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ADDIS ABABA UNIVERSITY

COLLEGE OF DEVELOPMENT STUDIES

**NOISE POLLUTION AND THE ENFORCEMENT OF
ENVIRONMENTAL LAWS IN ADDIS ABABA: THE PRACTICE
AND CHALLENGES**

BY

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February 2020

Addis Ababa

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COLLEGE OF DEVELOPMENT STUDIE**

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**A thesis Submitted to College of Development Studies of Addis Ababa
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Master of Arts in Environment and Sustainable Developments**

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This is to certify that the thesis prepared by Mekonnen Shibeshi entitled: Noise pollution and the enforcement of environmental laws in Addis Ababa: the practice and challenges submitted in partial fulfillment of Master's Degree of Art in Environment and Sustainable Development complies with the regulations of the University and meets the standards with respect to originality and quality.

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Declaration

I, the undersigned, declare that this thesis work is my original work carried out by me. All the resources and materials used for this thesis have been fully acknowledged.

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Acronyms

AAEPA: Addis Ababa Environmental protection Authority

EFCCC: Environment Forest and Climate Change Commission

FDRE: Federal Democratic Republic Ethiopia

FEPA: Federal environment protection authority

SCEPO: Sub City Environment Protection Office

EIA: Environmental Impact Assessment

EMS: Environmental Management System

WHO: World Health Organization

UNDP: United Nations Development Programme

EC : European Commission

UNEP: United Nations Environment program

OECD: Organization for Economic Co-operation and Development

IGAD: Intergovernmental Authority on Development

Abstract

Nowadays, along with air and water pollution; noise pollution also hits the public life and creates problems to the normal life. Noise: which implies to 'unwanted sound' or 'sound that is loud, unpleasant or unexpected, has an impact on human health and environment. According to WHO standards, noise level beyond 90 decibel damages to health and ontological (ear diseases) effects. It is a distracter that prohibits us from performing at optimum ability, reduces the quality of life, and in cases, it may cause irreversible loss of hearing. The primary objective of this study is to assess the main sources and impacts of noise pollution and examine the implementation of environmental pollution control laws in Addis Ababa. The central issues of this study is identifying whether the regulatory organs regulating noise pollutions are properly enforcing the relevant laws or not.

The subjects of this study were environmental experts those working under the regulatory organs at various governmental levels including those working in Federal FECCC, AAEPa and each sub city environmental protection office in Addis Ababa. Data were collected by using a structured survey questionnaire and analyzed by descriptive methods. The findings of the study show that different sources have contributed for generation of noise pollution. These include: noise level generated from night clubs, bar, restaurants, religious places, industry, vehicles and so on so forth. The findings also indicate that the noise level released from night clubs, bar and restaurants are beyond the permitted standards. Sounds released from religious places with microphone are very high and noisy. But most of the complaints are associated to night clubs, bar and restaurants. The regulatory organs take only the administrative measures such as giving of warning notice sealing, relocating and so forth. No polluters brought to the court either in civil or criminal suit based on environmental pollution control proclamation number 300/2002 or criminal law of Ethiopia's the results of this study have shown.

Keywords: Sound, Noise, Noise pollution, sources of noise, effect of noise

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the study

Environmental pollution is one of the most serious problems facing humanity and other life forms on our planet today. Environmental pollution is defined as the contamination of the physical and biological components of the earth/atmosphere system to such an extent that normal environmental processes are adversely affected (Kumar, 2015).

The word “Pollution” is defined as: ‘any condition which is hazardous or potentially hazardous to human health, safety, or welfare or to living things created by altering any physical, radioactive, thermal, chemical, biological or other property of any part of the environment in contravention of any condition, limitation or restriction made under that proclamation or under any other relevant law (EPA 2002). Pollutants can be naturally occurring substances, but they are considered contaminants when in excess of natural levels. Any use of natural resources at a rate higher than nature’s capacity to restore itself can result in pollution of air, water, and land.

Depending on the nature of pollutants and also subsequent pollution of environmental components, the pollution may be categorized as follows: air pollution, water pollution, soil/land pollution, noise pollution, radioactive pollution and thermal pollution (Hoyt, 2019).

The word noise is derived from the Latin word “nausea” implying ‘unwanted sound’ or ‘sound that is loud, unpleasant or unexpected (Stephen A Stansfeld, 2003). Environmental noise pollution, a form of air pollution, is a threat to health and well-being. It is more severe and widespread than ever before, and it will continue to increase in magnitude and severity (Lisa Goines, 2007).

Noise has an impact on human health and environment. According to WHO standards, noise level beyond 90 decibel damages to health and ontological (ear diseases) effects. It is a distracter that prohibits us from performing at optimum ability, reduces the quality of life, and in cases, it may cause irreversible loss of hearing. The right to live in clean and healthy environment is clearly articulated under FDRE’s constitution and environmental policy of Ethiopia.

Environmental regulatory bodies have been established at federal, regional and city and sub city levels to manage environmental problems. Besides, several rules and regulations have been promulgated to control pollutions in Addis Ababa city. These include: Environmental Protection Organs establishment proclamation No.295/2002, Environmental Impact Assessment proclamation No.299/2002, Environmental Control proclamation No.300/2002, Solid Waste Management proclamation 513/2007 and various specific regulations are proclaimed with purpose of controlling and protecting of environmental pollutions. Environmental pollution emission limit standards for different sectors such as standards for specified industrial sectors, general standards for all other industrial effluents, standards for all other industrial gaseous emissions and standards for noise limits are stotted.

As we can observe the current situations of Addis Ababa the community living in the city is suffering from the noise pollution of loud speakers of the religious institutions, live musical beat of night clubs, bars and restaurants, dance and shouting at midnight, the obsolete trucks and automobiles fumes on the ring roads, the landing and takeoff air plane stiff noise and the like.

