² Id, p.6.

¹⁴³ Id, p.9.

Concerning fertilizer, though Ethiopia's economy is dependent on agriculture, performance of the agricultural sector is poor. Therefore, to improve the poor performance of the agricultural sector and feed the growing population, the government is encouraging farmers to use fertilizers.¹⁴⁴

To govern the growing fertilizer use, import, production, distribution, registration and quality control, Ethiopia has enacted Fertilizer Manufacturing and Trade Proclamation No.137/1998. The proclamation provides detailed registration requirements, conditions for suspension or cancellation of certificates in case of breach of law such as in case of sale of adulterated fertilizers. The obligation to enforce the proclamation is accorded to Ministry of Agriculture and structures within the Ministry. However, the governance of fertilizer in general suffers from lack of fertilizer policy, proliferation of national institutions regulating fertilizer, lack of capacity, inadequate facilities for testing and analysis of fertilizers.¹⁴⁵

The gaps in the implementation of fertilizer use, importation, quality control, use...contribute towards the damage of the environment. As noted by Yared one of the reasons for the decline of water birds and fish in Lake Ziway is the use of fertilizers by the small and large scale irrigation practices around the shore of the lake.¹⁴⁶

In general, the degradation of Lake Ziway as the result of agro-chemical use, depletion of water quantity, siltation...,and their impact on fishing has significant economic, social and other implications. Thus, to assess the impact of degradation of Lake Ziway on the livelihoods of the fishermen, the researcher will use various tools to gather data surrounding the environmental problems on Lake Ziway. Accordingly, the researcher employs various methods to identify the causes of environmental problems surrounding Lake Ziway and their impact on fish production and fishermen who rely on the lake's fish resources as their livelihood. To gather all the relevant issues in relation to the theme of this research paper, the researcher will conduct interviews with fishermen, pertinent bodies, such as, Oromia Agricultural Research Institute Batu Fishery and other Aquatic Life Research Center, FDRE Rift Valley Lakes basin Authority Batu/Ziway

¹⁴⁴ Franklin Simtowe, (2015), Support for the Establishment of a Regional Fertilizer Policy and Regulatory Framework in East and Southern Africa An Assessment of National Fertilizer Policies, Regulations and Standards for Ethiopia, African Fertilizer and Agribusiness Partnership, conference paper, p.12

¹⁴⁵ Ibid

¹⁴⁶ Yared Beyene, supra note 32, p.72.

Branch office, irrigation farms...etc, farm visits and personal observation also will be employed. Moreover, secondary sources, such as, literature sources, review of journals, data, articles, books and published and unpublished materials will be examined. Details of the methodology employed will be discussed in the next chapter.

Part Two

Empirical Review on Lake Ziway Area

2.9. Environmental Issues Surrounding Lake Ziway

Significant portions of the earth's land and water resources are under increasing global pressure. These resources are some of the most critical assets needed to support the livelihoods and socio-economic development of human society. Currently, however, fresh water resources are among the scarcest resources in some parts of the world.¹⁴⁷ This is attributed to rapid population growth, fast economic development and mis-management of the resources.¹⁴⁸

Ethiopia has a number of lakes and rivers with substantial quantity of fish stocks.¹⁴⁹ The country has also many artificial water bodies which have been stocked with fish for fishery.¹⁵⁰ Most of these lakes are found in the Ethiopian Rift Valley System, which is part of the Great East African Rift Valley System.¹⁵¹

Lake Ziway is the one of the largest fresh water lakes in the Ethiopian Rift Valley system. The lake and its watershed play significant role in supporting the livelihoods of approximately 2 million peoples and 1.9 million livestock that inhabit it.¹⁵² It is used for various uses such as irrigation, fishing, domestic water supply, transportation, recreation, indoor flower farming and for various other purposes.¹⁵³

¹⁴⁷ Ibid

¹⁴⁸ Ibid

¹⁴⁹ Abera L, Getahun A, Lemma B, "Changes in Fish Diversity and Fisheries in Ziway-Shala Basin: The Case of Lake Ziway, Ethiopia." Journal of Fisheries and Livestock Production Vol. 6 (2018), p.1-7.

¹⁵⁰ Ibid

¹⁵¹ Ibid

¹⁵² H. Desta et.al, supra note 36.

¹⁵³ Ibid

For domestic and livestock alone, 7-8 million m³ water is abstracted from the lake each year. The lake has also been used for long as a single drinking water supply for the residents of Ziway town by the municipality.¹⁵⁴

The lake is also a major source of water supply for open and closed farm irrigation activities situated along the shoreline of the lake. Thousands of hectares of land is cultivated along the shoreline. For instance, many youth from nearby towns and villages, such as, Ziway, Bochesa, Adami Tullu, Kontola, Abosa...ect are engaged in irrigation activities using the lake as a source of water. These youngsters produce vegetables, such as onion, cabbage, tomatoes, beans...etc and sell their produce to the nearby towns and markets including the capital city.¹⁵⁵

There are also other large scale industries such as Share Ethiopia, the largest flower farm in Ethiopia, Castel Winery, Ziway Federal Prison and others, engaged in various agricultural activities using the lake as their water source.¹⁵⁶

Lake Ziway is also a source of fish supply for huge market centers in Ethiopia. The Fish yield potential of the lake is estimated to be from 3000-6680 tons per year.¹⁵⁷ The fish production of the lake has been the second largest from the Rift Valley lakes, which accounted for 3180 tons, next to Lake Chamo, that produced 4500 tons.¹⁵⁸

A large number of cooperatives and individuals depend on the lake's fishery for their livelihoods. Women and children also participate in processing and selling fish.¹⁵⁹

Fishing has both a direct and indirect contribution to household or can serve as a source of income to purchase food. Moreover, remuneration from fishing helps education of the household, increase fishermen's participation in social events such as edir, ekub etc, and income

¹⁵⁴ Ibid

¹⁵⁵ Personal observation of the researcher. As the researcher lived in Ziway town since 1983, he has firsthand knowledge of the activities around Lake Ziway and the surrounding villages and towns, such as, Adami Tulu, Abosa, Kontola, Bochesa, Hizbawinuro...etc

¹⁵⁶ Personal observation

¹⁵⁷ H. Desta et.al, supra note 36.

¹⁵⁸ Fish production of the lake is even higher than that of Lake Tana, which is the largest lake in the country. See Mitike Assefa. "Fish Production, Consumption and Management in Ethiopia", *International Journal of Economics and Manage.* Vol. 3.(2014), p.1-6. Available at: <https://www.omicsonline.org/open-access/fish-production-consumption-and-management-in-ethiopia-2162-6359.1000183.php?aid=33618> (last accessed on 11 Jan, 2019)

¹⁵⁹ Personal observation

from fishing helps for the development of the financial capital of the fishermen through saving.¹⁶⁰

Besides the lakes economic and livelihood values, the lake and its watershed support unique ecological and hydrological characteristics.¹⁶¹

Currently, however, the lake is exposed to various human pressures due to intensification of development activities in the watershed. Because of anthropogenic factors, such as, changes in land use and handling of agro-chemicals in the watershed, Lake Ziway is facing huge environmental concerns.¹⁶² These include:

a) **Water quality:** The water quality of Lake Ziway is being highly affected by the floriculture industries and horticulture activities located at the shore of the Lake. Some of the flower farms discharge chemical effluents directly into the Lake. The levels of certain chemicals in the lake were found beyond the levels of WHO, FAO and USA-EPA water quality guidelines.¹⁶³ Because of the effluents discharged into the lake, it is deemed unsuitable for use as a raw public water supply, irrigation, maintenance of fisheries and aquatic life.¹⁶⁴ For instance, Lake Ziway used to serve as Ziway town's water supply until mid-Jan, 2018. However, since Jan 2018, drinking water for Ziway's town is supplied from Sedeseden town located 50 km South of Ziway. A 300 million birr clean water supply was finalized and it became operational in Jan 2018. Before the Sedeseden clean water supply became operational, residents of Ziway town used to buy 20 liters of water from Bulbula town for 15 birr since Ziway town's water supply was not clean and healthy.¹⁶⁵ There was also a media report that the town's water was a cause for various diseases such as typhoid, typhus and gastric problems.

¹⁶⁰ Ignatius Mberengwa and Zelalem Balcha, supra note 116.

¹⁶¹ H. Desta et.al, supra note 36.

¹⁶² Ibid

¹⁶³ Ibid

¹⁶⁴ Hengsdijk, and Jansen, supra note 24, p.3

¹⁶⁵ The Researcher grew up in Ziway and he has family living in the town. Therefore, he has firsthand knowledge of the fact as he is now temporarily residing there.

- b) **Health Concerns:** there are around 120 chemicals that enter Ethiopia for the floriculture industries which are found on the WHO negative pesticide list, and some of these chemicals are being used by floriculture industries located at the shore of Lake Ziway.¹⁶⁶

Effluents from the flower farms and pesticides from horticulture activities at the shore of the lake can migrate via water into the food chain as well, ultimately being consumed by humans/ animals in food.¹⁶⁷ It is evident that most of the total intake of pesticide residues by human beings is through the food chain. Fish are known to bio-magnify pesticides from the surrounding environment, and transfer the pesticides to humans when consumed.

For instance, a study conducted in some of the rift valley lakes including Lake Ziway, shows that the levels of mercury in certain types of fish were found higher than the threshold value indicating that daily exposure to these compounds was a potential lifetime cancer risk for people- who consume those fishes.¹⁶⁸ In some types of fishes even if the level of mercury found was below the threshold of WHO guideline, it could still cause health risks for those people- who consume such types of fish daily. Moreover, the chemicals used for horticulture activities may be washed and enter into the lake and through the food chain they could be consumed by humans and this could influence the concentration of thyroid hormones and it could cause neurodevelopment delays during early childhood due to impacts of pre-natal exposure to DDT.¹⁶⁹ Moreover, the agro-chemical, famously known for killing fish and bees in also found in fish bodies. These synthetic and inorganic fertilizers, pesticides and other chemicals and their resultant environmental crisis do not only have impact on the fish resources, they also undercut food producing resources and threaten our health.¹⁷⁰

- c) **Fish Mortality:** effluents discharged into the lake from floriculture industries at the shore and fertilizers and pesticides from horticulture activities surrounding the lake may in part be

¹⁶⁶Malefia, Supra note 20, p.25.

¹⁶⁷Id, p.3

¹⁶⁸Ermias Deribe, et.al, “Level of Mercury in Fish From the Ethiopian Rift Valley Lakes: Its implications in Dietary Exposure”, (2014), *Ethiopian Journal of Biological Science*, Vol. 13(1), (2014), p.25-35.