Among different types of pollution, noise pollution, which emanates from different sources, is singled out in this study for three main reasons. First, noise pollution is one of the salient features of Addis Ababa due to incomplete enforcement of environmental pollution control laws. Second, the community and also the environmental inspectors do not have basic knowledge about the impacts of noise pollution on human health and environment. As a result the releasing of noise pollution from different sources is increasing from time to time. The other top reason is that the communities in general do not have adequate awareness about the existence of harsh and rigorous imprisonment in violating of environmental laws.

It is, therefore, imperative to identify the sources and impacts of noise pollution and to investigate the implementation of environmental laws in noise pollution controls in the city of Addis Ababa. This study is an attempt in this regard.

1.2. Statement of the Problem

In their day to day life, residents of Addis Ababa witness the releasing of pollutants to the environment without any care. People always bring complaints especially on noise pollution to

the Addis Ababa Environmental Protection Authority (here after referred as AAEPA) and sub city environmental protection offices to get solutions to the noisy sound released from different sources. The core point of this study is examining the actions of regulatory bodies to redress noise pollutions and thereby, identify the practices, challenges and management of noise pollution in the city of Addis Ababa.

Different researchers tried to address the issues of noise pollution in Addis Ababa with different perspectives. For instance, Dana (2017), assessed noise pollution in Addis Ababa city by taking Bole Michael Community Area as a case study (Doda, 2017). This research assessed the levels of noise pollution that severely affect the lives of the community and the major impacts do the community faces. But this study did not assess critically the gaps in the implementation of environmental laws. Another study by Zenith (2014), focused on identifying the source of noise in school environment and determined the noise pollution level in the class room and outside the class room; the effects of noise on the learning and teaching processes in the class room were identified and compared with the measured noise level with the Addis Ababa city noise standard and international standard in this study (Kucha, 2014). However, the power to control and taking administrative measures given by the law to the regulatory organs are not discussed under this study.

Yonas (2018), evaluated road traffic noise pollution in some selected areas of Addis Ababa. This study deals with only traffic noise pollution (Endale, 2018). The other sources of noise pollution such as night clubs, religious places bar and restaurants are overlooked in this study.

In general, the prior studies on noise pollution did not address the types of legal remedies and penalties inflicted up on the polluters based on the environmental pollution controls proclamation No.300/2002 and criminal code of Ethiopia.

Therefore this study mainly focuses on the implementation of environmental pollution controls proclamation No.300/2002 and criminal code of Ethiopia on noise pollution. The environmental pollution controls proclamation provides strong powers to the regulatory organs to take administrative measures up to closing and relocating the entity. The proclamation also guarantees the right to individual citizen to frame suits on polluters without needed to show

vested interest. These all issues are not touched in the aforementioned studies. Therefore this study fills in such research gaps in prior studies by identifying the gaps and providing solutions in the enforcements of environmental laws in controlling noise pollutions

1.3. Objectives of the study

The main objective of this study is to assess the practices and challenges in the implementation of environmental pollution control laws in Addis Ababa. Specifically, the study attempts to address the following objectives;

1. To describe the existing status of noise pollution in Addis Ababa.
2. To assess the institutional capacity of the regulatory organs to control noise pollution
3. To examine the practices on the application of environmental laws related with noise pollution controls
4. To examine the challenges related with the application of environmental laws to control noise pollution in Addis Ababa city.

1.4. Research questions

- What does the current situation of noise pollution look like in Addis Ababa?
- Do the environmental regulatory organs enforce environmental laws and standards properly to control noise pollutions in Addis Ababa?
- What does the practice of the regulatory organs look like to control noise pollution?
- What are the challenges in enforcing noise pollution control in Addis Ababa city?

1.5. Significance of the study

This study is expected to be useful in three main points. First, the study will contribute to a better theoretical understanding of the overall features of noise pollution and problems faced in the process of noise pollution controls. Second, the results of the study provide some information to policy makers, public administrators and, environmental pollution regulators to effectively

implement the existing laws and regulations related with noise pollution control. The study is also believed to provide some baseline information to the next work as a springboard for researchers who would like to conduct detailed and comprehensive studies either in the city or another study area.

1.6 Scope of the Study

In terms of its focus area, this study is limited to assess the existing situations of noise pollution in Addis Ababa and the enforcement of environmental laws. Although the knowledge and experiences of the households and other stakeholders regarding the existing situations of noise pollutions and the enforcement of environmental laws are subject to study, this study is confined to the environmental experts those working in the regulatory organs in the city of Addis Ababa due to financial and time constraints.

1.7 . Limitation of the study

The data and information collected by questioners and check lists are only from the regulatory institutions. The perception of the community about the existing situation of Addis Ababa in relation to noise pollution is not assessed. This is the main limitation of this paper. Lack of secondary data, financial shortage during data collection and respondents refusal to provide detailed information are another limitation of this paper. Despite such challenges, the researcher has tried to minimize these problems and come up with reasonable findings.

1.8. Organization of the Paper

The core body of the research is organized in five chapters. The first chapter, which is the introductory unit, is composed of background of the study, description of the study area, statement of the problem, research question, objectives of the study, Significances of the study, scope of the study and limitations. The materials referred are presented under the second chapter. Chapter 2 presents the definition of basic terms and concepts about; environment, environmental pollution and related concepts, theory and components of environmental governance, environmental law and accepted Principles, environmental policy and legal frame works of Ethiopia. The issue of criminal and civil liability of the polluters reviewed under this chapter.

The central part of the research work, methodology, is found under the third chapter. Explanations referring the description of the study area in terms of the physical, demographic and livelihood aspects, justification for selection of the area for the research, and the study design are the components built this chapter up. Points regarding the sample and sampling techniques, the data collection mechanisms are also the other parts in the chapter.

Chapter four is the area where the findings of the study are discussed in different parts and forms followed by the last section of the main body of the paper (chapter five) showing the profound conclusions and remedies for further concerns.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. An overview of Environment, Environmental pollution and related concepts

2.1.1 Environment

Environment is everything that is around us; it can be living or non-living things. It includes physical, chemical and other natural forces. Environment includes the living and nonliving things that an organism interacts with, or has an effect on it. Living elements that an organism interacts with are known as biotic elements: animals, plants, etc., abiotic elements are non-living which include air, water, sunlight etc. Studying the environment means studying the relationships among these various things. An example of interactions between non-living and living things is plants getting their minerals from the soil and making food using sunlight. Predation, an organism eating another, is an example of interaction between living things.

Environment is something you are very familiar with. It's everything that makes up our surroundings and affects our ability to live on the earth; the air we breathe, the water that covers most of the earth's surface, the plants and animals around us, and much more (factmonster, 2018).

2.1.2. Urban Environmental problems

Rapid urban change need not produce serious environmental problems. However, environmental problems become particularly serious where there is a rapid expansion in urban population and production with little or no consideration either for the environmental implications or for the political and institutional framework that is needed to ensure that such environmental problems are addressed (David , G. and B, 2013). In low and middle income countries, the expansion in their urban population has occurred without the needed expansion in the services and facilities that are essential to an adequate and healthy urban environment (Fawzi, 2017).

It has usually occurred with little or no effective pollution control, and with forms of urban governance that cannot begin to meet their multiple responsibilities. It has also taken place with little regard to the environmental implications of rapid urban expansion, including the modifications to the earth's surface and to the local ecology, the changes wrought in the natural flows of water, and the demands made on the surrounding region for building materials as a result of the construction of buildings, roads, car-parks, industries and other components of the urban fabric (Capacity 4 dev.eu, 2015).

Urban expansion without effective urban governance means that a substantial proportion of the population faces high levels of risk from natural and human-induced environmental hazards (Jorge E, 2010). This can be seen in most major cities in Africa, Asia and Latin America, where a significant proportion of the population lives in shelters and neighborhoods with very inadequate provision for water and the safe disposal of solid and liquid wastes.

Generally; urban environmental problems defines as the degradation of urban water, air and land excludes many of the environmental health problems suffered predominantly by the poor, as well as the extra-urban impacts that threaten regional and global sustainability. Urban environmental problems includes the health problems such as inadequate household water and sanitation and indoor air pollution; ambient air pollution, inadequate waste management and pollution of rivers, lakes and coastal areas, urban activities such as ecological disruption and resource depletion in a city's hinterland, and emissions of acid precursors and greenhouse gases and regional or global environmental burdens that arise from activities outside a city's boundaries, but which will affect people living in the city (United Nations Development Programme (UNDP) and the European Commission (EC), 2000).

The creation of adequate conditions for healthy living of the people is dependent on natural environment. Once it is disrupted by human activities; possibilities of healthy living become quite difficult. The global concern for environmental protection found expression in UN Conference on Human Environment held at Stockholm in 1972. In pursuance thereof United Nations Environment program me (UNEP) was established to carry out its policies for environmental protection within the framework of United Nations. Further, a common

responsibility of the member states for protecting and preserving environment has also been created under Article 30 of the Charter of Economic Rights and Duties of the States. It reads: “the protection, preservation and enhancement of environment for the present and future generations is the responsibility of the states. All the states shall endeavor to establish their own environmental and developmental policies in conformity with such responsibility.”

2.1.4. Environmental Pollution

Organization for Economic Co-operation and Development (**OECD**) has suggested the following as a general definition of pollution: the introduction by humankind, directly or indirectly, of substances or energy into the environment resulting in deleterious effects of such a nature as to endanger human health, harm living resources and eco-systems, impair amenities or interfere with other legitimate uses of the environment (IGAD , 2016). Environment is an aggregate of all external conditions and influences affecting the life and development of an organism. Once it is disturbed, no better living conditions for human beings can be created. To make the enjoyment of life more meaningful, the preservation and protection of natural environment must be given priority and the human activities causing ecological imbalance must be within the ambit of sustainable development (Kumara , 2014). Depending on the nature of pollutants and also subsequent pollution of environmental components, the pollution may be categorized as follows: air pollution, water pollution, soil/land pollution, noise pollution, radioactive pollution and thermal pollution.

2.1.4.1. Air pollution

Air pollution is a mixture of solid particles and gases in the air. Car emissions, chemicals from factories, dust and pollen and mold spores may be suspended as particles. Ozone, a gas, is a major part of air pollution in cities. When ozone forms air pollution, it's also called smog. Air pollution occurs when harmful or excessive quantities of substances including gases, particulates, and biological molecules are introduced into Earth's atmosphere (MedlinePlus, 2018). Some air pollutants are poisonous. Inhaling them can increase the chance you'll have health problems. People with heart or lung disease, older adults and children are at greater risk from air pollution. Air pollution isn't just outside - the air inside buildings can also be polluted and affect your health.

Air pollution, release into the atmosphere of various gases, finely divided solids, or finely dispersed liquid aerosols at rates that exceed the natural capacity of the environment to dissipate and dilute or absorb them. These substances may reach concentrations in the air that cause undesirable health, economic, or aesthetic effects (Nathanson, 2018).

According to First World Health organization (WHO) Global Conference on Air Pollution and Health, 30 October – 1 November 2018, Geneva, declaration, as the world gets hotter and more crowded, our engines continue to pump out dirty emissions, and half the world has no access to clean fuels or technologies (e.g. stoves, lamps), the very air we breathe is growing dangerously polluted: nine out of ten people now breathe polluted air, which kills 7 million people every year. The health effects of air pollution are serious one third of deaths from stroke; lung cancer and heart disease are due to air pollution. This is an equivalent effect to that of smoking tobacco, and much higher than, say, the effects of eating too much salt (<https://www.who.int/airpollution/en/>, 2018).

Among other types of pollution, air pollution is the main type threatening the environment, humans, plants, animals, and all living organisms. Air pollution is hard to escape, no matter how rich an area you live in. It is all around us. Microscopic pollutants in the air can slip past our body's defenses, penetrating deep into our respiratory and circulatory system, damaging our lungs, heart and brain.

Depending on WHO 2018 conference declarations, 4.2 million deaths every year as a result of exposure to ambient (outdoor) air pollution, 3.8 million deaths every year as a result of household exposure to smoke from dirty cook stoves and fuels, 91% of the world's population lives in places where air quality exceeds WHO guideline limits.