¹⁶⁹Yared Beyene, supra note 32, p.51, 52

¹⁷⁰Gebremedhin Birega, “State of the Right to Food, Food Sovereignty and Food Democracy: Challenges and Opportunities to Promote Democracy and Good Governance in Ethiopia”, in *Ensuring Fundamental Rights: The Right to Food, Freedom of Expression, Access to Information and Reproductive Health* (2015), Debebe Hailegebriel, (ed.), p.5

returned to the water system and cause fish kill.¹⁷¹ For instance, in 2003 E.C., there was mass mortality of fish as the result of the effluent discharged into the lake by Sher Ethiopia, one of the flower farms located at the shore. It was after this incident that Sher Ethiopia begun artificial wetland treatment in order to treat the effluent before it was released into the lake. However, since the entire flower farms at the shore of the lake do not have artificial wetland treatment mechanism; there is still mortality of fishes, though mass mortality has not been recorded similar to the 2003 incident.¹⁷² An expert at Oromia Agricultural Research Institute Batu Fishery and other Aquatic Life Research Center also told the researcher that EBC and OBN reported that Ziway fish was inedible since the fish from Ziway Lake were chemically contaminated. The local fish commonly known as koroso was the most cherished fish and preferable one among the local consumers and it was also transported to other markets, including Addis Ababa.¹⁷³ However, after the EBC and OBN report consumers, have less preference to Ziway fish. Therefore, fish mortality directly affects the livelihood and food security¹⁷⁴ of fishermen who entirely rely on fishing to support themselves.

- d) **Water Depletion:** The principal sources of Lake Ziway, Meki River and Ketar River used to have substantial base flows into Lake Ziway.¹⁷⁵ However, the incoming water flow from these rivers has substantially reduced as the result of uncontrolled water abstractions for small scale irrigation schemes in the upper streams. This has critically impacted the level of Lake Ziway.¹⁷⁶ Expansion of irrigation area at the shore of Lake Ziway would also result in a 3 m reduction in level of the Lake.¹⁷⁷

¹⁷¹ Petra Spliethoff, et.al., supra note 21, p.3.

¹⁷² With the view to obtain baseline information about fishing activities and Impacts of Pesticides, and fertilizers on fish resources of Lake Ziway, the researcher had a discussion on Feb 10, 2018, 3:00 am, with Ato Alemu, a researcher at Oromia Agricultural Research Institute Batu Fishery and other Aquatic Life Research Center, and mass mortality of fish was to the researcher by the expert.

¹⁷³ Zerihun Doda (2008) "Crisis in fishing livelihood & ethno-ichthyological traditions in Ethiopia: the case of Zay of Lake Zway islands", (The Christensen Fund Grant) Report January 2008, HAWASSA UNIVERSITY CENTER FOR ENVIRONMENT AND SOCIETY, p.20

¹⁷⁴ Gebremedhin, Supra note 170, p. 10-Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preference for an active and healthy life so the notion of food security is concerned primarily with people having food on their table and not going to bed hungry. p.10

¹⁷⁵ Hengsdijk, H. and Jansen, H. supra note 24, p.13.

¹⁷⁶ Ibid

¹⁷⁷ Petra et.al., Supra note 21, p.7.

A study was also conducted on the climate change impact on the Lake water level and water surface area. This study estimates that within the next three decades, the reduction in the water level of the lake could become imminent and the Lake might shrink up to 25km².¹⁷⁸ When this is combined with the current unsustainable water extraction, with the millions of cubic meters of water lost through evaporation, and reduction in the inflow to the lake, and shortage of rainfall because of climate change, and the recent problem of hyacinth, the problem might even be worse. Thus, unless measures are taken, there is no doubt that Lake Ziway may encounter the fate of Lake Haramaya.¹⁷⁹

The reduction in water level of the lake through high water abstraction could have many negative impacts. Firstly, it leads to reduction in fish production. The decline in the lake volume damages the breeding and nursery grounds of fish species that spawn in littoral vegetation of the lake, particularly, *O. Niloticus* (locally known as Koroso), which is commercially the most important fish species.¹⁸⁰ This is because higher fish production is associated with suitable water level of the lake.¹⁸¹ This in turn affects the livelihood of the fishermen.

Secondly, reduction in the water level of the Lake Ziway because of uncontrolled abstraction of water from the lake, less inflow of water to the lake, evaporation, may lead the lake to become terminal lake. This eventually leads the lake to become saline like Abijata.¹⁸² According to Jansen, given the relatively shallow depth of Lake Ziway, critical level of salinity could be reached within 5-10 years.¹⁸³ If this critical level of salinity is reached, it will affect the lives of

¹⁷⁸Lijalem-Zeray Abraham, et.al. (2007) "Climate Change Impact on Lake Ziway Watershed Water Availability, Ethiopia", available at: <http://www.uni-siegen.de/zew/publikationen/volume0607/zeray.pdf>

¹⁷⁹Lake Haramaya was one of the Lakes in the East Harerge Zone of Ethiopia. The Lake used to serve as drinking water supply, irrigation, animal watering and for various other purposes. However, the Lake completely died around 2005 due to negative water balance i.e. It was over exploited. Currently, however, due to conservation activities the Lake is reappearing. See Seifemichael Abebe et.al., "Impact of Disappearance of Lake Haramaya on the Livelihood of the Surrounding Community: The Case of Haramaya District in Oromia National Regional State, Ethiopia", Journal of Economics and Sustainable Development, Vol.5, No.18, (2014), Available at: http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0ahUKEwiuvbbPuInaAhWFCuwKHV9iAMQFggtMAE&url=http%3A%2F%2Fwww.iiste.org%2FJournals%2Findex.php%2FJEDS%2Farticle%2Fdownload%2F16041%2F16423&usq=AOvVaw2Vinybn0ilcWaWYap8A0_1 (Accessed on March 23, 2018)

¹⁸⁰Lemma Abera, Current Status and Trends of Fisheries and Fishery of a Shallow Rift Valley lake, Lake Ziway, Ethiopia, (2016), (Phd Thesis, Addis Ababa University Department of Zoological Sciences School of Graduate Studies, Fisheries and Aquatic Science (June 2016, Addis Ababa). p.33

¹⁸¹H. Desta et.al, supra note 36

¹⁸²Jansen H., Hengsdijk H., Dagnachew Legesse, Tenalem Ayenew, Hellegers, P. and Spliethoff P. (2007). Land and water resources assessment in Ethiopian Central Rift Valley. Alterra Rapport 1587, Available at: <http://edepot.wur.nl/19397>, p.33.

¹⁸³Id, p.12

millions of peoples who rely on the lake for various purposes such as domestic water supply, irrigation, and livestock watering.¹⁸⁴In general, the socio-economic and other benefits of Lake Ziway are very high. However, the Lake is facing degradation due to the reasons stated above. And the Lake's degradation has immense implication on the lives and livelihoods of fishermen who rely on the Lake's fishery to fulfill their needs. For instance, Lake Ziway has a fishery potential of more than 6000 tons per year. However, currently the actual exploitation of fish production has declined from 3180 tons in 1997 to 1157.14 tons in 2014¹⁸⁵. This is attributed to several reasons. The major reason is anthropogenic activities around the shore of the lake such as, irrigation close to shores or littoral zone, deforestation of the watershed, waste discharged into the lake, poor watershed management etc. In Agumase's findings Ziway Lake's fish stock is depleting from time to time. And according to him the possible challenges are water volume reduction due to abstraction of water for irrigation and water supply, siltation, chemical pollution due to runoff from irrigated lands, uncontrolled and excess fishing practice, increasing fishing population, use of small-mess nets, and lack of community involvement and sense of ownership of the lake.¹⁸⁶ In general, even if the lake has huge potential for fishery, this potential is dependent on the above stated anthropogenic problems observed on the lake.

¹⁸⁴ Ibid

¹⁸⁵ Lemma Abera, supra note 143, p.ii

¹⁸⁶ Agumase Tesfahun, "Water Quality Problems Related to Challenges and Their Impacts on Ethiopian Fishery." *African Journal of Environmental Science and Technology*, Vol.13(2), February 2019, pp.66-73.

Chapter Three

Methods and Methodology

Considerable numbers of researches have been done on Lake Ziway. However, most of these researches focus on biological aspect of fish, management of fish, water quality of Lake Ziway, watershed management, water level...etc.¹⁸⁷ There is no research that focuses on the environmental problems of Lake Ziway and their impact on fish production and the livelihood of fishermen in light of applicable laws. Thus, this research aims at investigating the causes of environmental problems, the impact of existing environmental problems on fish production and their ultimate effect on the livelihood rights of fishermen.

Study Area

Lake Ziway is found in Oromia National Regional State. It is located at 160 km south of the capital- Addis Ababa. The lake extends over an area of approximately 434 km² and has a maximum of 9 m and an average depth of 2.5 m with a shoreline length of 137 km.¹⁸⁸ It is the most upstream of the Central Rift Valley lakes of Ethiopia. The Lake is bordered by two administrative Zones of Oromia National Regional State. The West part belongs to East Shoa Zone and the Eastern part belongs to Arsi Zone. The West shore is shared by two districts (Woredas), namely, Adami Tullu Jido Kombolcha (A.T.J Kombolcha) and Dugda. And the Eastern shore belongs to Ziway Dugda district.¹⁸⁹

Selection of Site

Landing sites are places at the shore of Lake Ziway which are used by fishermen to land their fish catches. The three districts surrounding Lake Ziway i.e A.T.J. Kombolcha, Dugda and Ziway Dugda have their own landing sites of different sizes¹⁹⁰.

Though there are several small landing sites in the above districts through which a few fishermen bring out their catches, most fishermen use the bigger landing sites to bring their catches.

¹⁸⁷Lemma Abera , supra note, 180, p.14.

¹⁸⁸Hengsdijk, H. and Jansen, H. supra note, 24.

¹⁸⁹Lemma Abera, supra note 180, p.24.

¹⁹⁰Id, p.135

Since the aim of this research is to investigate the impact of environmental problems of Lake Ziway on fishermen of Ziway town, A.T.J. Kombolcha district has been chosen as a site. A.T.J. Kombolcha district has six landing sites known as Kontola, Korokonch, Menafesha, Shallo, Woranto, and Wafiko.

Wafiko is the largest landing site and most of the fishermen bring their catch to Wafiko landing site since the town's administration has built there a kind of "fish slaughterhouse", where fishermen process their fish. Moreover, fish traders and local consumers also come to this site to buy fish.

Therefore, since most of the fishermen use bigger landing sites, Wafiko, Korekonch, and Menafesha (Cafeteria) landing sites, have been chosen by the researcher purposefully to gather survey questionnaire.