The quality of air is now becoming a serious issue of cities. The death of 6.5 million people worldwide is linked with air pollution (Mekonnen et.al , 2018). The PM10, NO and other volatile organic carbon in urban air are found to be exceeded than WHO guideline limit.

The major sources of these pollutants in the city are transport, industries and other services like waste management and household energy. The rapid increase in urban population due to the natural causes and urbanization aggravate the issue in the developing country than the

industrialized world. The increased population of cities demand higher service sectors, transportation, industries and energy which in turn emit more air pollutants into the surrounding atmosphere.

In Ethiopia, the release of effluents by factories has until recently not been regulated. However, industries continue to release pollutants into the natural environment without any treatment, with serious health and social effects on those exposed to it (Aberra, 2018).

2.1.4.2. Water Pollution

Water pollution is any chemical, physical or biological change in the quality of water that has a harmful effect on any living thing that drinks or uses or lives in it (Lenntech, 2018). When humans drink polluted water it often has serious effects on their health. Water pollution can also make water unsuited for the desired use.

Water pollution is the contamination of water bodies, usually as a result of human activities. Water bodies include for example lakes, rivers, oceans, aquifers and groundwater (Lenntech, 2018). Water pollution results when contaminants are introduced into the natural environment.

Water pollution occurs when harmful substances often chemicals or microorganisms contaminate a stream, river, lake, ocean, aquifer, or other body of water, degrading water quality and rendering it toxic to humans or the environment (Denchak, 2018).

Addis Ababa is endowed with numerous seasonal and perennial small streams that flow to the little and great Akaki River, then feeding into the Awash basin and so forth into the lakes of the Rift Valley. As result of fast population growth, uncontrolled urbanization and industrialization and poor waste management practices Addis Ababa water resource highly polluted which threaten human health and ecosystem function as whole (Hamere et.al. , 2017). The rivers in Addis Ababa are simply used as a receptacle of all kinds of wastes released in the city. There is a high amount of waste disposal in the river and riverbanks from municipal source (municipal solid and liquid wastes), liquid wastes from toilet, open urination and defecation. Other waste sources come from construction buildings, fuel stations, garage operations and congested settlements. Addis Ababa hosts about 65% industries of the country and more than 90% of the industries discharge their waste to nearby river without proper treatment (Hamere et.al , 2017).

The main water resources that provide the city with water are Geferssa, Legedadi and Dire Dams having a combined daily production of 173,000 m³ (Gebre, G. and Van Rooijen, D.J., 2009). Two major rivers flow through the city, namely Tinishu Akaki (Little Akaki) and Tiliku Akaki (Great Akaki) Rivers. These rivers, which are tributaries of Awash River, originate from Entoto Mountains that are located north to Addis Ababa and flow to Aba Samuel Lake (43 km to the South). The rivers serve as drains for excessive storm water and the disposal of domestic and industrial waste water. Water from the rivers is being used for various purposes; irrigation, sand mining, industrial consumption, washing of materials, and bathing, cattle consumption and waste disposal.

Fast population growth and inadequate sanitation infrastructure are causing serious environment pollution problem in and around Addis Ababa. Discharge of untreated effluent from industries, solid wastes and waste water from households and institutions, are the major sources of pollution of the rivers flowing through the city. The main sources of pollution that enters urban surface water bodies are industries, municipal solid waste and oily wastes from garages and fuel stations. Due to the inadequacy of controlled waste management strategies and waste treatment plants, people are forced to discharge wastes both on open surface and within water bodies. There are over 2,000 registered industries in Addis Ababa (65 % of all industries in the country) most of them located along the river banks (Gebre et.al ., 2009). Uncontrolled (improper) waste disposal has deteriorated the quality of surface water (streams, rivers, reservoirs) by changing the chemical, physical and organoleptic properties of water. Chemical analyses of surface and shallow groundwater samples taken at various points along streams and different springs show that the level of unwanted chemical constituents such as nitrate and chromium, for example, are higher than the background level (SINET:Ethiopian Journal of Science, 2001). Based on the Slovak Technical Standard grade system (STN, 1998) and WHO drinking water guideline (2004), the water quality of the Little and Great Akaki river basins have been classified as badly polluted to very badly polluted water (Gebr and Van, 2009) . Empirical evidences shows that Water pollution due to fecal matter contamination and poor sanitation practice may be the major cause of the top ten leading causes of outpatient visit, hospital admission and death among children and elderly, in Ethiopia in general and Addis Ababa city in particular (Gebre and Van, 2009)

2.1.4.3. Soil/Land Pollution

Land pollution is a major problem around the world and is caused by a variety of factors. Some of the main causes of soil pollution include deforestation and consequent erosion, agriculture, industry, mining, landfills and illegal dumping of waste as well as urbanization and construction (Greentumble, 2018). Accordingly, land pollution is defined as a degradation or even destruction of the earth's surface and soil as a result of human activities.

Sources of soil pollution can be direct, for example, from dumping toxic chemicals directly on to a site, or indirect, for example where toxic chemicals leach through the soil from particulates that have settled from air pollution from a nearby lead smelter (Greentumble, 2018).

It can also simply be degradation from transforming the land by clearing it so that beneficial organisms can no longer provide services supporting growth and protect it from further erosion.

Soil contamination or soil pollution as part of land degradation is caused by the presence of chemicals or other alteration in the natural soil environment. It is typically caused by industrial activity, agricultural chemicals, or improper disposal of waste (Wikipedia, 2018,)

When we talk about air or water pollution, the reactions garnered are stronger. This is because we can see the effects caused by the pollutants and their extent very clearly. It is normal human psychology to believe in what you see firsthand. Our land on the other hand is living a nightmare too. We may not be able to see the effects with clarity, but land is being polluted and abused constantly and we are unable to calculate the damages incurred (Conserve Energy Future , 2018). Land Pollution has come to become one of the serious concerns that we collectively battle.

Land pollution, in other words, means degradation or destruction of earth's surface and soil, directly or indirectly as a result of human activities. Anthropogenic activities are conducted citing development, and the same affects the land drastically, we witness land pollution; by drastic we are referring to any activity that lessens the quality and/or productivity of the land as an ideal place for agriculture, forestation, construction etc. The degradation of land that could be used constructively in other words is land pollution.

Land Pollution has led to a series of issues that we have come to realize in recent times, after decades of neglect. The increasing numbers of barren land plots and the decreasing numbers of forest cover is at an alarming ratio (Conserve Energy Future , 2018). Moreover the extension of cities and towns due to increasing population is leading to further exploitation of the land. Landfills and reclamations are being planned and executed to meet the increased demand of lands. This leads to further deterioration of land, and pollution caused by the land fill contents. Also due to the lack of green cover, the land gets affected in several ways like soil erosion occurs washing away the fertile portions of the land. Deforestation and soil erosion, agricultural and mining activities, overcrowded landfills, industrialization, construction activities, nuclear waste and sewage treatment are the causes of land pollutions.

2.1.4.5. Radioactive Pollution

Radioactive pollution refers to the release of ionizing radiation into the environment as a result of human activity (Study.com, 2018). Ionizing radiation is the form of radiation that has a short wavelength and a high frequency. In short, it's the form of radiation that's commonly thought of as being high energy and thus harmful to living things. Ionizing radiation includes x-rays and gamma rays.

Improperly handled material used in nuclear medicine is possible radioactive pollutant. Actually, even medical x-rays are technically a source of radioactive pollution, as some x-rays scatter into the environment after the x-ray is taken (Study.com, 2018). In fact, nuclear medicine and x-rays are the two prevalent types of radioactive pollution affecting most people today. You should be more worried about them than you should be about the fallout from a nuclear power plant unless, of course, you live near one. That being said, however, when such medical diagnostic and treatment techniques are used properly they are considered to be quite safe! Some people believe that radioactive pollution also includes radon gas, which naturally comes up from underground. In that case, the major cause of radioactive pollution is radon gas, not medicine (Study.com, 2018).

The consequences of radioactive pollution can be highly varied. It all depends on the source of the radioactive pollution, the amount of exposure, and the duration of exposure. For instance, taking an x-ray once in your life is extremely unlikely to result in any noticeable damage to your body now or in the future. On the other extreme end of things, exposure to very high levels of

high-energy radiation all at once, such as from a nuclear bomb, can kill you very quickly. Exposure to higher than normal levels of radiation (but not extremely high) over a long period of time can increase your risk for all sorts of cancer types (Study.com, 2018).

2.1.4.6. Thermal Pollution

Thermal pollution is defined as sudden increase or decrease in temperature of a natural body of water which may be ocean, lake, river or pond by human influence (Conserve Energy Future , 2018). This normally occurs when a plant or facility takes in water from a natural resource and puts it back with an altered temperature. Usually, these facilities use it as a cooling method for their machinery or to help better produce their products. Plants that produce different products or waste water facilities are often the culprits of this massive exodus of thermal pollution. In order to properly control and maintain thermal pollution, humans and governments have been taking many steps to effectively manage how plants are able to use the water.

2.3. Noise Pollution

The word noise is derived from the Latin word, nausea, meaning seasickness (zerihun, 2017). Noise means wrong sound in the wrong place at the wrong time (Kiely, 2011). Noise pollution may be defined as unwanted sound which gets damped into the atmosphere without regarding the adverse effects it may have. Noise is an unwanted sound that creates annoyance and interferes in conversation, disturbs sleep and the teaching-learning process, reduces work efficiency, causing stress and challenges the public health.

Noise by definition is unwanted sound. Sound that is unwanted or disrupts one's quality of life is called as noise. When there is a lot of noise in the environment beyond certain limit, it is termed as noise pollution (Kumara, 2014). Sound becomes undesirable when it disturbs the normal activities such as working, sleeping, and during conversations. It is an underrated environmental problem because of the fact that it can't be seen, smelt, or tasted (Dasarathy, 2015). A more precise definition could be: noise is audible sound that causes disturbance, impairment or health damage.

Environmental noise is considered to be any unwanted sounds created by human activity (Drew, 2017). Environmental noise includes noise from roads, rail and air, as well as construction noise,

music systems (amplified sound), neighbors, small machinery and air conditioners. This makes it an important issue for densely populated urban environments. This definition allows for environmental noise to be considered a type of pollution, an element that can be regulated, controlled and mitigated.

By definition, noise pollution takes place when there is either excessive amount of noise or an unpleasant sound that causes temporary disruption in the natural balance (Conserve Energy Future , 2018). This definition is usually applicable to sounds or noises that are unnatural in either their volume or their production. Noise pollution takes place when there is either excessive amount of noise or an unpleasant sound that causes temporary disruption in the natural balance (Patrick, 2016). Noise pollution can be defined as any disturbing or unwanted noise that interferes or harms humans or wildlife. Although noise constantly surrounds us, noise pollution generally receives less attention than water quality and air quality issues because it cannot be seen, tasted, or smelled.

Industrialization, poor urban planning, social and religious events, transportation, construction activities and house hold chores are causes of noise pollution. Hearing problems, health issues, sleeping disorders, cardiovascular issues, trouble communicating and unsuitability on wildlife are the effects of noise pollution (Conserve Energy Future, 2018).

Urban noise pollution is one of the problems of the people who live in urban area and it is a cause of health and social problem. In various studies and surveys on the quality of urban life, noise is placed in the forefront of inconveniences and discomfort list (Maria, 2015). The frequencies of limits of audibility are from 20 to 20000 Hz (Belay, 2017). The sources of noise are traffic noise such as vehicles, train, plane, loudspeaker, music shop, etc. One of the serious and the most often unnoticed issues in environmental pollution is traffic noise. In many countries, road traffic is the most widespread sources of noise. Recent evidence suggests that noise pollution may be a contributing factor to high blood pressure, anxiety and nervousness (Belay, 2017).