Sample Selection

Fishermen around Lake Ziway have been organized into fishermen cooperatives in line with government policy. Each of the fishermen cooperatives are obliged to pay in return for the privilege of exploiting the fish resources. In the site selected for this research, there are five cooperatives known as Ziway Batu, Kontola, Bochessa, Abeyi Burkitu, Abosa with a total of 167 members.¹⁹¹

This research is based on both primary and secondary data. For primary data, the target population of the study are fishing communities in Ziway town. The subjects of the study have been selected from three landing sites of fishery cooperatives found in A.T.J. Kombolcha.

From the total of 167 members, 20 respondents who are engaged in catching fish have been chosen purposefully from the Wafiko, Korekonch, and Menafesha (Cafeteria) landing sites.

Primary data has been collected using semi-structured questionnaire and interviews, informant interviews and personal observations. The interview questions were prepared to solicit information about environmental problems around Lake Ziway, what the town's administration is doing to solve the environmental degradation of Lake Ziway, impact of Ziway's Lake degradation on the livelihood of fishermen.... Moreover, alternative livelihood source of the

¹⁹¹ Ibid

fishermen, challenges faced by the fishing communities in the attainment of their livelihood sources, and the solutions to the existing environmental problems have also been examined.

Key informant interview has also been held with elder who have years of experience in fishing and activities of the study area. The interviews with key informant interviewee focused on fish resources of Lake Ziway, environmental challenges and their impact on fish production, benefits of fishing to the fishermen, the society and the local community in general, and the challenges faced by the fishermen in general.

Moreover, interview was conducted with researchers form Oromia Agricultural Research Institute Batu Fishery and other Aquatic Life Research Centers. The interview with the researchers focused on impacts of the chemical effluents released into the lake, siltation, excessive water abstraction... on fish reproduction and production.

Interview was also conducted with Rift Valley Lakes Basin Authority concerning the reasons for the reduction of water level of Lake Ziway and what the authority is doing to solve the problem.

Focus group discussion has also been conducted with six fishermen. The discussion focused on the overall environmental problems surrounding Lake Ziway and their impact on the fish resources and the possible solutions.

Personal observation of the researcher was also important in the investigation of the environmental degradation of Lake Ziway and its resulting impact on fish production and its ultimate impact on the lives of the fishermen. As the researcher grew up in the study area in particular place known as Gultit, which has long been used as fish market, this life experience of the fishing activity and familiarity with the fishermen will facilitate the collection of reliable information. Finally, the data collected will be qualitatively analyzed.

Chapter Four

Analysis of the Findings

4.1. General Background

Ethiopia has large number of lakes and rivers. These water bodies have huge potential for agriculture and aquaculture developments and solve the country's recurrent problem of famine and starvation and contribute to the country's economy.¹⁹² Among these water bodies, the Rift Valley Region is well known for its many fresh water resources which have huge potential for various development projects.

Lake Ziway is also one of the fresh water resources found in the Rift Valley Region, in East Shoa Zone of Oromia National Regional State. The Lake is widely being used for various uses, such as large scale and small scale irrigation, animal watering, bathing, domestic water use, fishery and eco-tourism.¹⁹³

Lake Ziway has also huge potential for future agriculture aquaculture and other development projects. The existence of the lake itself serves as a huge water resource for various development projects. Moreover, there are a number of factors attributed to the suitability of the area for different investment activities, such as availability of land for investment, suitable climatic conditions, availability of cheap and abundant labor, and proximity to the capital.

Hence, due to the suitable factors mentioned above, the watershed area of Lake Ziway is extensively used for various small scale and large scale irrigation activities. For instance, Sher Ethiopia, the largest floriculture industry in Ethiopia and Castel Winery are among the large scale industries that are found around the watershed. There are also thousands of youngsters engaged in irrigation activities around the shore of the lake.¹⁹⁴

While these large scale and small scale development projects around the watershed are becoming huge job opportunities for a number of unemployed youth, they are also creating huge

¹⁹² Federal Democratic Republic of Ethiopia, Country Strategic Paper 2011-2015 April 2011 Africa Development Bank Group p.10

¹⁹³ Malefia, supra note, 20, p.1.

¹⁹⁴ Ibid

environmental concern.¹⁹⁵ For instance, effluents from these large scale and small scale irrigation activities enter into the lake in various ways. The effluents that enter into the lake have huge adverse consequence on the right to clean and healthy environment of individuals and on the right to livelihood of the fishermen.

Firstly, the chemical effluents released into the Lake Ziway or effluents that enter into the lake through run off enter into our body through food chain. These effluents could influence the concentration of thyroid hormones and it could cause neurodevelopment delays during early childhood due to impacts of pre-natal exposure to DDT.¹⁹⁶ For instance, fish are known to bio-magnify pesticides from the surrounding environment, and transfer the pesticides to humans when consumed. The levels of mercury in certain types of fish were also found higher than the threshold value indicating that daily exposure to these compounds was a potential lifetime cancer risk for people who consume those fishes.¹⁹⁷ Moreover, mercury has the effect of muscle contraction, numbness, impaired vision, insanity, birth defect and death.

Besides the health concern that may happen through the process of food chain, the health concern also occurs when contaminated water of the lake is put to human consumption. As it has already been seen under chapter two, there are millions of peoples who use Lake Ziway for domestic purposes. Thus, domestic use of the lake could cause different health concerns such as typhoid, typhus and gastric problems. Moreover, animals that drink the lake's water could also be exposed to various health problems.¹⁹⁸

Secondly, the effluents from the large scale and small scale irrigation practices cause fish kill.¹⁹⁹ As discussed in chapter one, there was an incident in 2003 E.C that resulted in mass fish mortality because of the effluent released by Sher Ethiopia. Even though, such incident has never re-occurred with such magnitude, there is still considerable frequency of fish mortality with a lesser magnitude.²⁰⁰ This affects fish reproduction and ultimately results in less fish production

¹⁹⁵ Ibid

¹⁹⁶ Yared Beyene, supra note 32, p.51, 52.

¹⁹⁷ Ermias Deribe, et.al, supra note 131, p.29,30

¹⁹⁸ For instance, in the focus group discussion one of the fishermen told the researcher that 7 of his cattle died as the result of drinking the lake's water.

¹⁹⁹ Petra Spliethoff, et.al., supra note 21 p.3.

²⁰⁰ During the interview with Mathewos Hailu, researcher at Oromia Agricultural Research Institute Batu Fishery and other Aquatic Life Research Center, interview held on 26/11/2018, in his office at 4:30 am, he told the

which in turn affects a number of fishermen who rely on the lakes fish resources as their means of livelihood.

Besides erosion from the nearby small scale irrigation, disposal of waste into ditches and feeder rivers, cutting grass from the lake...have also impact on fish reproduction and ultimately affect fish production and livelihood of fishermen. Moreover, the recent problem of hyacinth could have also a major impact in the future.

To reduce the impact of such development activities on human environment and their ultimate effect on individuals' right to clean and healthy environment and the right to livelihood, Ethiopia should comply with its international, regional and national commitments.

Although Ethiopia has taken legislative measures at national, regional and international level, non-compliance with its obligation has resulted in the violation of a wide range of human rights in the study area.

Thus, this chapter attempts to examine the environmental challenges of the development activities in Ziway town on Constitutional right to clean and healthy environment with particular emphasis on the right to livelihood of fishermen. Moreover, analysis of findings of the survey questionnaire, interview and focus group discussion have also been made.

4.2. Factors Responsible for the Decline of Lake Ziway Water Level

As it has been evaluated in the foregoing chapters, fish production is associated with good water level.²⁰¹ Lower water level dries up the breeding and nursery grounds resulting in less fish reproduction. Hence, interview was conducted with officials at the Rift Valley Lakes Basin Authority (herein after authority) to assess the factors responsible for the reduction of the water level of Lake Ziway and what is being done to restore the water level of the lake.

The Rift Valley Lakes Basin Authority was established as an autonomous federal government organ with its own personality by the Rift Valley Lakes Basin High Council and Authority

researcher that there are still frequent incidents of mass mortality of fish though they are of lesser magnitude than the 2003 E.C incident.

²⁰¹ Lemma Abera supra note, 180, p.127.

Establishment Council of Ministers Regulation No.253/2011.²⁰² Its overall objectives are to promote and monitor the implementation of integrated water resources management process in an equitable and participatory manner in the Rift Valley Lakes Basin.²⁰³ The authority has its head office in Hawassa. It has also branch office at Ziway.²⁰⁴

The authority has the power and duty Initiate and submit to the High Council policy measures needed to create a conducive environment for the implementation of an integrated water resource management process within the basin; and follow up the implementation of the policy upon approval.²⁰⁵ Moreover, the authority has the duty to ensure that projects, activities and interventions related to water in the basin are, in their content, schedule, impacts and management are in line with the integrated water resources management process.²⁰⁶ The authority also has the duty to monitor ground water level in order to prevent an occurrence of salinity problem in areas where irrigation development works and projects are carried out and cause measures to be taken. Moreover, it is entrusted with the power to issue permit regarding water use in the basin and collect water charge from users.²⁰⁷

According to the head of the authority's branch office at Ziway²⁰⁸, the water level of Lake Ziway is highly being affected as the result of excessive water abstraction in the Feeder Rivers (Meki and Ketar rivers) for irrigation activities. Moreover, around the shore of the lake also, there are many youth engaged in irrigation activities. For instance, in the surrounding of Lake Ziway there are around 5250 water pumps of different sizes abstracting water from the lake excessively and recklessly. And of these 5250 water pumps only a few have secured permit either from Oromia National Regional State or from the Authority. Some don't even know that they need to secure permit to use water from the lake. Since water use charge has not been implemented and the users do not pay for using the lake's water, they abstract water excessively and irresponsibly.

²⁰² See Art. 3(2) of the Rift Valley Lakes Basin High Council and Authority Establishment Council of Ministers Regulation No.253/2011, Neg. Gaz., 17th Year, No.91

²⁰³ Id, Art. 5

²⁰⁴ Id, Art. 6

²⁰⁵ Id, Art. 7(1)

²⁰⁶ Id, Art. 7(3)

²⁰⁷ Id

²⁰⁸ Asegid Ajeme, The Rift Valley Lakes Basin Authority, head of Ziway Branch office, interview held on 26/11/2018, in his office at 3:30 am.

Moreover, deforestation in the basin has caused erosion. Every year much amount of dust enters into the lake from Gurage highlands, Arsi highlands, and from the nearby mountains in the area. And this siltation has resulted in the reduction of the water level of the lake. Sometimes, especially during the rainy season the lake seems full, however what makes it look appear full is siltation not increase in the inflow. Moreover, siltation has the effect of creating turbidity (density of suspended particles) this in turn reduces photosynthesis, which in turn results in reduction of dissolved oxygen. Thus, lack of oxygen affects the fish's breathing. Additionally, because of turbidity fish gills get clogged and it can interfere with their egg production. Hence, it affects their reproduction. Reduction in photosynthesis also affects the development of micro-plankton, which serve as food sources of the fish.