Urbanization and associated growth in mobility and industrialization have resulted in the intensification of noise in densely populated areas causing an increase in noise exposure. As the

population increases in an urban area, industrial activities also increase to meet people's needs; this result increased the noise levels. Noise pollution is a growing problem in today's urban centers. Noise is a manifestation of air quality deterioration, and therefore its impacts on social and personal liberties of an individual are to be recognized as cognizable offence. Noise as a pollutant produces contaminated environment that serves as a nuisance affecting human health, their activities and mental abilities (Kumara, 2014). So, noise pollution may be defined as an act of dumping unwanted sound into the atmosphere without heeding to its adverse effects on human or animal kind. It may be considered as a by-product of the concentrated use of power or energy. Noise is a type of pollution and impacts on our health and wellness. The prevalence of noise is increasing in magnitude and severity because of urban life style and no or bad governance of noise (Ahmed, 2018).

2.3.1. Noise Measurement

The decibel is a widely used unit of sound measurement and represents a logarithmic ratio of the power of the sound relative to the power at the threshold of human hearing. Noise is measured in terms of its frequency as well as intensity of sound; the dB (a) weights sounds in the audible range of humans (Bhatia, 2014).

2.3.2 Impacts of noise pollution on the environment

An increasing number of studies indicate that wildlife is stressed by noise pollution causing a variety of impacts on the environment by disturbing mammal, bird and fish feeding and breeding patterns. According to the National Park Service, these effects are compounded by other stressors including disease and extreme weather (Meckay, 2010).

Impact of noise on the environment can be explained by reduction of usable animal life habitat due to noise increase, which in the case of endangered species may be part of the path to extinction (Mahelet, 2009). In addition, noise can harm animals and the environment, as well as physical property. Livestock and pets are harmed by noise, as are animals in the wild. Noise can also disturb wildlife feeding and breeding. Noise-related property damage includes structural damage from vibrations induced by sound waves and economic harm in the form of lower property values. The true social costs of noise pollution also must include monetary losses from

sickness, absenteeism, loss of productivity and earning capacity, and much more (Smelser and Balter, 2009).

2.3.3 Impacts of noise pollution on human health

Chronic exposure to noise, including daytime traffic is strongly associated with disease and premature death. Long term exposure to noise levels above 75 decibels seriously hampers hearing and affects human physical and psychological well-being (Rodrigue, 2017). At 120 decibels the ear registers pain, but hearing damage begins at a much lower level, about 85 decibels (Jamir L, 2014). Noise pollution can affect both health and behavior in nature. It can contribute to cardiovascular effects, and exposure to moderately high levels during a single eight hour period causes a statistical rise in blood pressure of five to ten points and an increase in stress and vasoconstriction leading to the increased blood pressure noted above, as well as to increased incidence of coronary artery disease (Kelly Drew, 2017).

Noise is associated with the mental, physical, emotional and psychological well-being of an individual. The damaging effects of noise from various natural and man-made sources are potential hazards that need to be checked at the planning, administrative and judicial levels.

Noise annoys, distracts, disturbs, and when exposure to it is sustained, it may cause physiological effects leading to loss of hearing and apart from psychological distresses (Kumara, 2014). Prolonged exposure to intense noise may cause permanent loss of hearing leading to deafness. Annoyance results from interferences in sleep and conversation. At home, noise may cause disturbance and loss of privacy. At workplace, it reduces Productivity, efficiency, accuracy and safety. While high levels of noise are always objectionable, noise at very low levels under certain circumstances can be objectionable when it causes interference with normal conversation, hinder concentrated mental effort, induce stress, causes inefficiency at work, disturbs sleep, causes irritation, and interfere with relaxation and recreation.

There is increasing concern about the impacts of environmental noise on health, especially in urban areas. The growing body of evidence indicates that exposure to excessive environmental noise does not only impact quality of life and cause hearing loss but also has other health

impacts, such as cardiovascular effects, cognitive impacts, sleep disturbance and mental health effects (Kelly Drew, 2017).

According to World Health Organization (WHO), noise pollution is a serious threat to human's health. The organization on its webpage lists the following negative effects of unwanted sounds on health (WHO, 2018):

- Pain and hearing fatigue;
- Hearing impairment including tinnitus;
- Annoyance;
- Interferences with social behavior (aggressiveness, protest and helplessness);
- Interference with speech communication;
- Sleep disturbance and all its consequences on a long and short term basis;
- Cardiovascular effects;
- Hormonal responses (stress hormones) and their possible consequences on human metabolism (nutrition) and immune system;

The relation of noise pollution level and its harmful effects are shown in the table below.

Table 2.1 Noise pollution level and its harmful effects

No	Level (in db)	Effect
1	up to 23	No disturbance
2	30----60	Stress, tension, psychological (illness, heart attack) effects especially at upper range
3	60-----90	Damage to health, psychological and vegetative (disturbance in stomach-gall function, pains in muscles, high blood pressure, disturbance in sleeping)
4	90----120	Damages to health and ontological (ear diseases) effects
5	Above 120	Painful effects in long run.

Adapted from: Puja Mondal, (2014)

2.4 Noise pollution in Addis Ababa

Noise pollution in Addis Ababa had reached a limit where it was enough to call for proper attention from all concerned bodies. Without denying the many positive changes in Addis Ababa in the past few years, no one can escape the extent to which the amount of pollution of all kinds seems to be intensifying in all parts of the city (Meron , 2012). Still, out of control sound blasting from religious institutions, transport vehicles, industrial plants, construction sites, nightclubs and bars, and music shops, to mention few, are threatening to turn the political capital of the continent Africa into a pandemonium of auditory anguish (Yibeltal, 2014).

Because the competition between Churches and Mosques is also so rife, the loudspeakers come in handy to win the battle. In big cities, especially in Addis, the condition is worse. Having a house next to a church or a mosque is a nightmare (Patrick, 2016). In addition to Churches and Mosques, vehicles are other noise polluters. It is almost impossible to have a peaceful, undisturbed day walking in the streets. Figure 1 shows the release of noise pollution by using loud speakers from different sources.