Figure 5 These two pictures were taken at different time from exact location. The first picture (left) was taken from a commonly known place cafeteria in February2018 (during the dry season). The second (right) picture was taken on 06/08/2018 (Ethiopian Summer) during the rainy season when the lake is expected to be full



Figure 6 These two pictures were also taken at different times from a commonly known place cafeteria. The first (left) in February2018 (during the dry season). And the second (right) on 06/08/2018 (during the rainy season when the lake is expected to be full).

As seen from (pictures taken during the rainy season) the lake seems full, however, according to the head of Adami Tullu Jido Kombolcha Environmental Protection Office²⁰⁹, what made the lake appear full is not increase in the inflow from the Feeder Rivers, rather it is siltation.

Therefore, during the rainy season much amount of dust from Gurage highlands, Arsi Highlands and also from nearby elevated areas is washed and enters into the lake and makes the lake appear full.

The lake's volume as it has been seen above from pictures taken during the dry season, its volume highly reduces and it retreats towards the center and the vegetations at the shore of the lake which serve as breeding and nursery grounds for the fish resources dry up. When the lake's water retreats and the land dries, people plough and use it for irrigation purpose. This in turn creates more problem of erosion. Moreover, when the lake water retreats, the vegetation along the shore of the lake which serve as breeding nursery ground also dry up and peoples cut these vegetation for fire wood. And this in turn affects the fish's reproduction. Therefore, as short term solution the town's administration has dug up large ditches to bring the water towards the shore.



Figure 7 This is an exam of wide ditch dug by the city administration to bring the retreating water towards the shore. The picture was taken in November 2018 around Wafiko area.

²⁰⁹Beriso Benti, head of the Adami Tullu Jido Kombolcha Environmental Protection Office, interview held on 27/11/2018, in his office at 5:30 am.



Figure 8 The above two pictures were also taken from exact location known as korekonch haik, around Haile Resort at different times. The first picture (left) was taken in February 2018. The second (right) picture was taken during the rainy season on 06/08/2018. In the second picture though the volume of the lake has increased, it is covered by algae.



Figure 9 The above two pictures were also taken from exact location known as korekonch haik, around Haile Resort at different times. The first picture (left) was taken in February 2018. The second (right) picture was taken during the rainy season on 06/08/2018

To alleviate the degradation that Lake Ziway is facing, the head stated that different conservation activities are being implemented in the basin. Firstly, to solve the problem of excessive water abstraction from the lake and from the basin, water allocation plan is prepared. This is done by studying the current and future water potential and demand in the basin. Concerning Lake Ziway the head affirmed that the water allocation plan for Ziway-Shalla sub-basin is prepared and it

will be implemented soon. Secondly, wetland restoration and rehabilitation through conservation is being done in the basin in collaboration with the community. The authority has a number of nursery stations in different areas in the basin and it is trying to rehabilitate degraded areas through afforestation programs. Thirdly, according to the head, women spend more time collecting and storing water, securing sources of fuel, food and fodder, and managing land forest, wetlands or agricultural terrain. Therefore, as empowering women plays a great role in the conservation of the basin, the authority has engaged in income generating activities to empower women. According to the head the income generating activities such as poultry, beekeeping help the community to have alternative means of livelihood sources. Therefore, those persons who support their livelihood by engaging in charcoal making by cutting trees or selling firewood will stop cutting trees since they resort to poultry or other income generating activities through the support of the authority. People also make use of the conservation and afforestation activities of the authority through beekeeping.

When it comes to challenges the head mentioned the existing huge problem of coordination between Oromia National Regional State and Southern Nation Nationalities and Peoples. The head also mentioned that conflicting government actions are also creating problems. For instance, on the one hand the government stresses on the need to protect the environment and the water sources in the basin from degradation and siltation, and on the other hand in the name of job creation, youth associations are organized by the government and engage in mineral extraction such as soil and other construction materials. And this according to the head is also creating environmental problem such as erosion.

The head also mentioned conflicting mandates between the authority, which is a federal organ, and regional governments. For instance, one of such overlapping mandate is concerning permit for water use. The authority grants water use permit taking into consideration the basin's future perspective in line with integrated water resources management process.²¹⁰ However, regional governments also give such permit and sometimes incidents might occur when a person who is denied water permit by the authority is granted such permit by regional governments.

²¹⁰ See Art. 15 of the River Basin Councils and Authorities Proclamation No. 534/2007, Neg. Gaz., 13th Year, No.40

Budget constrain, embezzlement and mis-use are also creating hurdle in the implementation of the objectives for which the authority was established. For instance, the budget allocated by the authority to Woredas for different conservation activities is used as per diem to officials. Thus, conservation projects are not properly implemented.

4.3. Factors Attributed to Decline in Fish Production

As seen in chapter two Lake Ziway has a fishery potential of more than 6000 tons per year. However, currently the fish catch of Lake Ziway currently declined from 3180 tons in 1997 to 1157.14 tons in 2014.²¹¹ In order to evaluate the problems associated with the current huge decline in fish production on Lake Ziway, interview was conducted with researcher at Oromia Agricultural Research Institute Batu Fishery and other Aquatic Life Research Center. Moreover, data was also collected from the fishermen through questionnaire. Focus group discussion was also made with six fishermen. Moreover, to see the problem on the ground, personal observation was also conducted.

The interview conducted reveals that there are various factors attributed to the decline in fish production.²¹² Among these:-

- a) Chemical effluents released into the lake (both from large scale and small scale irrigations) have damaging effect both on the fish itself and their food resources. Firstly, the chemicals kill the zooplankton (micro-plants used by the fishes as food sources). Secondly, the chemicals kill the fry fishes even with small amount of quantity. Thirdly, the chemical affects the liver and kidneys of the fish which ultimately kills them. According to the researcher though the importation and use of DDT is banned, it is still widely being used and elements of DDT is found in fishes. Moreover, the agro-chemical known as *indosulfan*, which is famously known for killing fishes and bees, is also widely being used in the area. Therefore, even if the extent varies, both the large scale and small scale irrigation practices have their own negative impact on the fish, their food resources and ultimately in the decline of fish production. According to the researcher the agro-

²¹¹ Lemma Abera, supra note 180, p.ii.

²¹² Mathewos Hailu, researcher at Oromia Agricultural Research Institute Batu Fishery and other Aquatic Life Research Center, interview held on 26/11/2018, in his office at 4:30 am.

chemical *indosulfan* has also similar damaging effect on human beings. Exposure to this chemical through different modes could cause cancer, neurological disorder, birth defect such as missing body parts For this reason the chemical has been banned in many countries.

With respect to chemical effluents of Sher Ethiopia, the researcher stated that in 2003 E.C there was mass mortality of fish as the result of the chemical effluents released by Sher Ethiopia into Lake Ziway. According to the researcher even after 2003 E.C, there were still many incidents of mass mortality of fish especially at the outlet where chemical effluent is released. He revealed the fact that these dead fishes as the result of the chemical are collected by employees of Sher Ethiopia so that they will not be seen by authorities or the community. Moreover, he revealed the mass mortality incident that occurred two months ago before this interview was conducted. What made the 2003 E.C. mass mortality of fish different from the others was that, in 2003 E.C., unused chemical packages were also released into the lake.

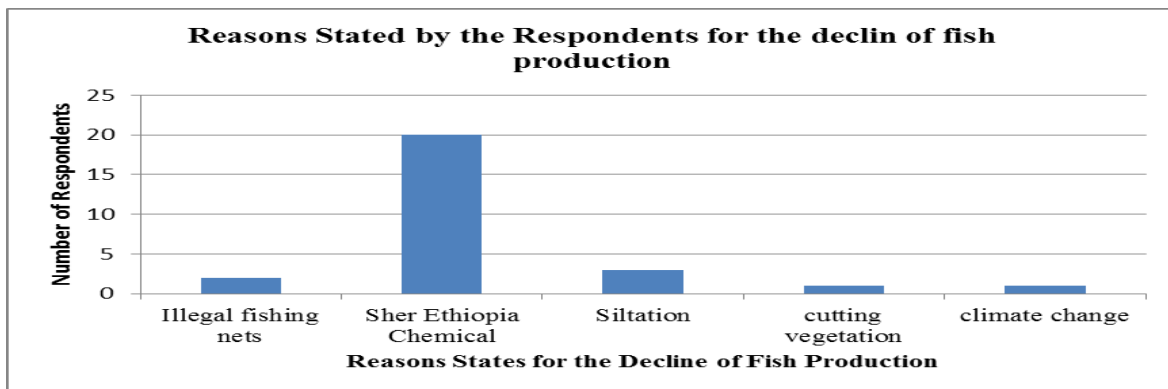
- b) Moreover, according to the researcher, disposal of urban waste both from Assela town and Ziway town, siltation, excessive water abstraction... have their own impact on fish resources. For instance, the researcher stated that recently micro-plastic materials were found in some fishes. These micro-plastics are indigestible and create the effect of clogging of the digestive system, inflammation of gastro-intestinal tissue and preventing absorption of nutrients, interference with immune system and create on the fish the impression of fullness and the fishes do not eat as they feel full and they become malnourished and die.
- c) The researcher also revealed that overfishing is also contributing to the decline in fish production. Juvenile fish are caught before they get mature and reproduce. In other words there is no next generation of fish. In this regard the researcher believes that absence of implementing laws such as regulations and directive are also making the problem worse. According to him, there is proclamation both at the federal and state level. However, there are no detailed regulations and directives which are important to implement some technical matters. For instance, the proclamation is silent about the size of gill nets. Though, expert recommendation of gillnet size is 8 cm, this is not provided in the

proclamation and there are no regulations or directives that provide such detained technical matters. Hence, even if the institute confiscated gillnets which are less than 8 cm many times, and brought the suspects to court, they were released on the ground of absence of expressly provided gillnet size on the proclamation. Hence, absence of detained regulations on technical matters is making implementation is very difficult.

- d) The researcher was also asked if the institute conducts regular impact assessment of these floriculture and horticulture activities on the lake and fish resources, and he replied that the institute has been banned from conducting researches in relation to chemical effects on the fish resources. Thus, currently they are allowed to engage only in research activities such as aquaculture development, installation of aquaculture facility, technology transfer, policy recommendation....

4.4.Fishermen’s Response to Recent Decline of Fish Production

As seen from the foregoing interview and various literatures, the decline in fish production is attributed to a number of combined factors. In this respect questions were forwarded to the fishermen regarding the reasons behind the recent decline in fish production and assess their awareness with regard to the scientific reasons attributed to the decline in fish production. Accordingly, all the fishermen stated that chemical effluent released into the lake by Sher Ethiopia as the reason for the decline. However, during the focus group discussion two of the fishermen stated that siltation and illegal fishing and overexploitation were also additional factors. Regarding the siltation, they stated that the erosion coming from the highland areas was entering into the lake and drying up the breeding and nursery grounds of the fish. They also stated that illegal fishermen who use narrow gill nets were responsible for the decline.



As it has been seen in the above chart, most of the fishermen blame Sher Ethiopia for the decline of fishing. This shows the fishermen's little awareness as to the scientific and other factors that contribute to decline in fish production. From the various literature reviews and expert opinions, the only responsible factor in the decline of fishing is not chemical effluent. There could also be other factors such as decline of water level, overexploitation or fishing juvenile fish, siltation...could have their own share in the reduction.

The key informant also told the researcher that because of unemployment, all sorts of persons including graduate students are engaged in fishing. And this has resulted in overfishing²¹³. In this regard it could be said that open access nature of Lake Ziway results in greater than sustainable fish catch and lower nursery life of the fish.²¹⁴ The diminishing fish catch reduces the income, which directly affects the economic stability of the fishermen.²¹⁵

The fishermen were also asked whether they used legally permitted fishing nets. Though they all did not know what the size of legally permitted fish net size is, they all responded that they use legally permissible nets. (There is no regulation or directive concerning the size of permissible gill nets. Expert recommendation is 8 cm). What the researcher personally observed during survey questionnaire is that most of the gillnets were not more than 4 cm. Hence, small size gill nets are also responsible for overfishing. Since the gillnets used by the fishermen are less than 8 cm, juvenile (fingurlings) fishes are excessively caught. In other words fishes are caught before they reach maturity and lay eggs or before they reproduce themselves. This means no next generation. Thus, this has also huge impact in the recent decline.

The key informant also told the researcher that, they were thought that their gillnets should be 8cm. However, illegal fishermen use narrow gillnets and this has resulted in overfishing. According to him the authorities from the town's agriculture office control only the legal fishery associations and they don't control the illegal ones. Thus, in his opinion, it is the illegal fishermen who are both the beneficiaries and destroyers of the lake's fish resources.

²¹³ Gutu Tuna, key informant, He has been engaged in fishery activity on Lake Ziway for more than 40 years, and still he is engaged in fishing and he also owns boats. Interview held on 11/11/2018, in his home at 4:30 p.m

²¹⁴ Alebachew Tilahun, et.al," Fish Production Constraints in Ethiopia: A Review", World Journal of Fish and Marine Science, Vol.8(3), 2016, pp.158-163.

²¹⁵ Ibid

4.5. Implementation of EIA laws in the study area

With the view to appraise EIA compliance of the development activities going on under the jurisdiction of Ziway town administration, and Adami Tullu Jido Kombolcha Woreda, and to evaluate conservation activities undertaken, interview was conducted with the head of the Oromia National Regional State Batu Town Environmental Protection, Forestry and Climate Change Authority²¹⁶ and Adami Tullu Jido Kombolcha Environmental Protection Office.

According to Adami Tullu Jido Kombolcha Woreda Environmental Protection Office head, EIA was unknown before 2000 E.C. and no EIA was done on projects in Ziway town and Woreda. However, currently EIA is required before any project is implemented. According to the head Castel Winery, which is under the jurisdiction of the Woreda, has conducted EIA. Further he stated that the EIA showed that the winery had no adverse impact on the environment. The head even mentioned that the Winery conducts environmental auditing at least once a year. And no chemical effluent is released by the winery into the lake. Moreover, the head mentioned that the winery conducts forestry activities around the shore of the lake.²¹⁷

Personal observation was also made by the researcher to assess the environmental safeguards put by Castel Winery. Accordingly, a question was put to an expert at Castel Winery²¹⁸ concerning safeguards against environmental harm by chemicals and pesticides. The expert stated that there is only factory residue and that there is no effluent. According to the expert the factory produces wine two times a year and residue also happens only two times a year. This residue from the production is collected in a large evaporation pond. This evaporation pond helps to dispose the production residue through evaporation and it has no leakage.

²¹⁶Tahir Hedeto, Oromia National Regional State Batu Town Environmental Protection, Forestry and Climate Change Authority, interview held on 26/11/2018, in his office at 4:30 p.m.

²¹⁷Beriso Benti, head of the Adami Tullu Jido Kombolcha Environmental Protection Office, interview held on 27/11/2018, in his office at 5:30 am.

²¹⁸ Solomon Terefe, Agronomist at Castel Winery, Ziway, Ethiopia, interview held on 11/12/2018, in his office at 7:10 am.



Figure 10 This is evaporation pond build by Castel Winery at the back of their wine yard. Residue from the factory is transported through pipe and collected in this pond.

Concerning the agro-chemicals used by the factory, the expert stated that since their wine plants are healthy, they don't use strong agro-chemicals. Moreover, the expert stated that since wine is a food product, they use only food grade chemicals. According to the expert grape by its nature is disease resistant. Thus, they don't use strong chemicals like used in floriculture farms. According to him since they use water from the lake through 45⁰ canal build; the water used by the factory does not have relation with the lake. And nothing retreats to the lake.

Despite, the use of less strong chemicals, the expert stated that there is no study conducted on the impact. Thus, research has to be conducted to see its effect. Moreover, the expert stated that they conduct wine analysis two times a year in international laboratories in France, and the result reveals that there are no problems with their product and they are ISO22000/2005 certified.

He also stated that the chemicals are WHO certified. However, since quality defect was found currently, they are on the process to conduct food safety system management. Concerning water use the expert stated that since they use dripping technology, their winery don't consume much water. The company's daily water consumption is 8,674.8 m³.

Interview was also conducted with the head of Oromia National Regional State Batu Town Environmental Protection, Forestry and Climate Change Authority. According head of the authority the ph level of Lake Ziway was almost neutral some years back and the lake was the freshest water in the Rift Valley Lakes Basin. He stated that, currently the lake's ph level has

changed. According to him chemical effluents released both from large scale and small scale irrigation activities are responsible for the change in the water chemistry of the lake. He also revealed that previously Lake Ziway used to serve as the only drinking water supply for residents of Ziway town. However, currently since the lake was polluted by various chemicals, a decision was made to install drinking water supply to the town from Sedeseden, 50 km away from Ziway town. This drinking water supply has begun giving service to the residents of the town though not on daily basis. Of course this is attributed to low quality pipelines used to transport the water from the above stated area.

As elaborated in chapter two, EIA is a process that evaluates the potential environmental impact of a certain development project. This evaluation happens in the planning, design, decision making and implementation stages. In these stages follow-up (monitoring, auditing, post decision analysis) is plays a significant role. In this respect federal and regional pertinent government offices have the obligation to assure whether the proponents are complying with the EIA standards. During the interview with the head of Oromia National Regional State Batu Town Environmental Protection, Forestry and Climate Change Authority, with regard to EIA compliance of Sher Ethiopia, he stressed that EIA was conducted by Sher Ethiopia. However, according to the head the EIA study report lacks quality (Though the head claims that EIA was conducted by Sher Ethiopia, it must be noted here that Sher Ethiopia was established before the enactment of the EIA Proclamation). When it comes to environmental auditing, the head stated that no environmental auditing was conducted by the floriculture. He also revealed the fact that they were not willing to do that. According to him, let alone to conduct environmental auditing, officials of the town were not even allowed to enter and visit the flower farms. He revealed, however, currently the floriculture managements are opening up a bit as the result of the media outcry.

To evaluate the environmental safeguards put by Sher Ethiopia, interview and personal observation was made by the researcher. According to the interview conducted with the manager of Sher Ethiopia²¹⁹, the manager admitted that there were issues with chemical use, waste treatment and disposal when floriculture was established. However, these problems are progressively solved. He mentioned that currently the floriculture uses 20% chemical and 80%

²¹⁹Abera Mamo, Manager of Sher Ethiopia, Ziway, Ethiopia, interview held on 16/12/2018, in his office at 5:10 pm.

Integrated Pest Management. He said that the floriculture uses chemical only if the flower disease cannot be healed using Integrated Pest Management.

The manager also mentioned that Sher Ethiopia is a member of Fair Trade. As a member of Fair Trade the floriculture is expected to meet certain conditions with respect to type of chemicals used, waste management, working conditions, workers' rights.... According to the manager their buyers come regularly and visit their farms and ensure if the conditions are met. Unless the conditions are met, the buyers do not buy the flowers. The manager also stated that currently there is no any chemical effluent released into the lake.

According to the manager, fertilizers and pesticide residue from washing of equipment, leakages from the vocum houses are collected in big holes using water way. These collected effluents are treated using artificial wetland systems. After the effluent is treated it is re-used (the daily water consumption of Sher Ethiopia alone is around 123,000 m³)²²⁰. Therefore, there is no effluent that is released into the lake. However, the other floriculture clusters in Sher Ethiopia²²¹, use 100% chemicals and they don't use Integrated Pest Management. Moreover, they don't have artificial wetland systems.²²²



Figure 11 The picture on the left shows the vocum house where fertilizers are mixed. There are also chemical houses. All the effluents from washing equipment, clothes are collected in one place and treated using the artificial wetland system on the right.

²²⁰ Sintayehu

²²¹ AQ Roses, Braam Flowers, Herburg Rose and Ziway Roses are flower farms sub-leased by SherEhiopia.

²²² Sintayehu

Moreover, to see what the Oromia National Regional State is doing about the environmental problems around Lake Ziway, interview was conducted with the head of Environmental Protection Follow up Directorate²²³, at Oromia Environment, Forest and Climate Change Authority. According to the head, the lands around the lake were given to the investors before the Environmental Impact Assessment Proclamation was enacted. Thus, no EIA was conducted by the floriculture and horticulture farms. However, after the farms were established they have conducted Environment Management Plan and they are progressively improving.

According to the head, Lake Ziway is polluted both by large scale and small scale irrigation activities. Especially the small scale irrigation use banned chemicals such as DDT and indosulfan. According to the head the farmers get these chemicals through contraband and even from certain government offices. The reasons for this according to the head are:

Firstly, the government is not providing eco-friendly pesticides. Thus, peoples resort to cheap and effective agro-chemicals which enter into the country illegally. Secondly, the government has no policy on agro-chemicals, which provides on the types and amount of chemicals that must be used by farmers. Thirdly, even though the power to control agro-chemicals that enter into the country is given to Ministry of Agriculture, the Ministry is not discharging its duty. Fourthly, the head stated that there is a problem with the land use plan. He stated that conducting agriculture activities around ecologically sensitive areas, such as water bodies has major impact on water resources. Thus, according to him the lands around Lake Ziway should have been used for Lodges or Hotels. Finally, the head mentioned the existing capacity gap concerning laboratory materials, skills...