Figure 1: Noise pollution by loud speaker

Adapted from: the Ethiopian Herald April 21/2019

Studies have shown that road and air transportation, manufacturing, music shops, dogs, night clubs, sound advertisements and religious institutions are categorized as the major sound pollutants (Abebe,2019). Although the standards are not county specific and not formulated based on studying the country's noise, there are specified decibels (dB) for commercial, industrial and residential areas for day and night time. The numbers seem higher than some other countries, which show that Ethiopia tolerates noise (Mintesnot, 2018). Even with the generous standards many places exceed the noise level. According to Mintesnot, (2018), a study by Mekonen and Leta which was published on International Journal of Environmental Science in 2014 showed that in 20 selected places in Mercato open market, the maximum observed value is 102.6 decibel (with the average range from 61.7 to 83.9 decibel).



Figure 2: Noise pollution in Merkato area.

Adapted from: the Ezega News June 4,/2012

According to their analysis, the noise level at 19 of the 20 locations exceeded the recommended limit of 65 decibel for commercial places. This may cause unobservable health problem, especially for those who are exposed to such noises for long period of time.

2.5. Environmental pollutions governance.

In our globalized world of interconnected nations, economies and people, managing environmental threats, particularly those that cross political borders such as air pollution and biodiversity loss, will require new global, regional, national and local responses involving a wide range of stakeholders (UNEP, 2009).

Effective environmental governance at all levels is critical for finding solutions to these challenges. Environmental Governance comprises the rules, practices, policies and institutions that shape how humans interact with the environment.

Good environmental governance takes into account the role of all actors that impact the environment. From governments to NGOs, the private sector and civil society, cooperation is critical to achieving effective governance that can help us move towards a more sustainable future.

The lexical meaning of the term 'governance' signifies the actions or conduct of an administration, its management practices and systems of regulation (Yoshida, 2012). Environmental governance simply means a structure that enables society to manage the environment, just as a conductor unifies and adjusts the overall performance of an orchestra (Yoshida, 2012). It is thus useful to place the theory of "governance" within the domain of environmental economics as it searches for an analysis that will provide a concrete policy structure for the environmentally sensitive conservation society. Environmental governance is realized when a variety of actors use various tools to work actively through interrelationships and interchange to plan and operate a regime based on the aim of conserving the environment, at a time when the problems that affect the environment are spreading into more and more areas.

The theory of environmental governance entails that a society which is composed of the government, the community as a whole, businesses and the individual person will negotiate together about such environmental measures as the Kyoto Protocol, reach an agreement,

establish a criterion, devise a workable structure of environmental regulations, and have the necessary authority to carry out their provisions (Yoshida, 2012). Environmental governance refers to the processes of decision-making involved in the control and management of the environment and natural resources.

2.6. Legal frameworks on environmental issues in Ethiopia

2.6.1. The 1995 FDRE Constitution

The 1995 Constitution of the Federal Democratic Republic of Ethiopia and the National Economic Policy and Strategy have recognized and given due attention to environmental protection. The overall policy 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 and human-made resources and the environment.

These positive Constitutional and policy concepts however, have not been matched by appropriate institutions to give them life, as it were. Theoretically, there is less difficult which will be Article 44 of FDRE Constitution on the title “Environmental Rights” proclaim as follows;

Article 44(1) declares that, “All Persons have the right to a clean and healthy environment”.

Article 92 of the same Constitution proclaims the general ‘Environmental Objectives’ of Ethiopia as follows;

Article 92(1); “ Government shall endeavor to ensure that all Ethiopians live in a clean and healthy environment”.

Article 92(2); “the design and implementation of programs and projects of development shall not damage or destroy the environment”.

Article 92(3); “People have the right to full consultation and to the expression of views in the planning and implementation of environmental policies and projects that affect them directly”.

Article 92(4); ‘‘Government and citizens shall have the duty to protect the environment’’. Based on this article both the Federal and Regional government and the people of Ethiopia shall have a joint and a several duty to protect the global and regional environment.

2.6.2. The 1997 Environmental Policy of Ethiopia

The overall policy goal is to improve and enhance to a clean and healthy environment for all Ethiopians and to promote sustainable social and economic development through the sound management and use of natural and human-made 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. The 1997 environmental policy of Ethiopia illustrate specific objectives and guiding principles. One of the specific objectives of the environmental policy of Ethiopia is preventing the pollution of the atmosphere, plants, land, water and aquatic life in the most cost- effective way. Every person has the right to live in a clean and healthy environment is incorporated as the main guiding principles of the policy.

2.7. Proclamations Related to Environmental Pollution Controls

In now day’s environmental issues are incorporated almost in all proclamations for different reasons. But there are some proclamations proclaimed for the sole purpose of environmental protection.

These are:-Environmental Pollution Controls proclamation (No.300/2002), Environmental Impact Assessment proclamation (No, 299/2002) and Solid waste management Proclamation (513/2007).

Environmental Pollution Controls proclamation (No, 300/2002), specify that in consultation with competent agencies, the environmental regulatory body shall formulate practicable environmental standards based on scientific and environmental principles. The sectors that require standards identified as the following:

- (a) Standards for the discharge of effluents into water bodies and sewage systems.
- (b) Air quality standards that specify the ambient air quality and give the allowable amounts of emission for both stationary and mobile air pollution sources.

(c) Standards for the types and amounts of substances that can be applied to the soil or be disposed of on or in it.

(d) Standards for noise providing for the maximum allowable noise level taking into account the settlement patterns and the availability of scientific and technological capacity in the country.

(e) Waste management standards specifying the levels allowed and the methods to be used in the generation, handling, storage, treatment, transport and disposal of the various types of waste. According to the pollution proclamation (No, 300/2002), regional states may, based on their specific situation, adopt environmental standards that are more stringent than those determined at the Federal level. However, they shall not adopt standards which are less rigorous than those determined at the Federal level. The Authority may, for a fixed period of time, authorize the waiver of the duty to comply with some requirements of specified environmental standards in order to promote public benefit.