Concerning the conservation activities, the head mentioned that all the afforestation programs are conducted just for the sake of number and report. Thus, awareness creation programs have to be conducted to create sense of ownership among the community.

²²³Sintayehu Fikadu, Agronomist at Castel Winery, Ziway, Ethiopia, interview held on 20/12/2018, in his office at 2:00 pm.

4.6.Degradation and Chemical Pollution of Lake Ziway as a Violation of Range of Human Rights of Fishermen

Environmental problems being observed on Lake Ziway may be direct violations of the right to clean and healthy environment. However, these environmental problems also lead to violations of other rights. Thus, violation of the right to clean and healthy environment may also be seen as an indicator of violation of other rights. This is because human beings are dependent on natural resources for their very survival and their degradation leads to violation of many other human rights. For instance, degradation of natural resource base may lead loss of livelihood, food resources, malnutrition, and deterioration of people's health....

Moreover, human rights are interdependent and interrelated. This interdependent and interrelated nature of human rights is also recognized in a number of international documents including, Declaration on the Right to Development, Vienna Declaration and Program of Action. Thus, the environmental concerns observed on Lake Ziway could indicate violations of other human rights. Some of these violations are provided herein below as illustrations.

4.6.1. The Right to Food

Food is essential to life. Food provides the basic subsistence for physical survival and nutrition for human existence.²²⁴ The right of everyone to adequate food for himself and for his family is given recognition in several human rights instruments under international law. For instance, Art. 11 of the ICESCR, which Ethiopia has ratified, recognizes “the right of everyone to an adequate standard of living for himself and for his family, including food, clothing and housing”. This provision should also be seen in line with Art. 25 of the UDHR, which also recognizes “everyone's right to a standard of living adequate for the health and well-being of himself and of his family, including food...”

The African Commission has also reaffirmed the implicit recognition of the right to food under the African Charter on Human and Peoples' Rights in provisions such as the right to life (Art. 4),

²²⁴Gebremedhin Birega, supra note 170, p.1-31.

the right to health (Art.16), the right to economic, social and cultural development (Art.22).²²⁵ The UN Committee on Economic, Social and Cultural Rights in its general comment number 12 also noted that the human right to adequate food is of crucial importance for the enjoyment of all rights.²²⁶

Coming to the obligation the right to food entails, as discussed under chapter two, governments have at least three levels of obligations with respect to human rights. Thus, the right to food like other human rights imposes three types or levels of obligations on States parties: the obligations to *respect*, to *protect* and to *fulfill*. Most importantly the obligation to *protect* is relevant to the discussion at hand. This obligation requires measures by the State to ensure that enterprises or individuals do not deprive individuals of their access to adequate food.²²⁷ The Committee on the Economic, Social and Cultural Rights in its general comment number 24, with respect to States' obligation pertaining to businesses also provides that the State is under obligation to prevent the infringement of economic, social and cultural rights by businesses.²²⁸

As discussed above, there are many fishermen who are entirely dependent on Lake Ziway fish resources. These fishermen had farming land before 1979. In the survey questionnaire and focus group discussion the fishermen told that their land was expropriated by the then government without compensation and given to ETCO, the land which is currently irrigated by Sher Ethiopia. Hence, they get their livelihood from fishery only. Thus, they use fishing as food source both for themselves and their family. They also support their children's education with the income they get from fishery. However, fish resources are depleting and one of the causes is a chemical effluent entering into the lake from large scale and small scale irrigation practices near the shore. These chemicals are killing the fish's food sources, fry fish and big fishes. And frequent mass mortality of fish is observed especially at the outlet of the flower farms. This in turn is highly

²²⁵ Decision of the African Commission on Human and Peoples' Rights, *Social and Economic Rights Action Centre (SERAC) and Another v Nigeria* (2001) AHRLR 60 (ACHPR 2001) *para. 65*.

²²⁶ UN Committee on Economic, Social and Cultural Rights, General Comment No. 12, The right to adequate food, Geneva, 26 April-14 May 1999 Agenda item 7, E/C.12/1999/5 para.1.

²²⁷ *Id.*, para.15

²²⁸ UN Committee on Economic, Social and Cultural Rights, GENERAL COMMENT 24, State obligations under the International Covenant on Economic, Social and Cultural Rights in the context of business activities, 29 May-23 June 2017, E/C.12/GC/24, para.14.

affecting fish reproduction and production. Hence, less fish reproduction and mass mortality means less fish catch. Thus, this is ultimately affecting their livelihood

In the focus group discussion the fishermen revealed that they complained the existing pollution on Lake Ziway, mass mortality of fish as the result of the chemical effluent released by the flower farms, and its impact on fish resources to government and private media many times. They even contributed 50 birr each, including their children, and selected persons to represent them and complain their issue with the Caffee Oromia. However, even if the complaint has been lodged to Caffee Oromia, nothing has been done until now. The problem still continues. According to them, “Sher Ethiopia”²²⁹ stopped releasing chemical effluents into the lake during daytime only. And chemical effluent is still being released by the floriculture into the lake at night and many fishes are still dying at the outlet.

During the focus group discussion one of the fishermen told angrily that even the mayor of Ziway town threatened him saying “you cannot do anything”. They also revealed the fact that there are a number of “Aba Gedas” who are bribed by Sher Ethiopia to silence the claim of the fishermen. Hence, the fishermen are feeling very frustrated. Initially, they were unwilling to conduct the interview and focus group discussion saying that they were sick and tired of many peoples and media coming and asking them many fruitless questions.

Here failure of the government to protect Lake Ziway from chemical effluents by the flower enterprises and individuals, that resulted in the contamination, mass-mortality, and ultimate depletion of fish resources, must be understood as failure to comply with the obligation to adequate standard of living, which includes food.

As seen under chapter two, in *Social and Economic Rights Action Centre (SERAC) and Another v Nigeria*²³⁰ the African Commission held the Nigerian government liable for the violation of the right to food of the Ogoni for failing to take measures when Shell Petroleum disposed toxic wastes in the environment and local water ways, and affected the fishing and farming resources of the Ogoni people. Similarly, failure of the Ethiopian government to protect Lake Ziway from

²²⁹ The fishermen use the name Sher Ethiopia to describe all the flower farms at the shore of Lake Ziway, However, it must be noted that apart from Sher Ethiopia (Afri Flora) there are also four other flower farms at the shore. These are, Braam Flowers, Herburg Rose, AQ Roses, and Ziway Roses.

²³⁰ Decision of the African Commission on Human and Peoples’ Rights, supra note 19, para.64-66

chemical pollution by enterprises and individual could be seen as violation of the right to food of the fishermen. Of course pollution of Lake Ziway could have various implications and effects on wide range of rights of all those who rely on the lake's water and aquatic resources. However, since fishermen are the main target of this thesis special focus has been given to various human rights of fishermen.

4.6.2. The Right to Life

As explained in chapter two, the term “inherent right to life” under Art. 6(1) of ICCPR, should not be interpreted in a restrictive manner. The right to life entails both negative and positive obligations. The negative obligation compels the State not to deprive individuals of their right to life. And the positive obligation requires the State to take positive measures for the effective realization of the right. For instance, outside of the criminal context, the State has the obligation to take measures to reduce the impact of environmental degradation and pollution on the right to life of individuals.²³¹ In this respect the Human Right Committee was conscious of the fact that environmental degradation, climate change and unsustainable development constitute some of the most pressing and serious threats to the ability of present and future generations to enjoy the right to life. This is because the effective protection of the right to life is the prerequisite for the enjoyment of all other human rights. Hence, it obliges States to incorporate contents of the right to life in their environmental law. According to the Committee the Implementation of the obligation to respect and ensure the right to life, and in particular life with dignity, depends, inter alia, on measures taken by States parties to preserve the environment and protect it against harm, pollution and climate change caused by public and private actors.²³² Thus, positive obligation should not be interpreted in a restrictive manner.

For instance, as elaborated in chapter two, *Indian Council for Enviro-Legal Action v. Union of India*, the water resource in Bichhri village was polluted as the result of the toxic sludge released to the environment by Silver Chemicals, and Jyoti Chemicals.²³³ The chemical sludge rendered the water resource unfit for human and animal consumption. Moreover, the water was also unfit for irrigation practices. The toxic sludge also resulted in various diseases and death of the

²³¹ The Human Rights Committee on the International Covenant on Civil and Political Rights General Comment No. 36, para. 26

²³² Id, para 36

²³³ Donald K.Anton and Dinah L.Shelton, supra note 39, p.17.

community. Hence, the Indian Supreme Court held that the environmental pollution seriously undermined the lives of the Bichhri residents as indicated under article 21 of the Indian Constitution. Thus, the government was held liable for the violation of the right to life of the Bichhri residents for failing to discharge its statutory obligations. In *Social and Economic Rights Action Centre (SERAC) and Another v Nigeria*, the African Commission had also similar observation. The Commission averred that the pollution and environmental degradation of Ogoni land was to a level humanly unacceptable. Moreover, it held that "...the survival of the Ogonis depended on their land and farms that were destroyed by the direct involvement of the government. These and similar atrocities not only persecuted individuals in Ogoni land but also the Ogoni community as a whole. *They affected the life of the whole of the Ogoni society.*"(Emphasis added). Moreover, the right to life concerns the entitlement of individuals to be free from acts and omissions that are intended or may be expected to cause their unnatural or premature death, as well as to enjoy a life with dignity.

As elaborated in the foregoing discussions, Lake Ziway is being affected by chemical effluents and this is becoming a serious threat for fishery resources of the lake. Food resources of the fish, fry fish and big fish are dying as the result of the chemicals. This has its own share in the recent decline of fish production which affected the livelihood of the fishermen. Moreover, though the fishermen are putting a lot of effort to make their voice heard about the environmental problems surrounding the lake, the government has not been seen putting significant effort to resolve the problem.

As previously stated in Chapter one and two, even though Lake Ziway is deemed unsuitable for various purposes, there are still many peoples who use the lake's water including for domestic consumption. And this domestic consumption could cause various diseases, even premature death due to the presence of agro-chemicals such as DDT, and indosulfan.

In the case of Lake Ziway even though there is no study or data on death occurrence as the result of drinking the lake's water, one could, however, conclude that it could result in complex health problems that could lead to premature death. Moreover, it is logical to say that exposure to the

above chemicals could possibly kill human as there are incidents where cattle died after drinking the contaminated water.²³⁴

Hence, the government's failure to take measures to stop the release of chemicals into the lake could be seen as the violation of the obligation to protect the right to life. Although it is not the focus of this thesis during the focus group discussion it was revealed that there were many incidents of abortion, and infants born with physical defects observed on women who work in Sher Ethiopia.

4.6.3. The Right to Health

Health refers to “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”.²³⁵ Health is a fundamental human right that is indispensable for the exercise of other human rights. This right has got recognition in a number of international human rights instruments. Art. 25(1) of the UDHR provides that “Everyone has the right to a standard of living adequate for the health of himself and of his family, including food, clothing, housing and medical care and necessary social services”. Art. 12 of the ICESCR also provides the most comprehensive article of the right to health. Art. 12(1) recognizes the “the right of everyone to the enjoyment of the highest attainable standard of physical and mental health”. Art.12 (2) enumerates the steps that have to be taken by the State for the effective realization of the right. Art. 16 of the African Charter on Human and Peoples' Rights also recognizes that: “Every individual shall have the right to enjoy the best attainable state of physical and mental health.”

The State has the obligation to protect individuals from the violation of the right to health. The UN Committee on Economic, Social and Cultural Rights in its general comment no. 14 stated that violations of the obligation to protect follow from the failure of a State to take all necessary measures to safeguard persons within their jurisdiction from infringements of the right to health by third parties. The failure of the State to regulate the activities of individuals, groups or corporations so as to prevent them from violating the right to health of others constitutes

²³⁴ In the focus group discussion the fishermen revealed that there were many incidents of cattle death as the result of drinking this contaminated water.

²³⁵ The UN Committee on Economic and Social Rights, General Comment number 14, The right to the highest attainable standard of health , Geneva, 25 April-12 May 2000, Agenda item3, E/C.12/2000/4, para.1.

violation of the right to health.²³⁶ Moreover, the general comment states that “the failure to enact or enforce laws to prevent the pollution of water, air and soil by extractive and manufacturing industries constitutes violation of the obligation”.

Coming to the case at hand, Ethiopia has adopted a number of domestic legislations. Moreover, it has also ratified most of the major international human rights instruments which are sufficient to curb the environmental damage on Lake Ziway and reduce its adverse impact on the health of individuals. However, it has failed to comply with its obligation.

As seen from many literatures, Lake Ziway is polluted as the result of the agro-chemicals from irrigation practices near the shore. For instance, the presence of heavy metals such as mercury in some fishes is ascertained by researchers. Moreover, DDT, indosulfan have also been found in fishes. These chemicals cause many serious short- and long-term health problems both to humans and animals. In this regard fishermen are the most vulnerable sections of the community as their livelihood is dependent on fishery. The survey questionnaire reveals that all the fishermen use fish both for consumption and for sale. Hence, as daily consumers, they are most vulnerable to health problems stated above.

In order to request the government to execute its statutory obligation to protect, the fishermen had brought their concern to Caffee Oromia through their representatives. Moreover, government and private media have also echoed on the existing huge environmental concern on Lake Ziway and the health complication it causes. However, the government had turned a deaf ear to the situation. Hence, as the African Commission rightly noted in *Social and Economic Rights Action Centre (SERAC) and Another v Nigeria*²³⁷ government’s tolerance of the individuals and enterprises who are harming the environment, and its failure to conduct environmental auditing to ascertain the existing harm on humans, animals and the environment in general, constitutes violation of the right to health.

²³⁶ Id, para 51.

²³⁷ *Social and Economic Rights Action Centre (SERAC) and Another v Nigeria*²³⁷ para.50 and 52

4.6.4. The Right to Livelihood

The right to livelihood could simply be understood as the means by which life could be lived. It contributes to the survival of both the individual himself and his family. As elaborated under chapter two, the right to livelihood has been given express recognition in different international human rights instruments as the right to work.²³⁸ Moreover, it is also implicitly found in such rights as the right to life, the right to food, the right to house, dignity....

Like other human rights, it imposes three levels of obligation for its effective realization.²³⁹ The Committee on the Economic, Social and Cultural Rights in its general comment number 24 with respect to States' obligation pertaining to businesses, provides that the State is under obligation to prevent the infringement of economic, social and cultural rights by businesses such as the flower farms at the shore of Lake Ziway, by taking different legal or administrative measures.

The survey questionnaire and the focus group discussion reveal that fishery is the only source livelihood of the informants. They use fishing both for consumption and to fulfill the needs of their dependents (family). During the focus group discussion they also revealed that due to the recent huge decline in fishing, they are unable to feed their family and for this reason their children are also spending their school time with them to catch fish.

In the context of this research, the researcher believes that Lake Ziway could be understood as the means by which fishermen fulfill their right to livelihood. Hence, the government is under obligation to protect this means of livelihood by preventing those businesses from damaging this livelihood source.

In general human rights by their nature are interdependent and interrelated. The violation of one right has negative implication on the enjoyment and fulfillment of other right. Thus, the

²³⁸ International Covenant on Economic, Social and Cultural Rights, 1966, Articles 6, 7; International Covenant on Civil and Political Rights, 1966, Article 8 (3); International Convention on the Elimination of all forms of Racial Discrimination, 1965, Article 5 (e) (i); Convention on the Elimination of all forms of Discrimination against Women, 1979, Article 11 (1); Convention on the Rights of the Child, 1989, Article 32; Convention on the Protection of all Migrant Workers and members of their Families, 1990, Articles, 11, 25, 26, 40, 52, 54.

²³⁹ UN Committee on Economic Social and Cultural Rights, General Comment 18, The Right to Work, Geneva, 7-25 November 2005 Agenda item 3, E/C.12/GC/185 para.10-23.

degradation of Lake Ziway by various factors such as chemical, water depletion, siltation...has a wide range of impact on the human rights of fishermen.

Chapter Five

Conclusion and Recommendations

5.1. Conclusion

Ethiopia is one of the least developing countries, and it is engaged in various mega projects by allocating billions of dollars. Moreover, it is also taking various incentive measures to invite foreign investors to engage in different economic activities in the country. However, unless precautionary measures are taken in the course of these economic activities, they could cause irreversible damage to the environment. And environmental damage could lead to loss of resources which in turn leads to persistent decline of socio-economic conditions of local communities.

Lake Ziway area is one of the suitable areas for agricultural practices. For this reason many foreign and local investors are engaged in small scale and large scale floriculture and horticulture activities. While these small scale and large scale irrigation practices are creating the badly needed job opportunities to thousands of unemployed youth, they are also causing environmental concerns.

These small scale and large scale irrigation practices use huge amount of water and agro-chemicals. The agro-chemicals used by these irrigation activities enter into the lake via run off. Moreover, floriculture industries located at the shore of Lake Ziway are also creating pressure on the water quality of the lake. For instance, some of the flower farms at the shore have been applying waste management. However, most of the flower farms do not have waste management. Thus, fertilizers and pesticides residues from washing of equipment, leakages directly discharged into the lake via the water way without any waste treatment procedure to reduce the pollutants.

The small scale irrigations practices also use various agro-chemicals including banned agro-chemicals such as indosulfan and DDT. Moreover, since the small scale irrigation practices use furrow irrigation system, it is easy for agro-chemicals to enter into the lake through run off.

Effluents from the flower farms and pesticides from horticulture activities at the shore of the lake can migrate via water into the food chain as well, ultimately being consumed by humans/ animals in food. These chemicals have negative impact on humans, animals and fish resources. Exposure to these chemicals through different modes could cause cancer, neurological disorder, and birth defect such as missing body parts on humans. Moreover, these chemicals kill fish resources.

The water volume of Lake Ziway is also being affected by negative water balance. Day by day huge amount of water is abstracted for various purposes. As the result of the reduction in the water level of the lake, vegetation around the lake which serve as breeding and nursery grounds for fish are drying up. Moreover, there are recurrent problems of mass fish mortality as the result of chemical effluents released into the lake. Siltation is also affecting the breeding and nursery grounds of the fish. All these cumulative factors have their own negative impact on fish reproduction and fish production. This has ultimate effect on the right to livelihood of fishermen.

Recently, there is a huge decline of fish production due to the above stated factors. As the result of this, the fishermen complain that they are unable to feed themselves and their family. Even children of the fishermen are also spending their school time on fishing with their parents.

Ethiopia has adopted and ratified all the major human rights instruments, both at the UN and OAU/AU level. These international and regional human rights instruments to which Ethiopia is a party guarantee the right to clean and healthy environment, which is considered as a pre-requisite for the enjoyment of other human rights. And these international and regional human rights instruments to which Ethiopia is a party are considered as part and parcel of the law of the land.

In addition to being a party to major human rights instruments, Ethiopia has also given constitutional recognition to the right to clean and healthy environment. Moreover, the country has also enacted various legislations, both at the Federal and Regional level, with the view to protect the environment. Enacting laws to protect the environment could be one step. However, the government should do more than enacting legislations. Moreover, lack of political will on the part of the government to practically utilize the existing laws and mechanism is another challenge.

Environmental degradation on Lake Ziway could be seen as the violation of the right to clean and healthy environment. Moreover, environmental degradation could also lead to violation of other rights. This is because human rights by their nature are interdependent and interrelated. Thus, since human beings are dependent on natural resources for their survival, damage to the environment could lead to violation of other rights. For instance, the degradation of Lake Ziway because of agro-chemicals, excessive water abstraction and siltation problems are affecting fish reproduction and production. And this is affecting a wide range of human rights of the fishermen such as the right to life, the right to food, the right to health, the right to livelihood, education....

In general agro-chemicals, excessive water abstraction and siltation, overfishing and illegal fishing are affecting the fish resources of the Lake. This in turn is affecting the livelihood of fishermen. Most of the fishermen are unable to feed themselves and their family. Thus, their children are also compelled to skip school and spend their school time in fishing activities.

5.2. Recommendations

The analysis of this research paper focuses on the impact of agro-chemicals, excessive water abstraction, siltation..., on the fish production on Lake Ziway, and their ultimate impact on the right to livelihood of fishermen. Accordingly, attempt has been made to gather information on the cause of degradation of Lake Ziway, decline of fish production, and the applicable laws to curb the existing problems. Hence, based on the research findings the researcher has made the following recommendations.

- a) One of the reasons for the huge decline of fish production is the depletion of Lake Ziway water level and drying up of the breeding and nursery grounds of fishes. And one of the reasons for the decline of the water level is excessive and unsustainable water abstraction both in the upstream and downstream areas for various irrigation activities. In this regard even though there is a law that compels users to pay charge for using the lake's water, this has not been implemented properly. Moreover, the conflict of interest between the Oromia National Regional State and the Rift Valley Lakes Basin Authority (which is a federal organ) on water pricing, has made the implementation very difficult. Hence, since users do not pay for using the lake's water, they abstract excessive amount of water irresponsibly. Therefore, water pricing could help users to use the water resource responsibly and in a sustainable manner.

- b) Researches done on impact of climate change on the water level of Lake Ziway reveal that the lake will shrink by up to 25km² in the coming three decades. This time could even be shorter considering the existing excessive water abstraction. Thus, apart from water pricing, compelling farmers to use dripping technology and water-reuse after treatment could be quite important.
- c) The other problem for the reduction of the water level of Lake Ziway is siltation due to soil erosion that brings in silt soil to the lake as a result of farming in adjacent lands (that should have been reserved for vegetation cover through tree planting and natural forest preservation). Moreover, the rivers and streams that flow into the Lake throughout the year (and particularly during the rainy season) bring much amount of silt soil from Gurage highlands and Arsi highlands. Siltation reduces the water level of the lake, and can cause the drying up of the breeding and nursery grounds of fishes. Hence, establishing buffer zone is necessary. Firstly, the buffer zone should be fenced as protected area and various afforestation activities should be done on the protected area. Thus, it will reduce the dust that enters into the lake. Secondly, the buffer zone also helps to reduce the agro-chemicals that enter into the lake and kill the fish resources. In this regard an administrative decision has been made by the government ordering the floriculture industries to retreat 500 meters from the shore of Lake Ziway. Thus quick implementation of this administrative decision is essential to mitigate the impact of the flower farms on the lake.
- d) Ethiopia's economy is dependent on agriculture which has poor performance. To improve the performance of the agriculture sector and feed the growing population, the government is encouraging farmers to use agro-chemicals such as pesticides and fertilizers. However, farmers mis-use and abuse pesticide and fertilizers and these mis-use and abuse are poisoning the environment and causing health effect on humans and animals. The government is trying to control the manufacturing, importation, use, quality, disposal, registration...using legal frameworks. However, there are problems in the implementation of the laws. For instance, there is Pesticide Registration and Control Proclamation No. 674/2010. Its objective is to lay down scheme of control which would minimize the adverse effects that pesticides use might cause to human beings, animals, plants and the environment. However, there are gaps in the implementation of this

proclamation. For instance, there is no effective registration system, little attention is given to the toxic effect of chemicals, pesticide registration office also lacks educated staff, laboratory materials, monitoring effect of pesticide on the environment and human health.... Such power is given to the Ministry of Agriculture. However, the ministry does not seem to comply with its obligation. Moreover, there are also some similar problems with the Fertilizer Manufacturing and Trade Proclamation No.137/1998. Therefore, Ministry of Agriculture should comply with its obligation in both the proclamations.

- e) One of the reasons for the recent huge decline of fish production on Lake Ziway is overfishing and illegal fishing. Even though the expert recommendation on gill net is 8 cm, the fishermen use gill nets which are not even 4 cm. Thus, everyday juvenile fishes are caught before they reach maturity and reproduce. In other words the small fish nets used by fishermen are destroying the next generation. In this regard absence of regulation that provides detailed technical matters is becoming a hurdle. Having a regulation that provides on the permissible size of fish net is very important to make fishermen who use illegal fishnets liable. Therefore, the government should enact regulation on the permissible size of fish nets. Moreover, for the interests of the majority of fishermen in Lake Ziway, the management of fisheries is preferably to rely on closed seasons, closed fishing areas, restriction on number of fishers, catch quotas, mesh size restriction.
- f) To reduce the impact of chemical effluents on the water quality and fish resources of Lake Ziway by flower farms, having effective artificial wetland system is very crucial. However, except one of the flowers farms, most of them do not have artificial wetlands. Therefore, chemical effluents are directly released into the Lake by these flower farms. In this regard Oromia Environment, Forest and Climate Change Authority should compel all the flower farms to establish effective artificial wetland systems.
- g) Recently more than a hectare of hyacinth is found on Lake Ziway. Unless this problem is solved in the earliest stage, it could engulf the whole lake and become environmental disaster. Therefore, Ziway town's administration, the community and the stakeholders should put effort to destroy the expanding hyacinth before it engulfs the whole lake.
- h) Lack of capacity is another problem. Environmental Impact Assessment study is a very technical matter that requires modern equipment and educated man power. However, in

Ethiopian there is not even a single institution that is capable of conducting such sophisticated chemical analysis. Moreover, in Ethiopia even though there are professionals in the area, they need capacity building trainings to strengthen their knowledge.

- i) Finally, comprehensive research must be conducted on Lake Ziway to assess the extent of the damage on the water quality, water quantity, human and animal health as the result of agro-chemicals. In this respect Memorandum of Understanding has already been signed between Addis Ababa University and Oromia Environment, Forest and Climate Change Authority to conduct comprehensive study. This research helps to know the source problem and who the polluter is. Thus, after comprehensive research is conducted, it would be easy to compel the polluter to pay for the damage it has caused or even to close it down.

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Annex

Interviews

1. Abera Mamo, Manager of Sher Ethiopia, Ziway, Ethiopia, interview held on 16/12/2018, in his office at 5:10 pm.
2. Beriso Benti, head of the Adami Tullu Jido Kombolcha Environmental Protection Office, interview held on 27/11/2018, in his office at 5:30 am.
3. Mathewos Hailu, researcher at Oromia Agricultural Research Institute Batu Fishery and other Aquatic Life Research Center, interview held on 26/11/2018, in his office at 4:30 am
4. Sintayehu Fikadu, Environmental Protection Follow up Directorate, at Oromia Environment, Forest and Climate Change Authority, interview held on 20/12/2018, in his office at 2:00 pm.
5. Solomon Terefe, Agronomist at Castel Winery, Ziway, Ethiopia, interview held on 11/12/2018, in his office at 7:10 am.
6. Tahir Hedeto, Oromia National Regional State Batu Town Environmental Protection, Forestry and Climate Change Authority, interview held on 26/11/2018, in his office at 4:30 p.m.

Themes of Discussion with various organs and persons

A. Themes of Discussion with Oromia Agricultural Research Institute Batu Fishery and other Aquatic Life Research Center

1. What are causes of environmental problems around Lake Ziway area?
2. What are the impacts of the environmental concerns on the livelihood of fishermen?
3. Do you think the government (town's administration) gives due attention to fishing as one form of livelihood?
4. What is the impact of the floriculture and horticulture activities around lake Ziway on the lake and the fish resources of the lake.
5. What is the reason behind the recent decline of fish production?
6. In 2003 there was mass fish mortality because of the chemical effluents release by Sher Ethiopia. Has that problem re-occurred?
7. Does your institution conduct regular impact assessment of these floriculture and horticulture activities on the lake and its fish resources?

8. How do you see the turbidity, salinity and water level of the lake and its resulting effect on the fish resources and livelihood of the fishermen?
9. What could be the role of the government and the local administration to alleviate the existing environmental concerns and solve the livelihood issues of the fishermen?
10. What are the regulatory measures undertaken? Mess size, catch limit, closed seasons, or closed areas? Does your institution ensure fishermen's compliance with proclamation 178/2005?

B. Themes of Discussion with FDRE Rift Valley Lakes basin Authority Batu/Ziway Branch office

1. When and why was the FDRE Rift Valley Lakes basin Authority established?
2. What is the authority doing to alleviate environmental problems around the lake?
3. Fish resources of the Lake are being affected by agricultural inputs (fertilizers, pesticides and chemicals) and effluents released into the lake so what is the Authority doing to solve this? For instance, by teaching farmers on how to manage utilization of agricultural inputs?
4. The Lake's volume of water is getting low because of the high extraction of water for various purposes and this inturn affects the fish resources as the breeding grounds are lost. Thus, what is the authority doing to ensure sustainable use of the Lake?

C. Themes of Discussion with Ziway town Administration

1. Is EIA conducted on projects around the Lake? Has the community been consulted before Sher Ethiopia was established? Does the city administration follow up whether these floriculture and horticulture activities are complying with EIA laws?
2. Is the town's administration discharging its duties in ensuring a clean and the healthy environment to the local community?
3. EBC and OBN and other media outlets reported that residents of Ziway town were being affected of typhoid, typhus and gastric problems after drinking water that is contaminated by chemical. What is the town's administration doing to ensure the health of the residents?
4. Why did the town's administration decide to install drinking water from Bulbula town, 30 killo meters far from Ziway? Is that because Lake Ziway became unusable for drinking purpose because of contamination?

D. Themes of Discussion with Castel Winery

1. Challenges in environmental compliance
 - a) Safeguards against environmental harm by chemicals and pesticides
 - b) Waste disposal
2. Have you conducted EIA before your company was established? If yes, how was the report of the EIA study?

3. Do experts from EPA regularly monitor your compliance with environmental standards?

E. Themes of Discussion with Sher Ethiopia

1. Do you release chemical effluents into the lake without treating them? Or how do you treat waste before they are released to the lake?
2. What type of chemicals and fertilizers or pesticides you use?
3. Have you conducted EIA before your company was established? If yes, how was the report of the EIA study?
4. Challenges in environmental compliance
 - a) Safeguards against environmental harm by chemicals and pesticides
 - b) Waste disposal
5. Do you have artificial wetland systems in all of your share companies?
6. Do experts from EPA regularly monitor your compliance with environmental standards?
7. Because of chemical effluents released by Sher Ethiopia into Lake Ziway in 2003, there was mass mortality of fishes. And what measures have you taken after that?

F. Themes of discussion with fishermen

1. Personal Information
 - A. Name _____
 - B. Sex _____
 - C. Age _____
2. Marital status of the respondent
 - Single _____
 - Married _____
3. Number of dependents _____?
4. What is the role of fishing?
 - A. Only for consumption _____
 - B. Only for sale _____
 - C. Both for sale and consumption _____
5. Do you have other means of livelihood? If Yes, what type? _____

6. Do you have any other means of livelihood if the lake is closed for two years?

7. Thinking about the catches when you first became involved with fishing compared with the catches now:
 - A. Increased _____
 - B. Decreased _____
 - C. Stay the same _____

8. What is the reason for the recent decline in fish production? _____

9. Do you have license to fish? _____
10. Are you using the legally permissible nets and fishing gears? _____
11. Does the Oromia Agricultural Research Institute Batu Fishery and other Aquatic Life Research Center control your equipment's and activities regularly? _____

G. Themes of Discussion with Oromia Environmental, Forest, and Climate Change Protection Authority?

1. Is EIA study conducted on projects around Lake Ziway shore? if yes, Are EIA evaluation and monitoring mechanisms undertaken on projects found around Lake Ziway Shore adequate? Has the local community participated in the EIA report?
2. Does Oromia Environmental, Forest, and Climate Change Protection Authority repetitive follow up and assess the horticulture and floriculture activities around Lake Ziway?
3. There are a number of researches and media reports that floriculture activities around lake Ziway are causing environmental and health concerns for Ziway community so what is your authority doing to alleviate the problems.