Based on the Environmental Impact Assessment proclamation (No, 299/2002) article 3/1, without authorization from the Authority or from the relevant regional environmental agency, no person shall commence implementation of any project that requires environmental impact assessment as determined in a directive issued pursuant to Article 5 of this Proclamation.

According to article 7/1&2/ of the proclamation; a proponent shall undertake an environmental impact assessment, identify the likely adverse impacts of his project, incorporated the means of their prevention or containment, and submit to the Authority or the relevant regional environmental agency the environmental impact study report together with the documents determined as necessary by the Authority or the relevant regional environmental agency. A proponent shall ensure that the environmental impact of his project is conducted and the environmental impact study report prepared by experts that meet the requirements specified under any directive issued by the Authority.

2.8 Environmental standards

The Environmental Protection Organs Establishment Proclamation No. 29512002; article 9/3 declare that the environmental council has the responsibility to approve environmental standards.

Based on this provision; the standards are presented in four categories approved by the environmental council as follows:

- Standards for Specified Industrial Sectors
- General Standards for all other Industrial Effluents
- Standards for all other Industrial Gaseous Emissions
- Standards for Noise Limits.

2.9 Standards for Noise emission Limits.

Noise is a complex issue to measure as it has several important properties including: loudness (intensity, measured in decibels on a logarithmic scale [dB or dBA]), duration (continuous, intermittent, or impulsive), and frequency, (Kelly Drew, 2017). Measurements of loudness are often reported on the A-weighted scale, and can include additional penalties for evening and night levels (see glossary for additional information on noise measurements). In environmental noise and health research the focus tends to be on average noise levels for a specific period (day, night or 24 hrs) and measured in dBA. Since the decibel is a logarithmic unit, a sound received by the ear at 60 dBA is perceived as twice as loud as sound at 50 dBA.

Based on the environmental standard of Federal EPA, the generation of excessive noise in the community can have undesirable effects on the population. It can cause annoyance and disturbance to people at work or during leisure activities, disturbance to sleep and possibly a deleterious effect on general physical and mental well-being. All people are not equally sensitive to the disturbing aspects of noise. There is a small but significant minority which is more sensitive than others.

Table 2.2. Environmental Standards of Ethiopia on Noise emission Limits

Area code	Category of Area	Limits in decibel (dB)	
		Day time	Night time
A	Industrial area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45

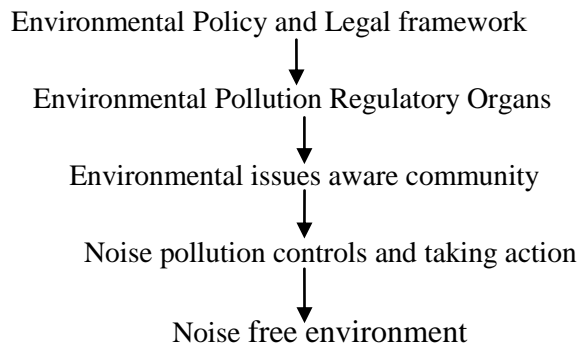
1: Day time reckoned to be between 6.00 am to 9.00p.m

2: Night time reckoned to be between 9.00p.m.to 6.00am

2.10. Conceptual frame work on noise pollution management

Environmental pollution management should be start with establishment of environmental policy and formulating of legal framework. The regulatory organs to enforce the policy and the legal framework should be established at all administrative levels of the city. The regulatory organs at all level should be well equipped in all aspects either in financial, material or human resources. The community as whole should be well aware about the issues of environmental pollution and related laws. The regulatory organs should carry noise pollution controls and taking appropriate measures to have noise free environment.

Figure.3. Conceptual framework



Source: Own Survey, 2019

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. A brief description of Addis Ababa

This study was conducted in Addis Ababa, the capital city of the government of Federal Democratic Republic of Ethiopia. It is a seat for African Union, United Nations Economic Commission for Africa, and other global and regional organizations. Addis Ababa is Hosting 30 percent of the urban population of Ethiopia, Addis Ababa, the capital of Ethiopia and the diplomatic center of Africa, is one of the fastest growing cities in the continent administratively, the city is a chartered city having three layers of government: city government, sub-city administrations, and district (Woreda) administrations. The city serves as social, economic and political center for the country. About 65% of industries of the country are located in the city (Gebre and Rooijen, 2009).

Addis Ababa had a built up area of 290 square km and has an estimated population of 4 million (Tolon, 2008). Its geographic location, combined with its political and socio-economic status have made it a melting pot to hundreds of thousands of people coming from all corners of the country in search of employment opportunities and services. High rate of unemployment (31%), concentration of slum dwellings, and poor housing, infrastructure and sanitary development, characterize Addis Ababa more than the few good features it possess (UN-Habitat, 2008.).

The rapid and mostly uncontrolled demographic growth and spatial expansion of large cities in developing countries often results in considerable damage to the environment. This is particularly true in the case of Addis Ababa, which today is suffering from high levels of solid waste problems. Among other indicators of environmental quality, the city has a very low density of public parks: only 0.66 m² per capita, against expectations of at least 6 m² per capita (Tolon, 2008). The demand for housing, clean water, waste disposal services, green spaces/public parks and other municipality services are beyond the actual services delivered in the city.

Urban environment can be generally represented by the level of clean water supply and urban sanitation as well as the air, soil and water quality. In addition to this, proper management of the urban ecosystem and efficiency of the urban system such as transport and energy use can be taken as part of the urban environment. But in Addis Ababa most residential areas are located near the busy places

such as bus-stand, market area, busy roads, airport, including church, mosque, night clubs, bars and restaurants...etc., which have contributed a high level of noise pollution. The streets of Addis Ababa have long become permanent exhibitions for earsplitting noises; it is no longer shocking to find schools and hospitals built adjoining bars, workshops and restaurants; nor residential quarters housing a host of bars and nightclubs; and churches and mosques are getting noisier by the day (Yibeltal, 2014)..

The enhancement of urbanization and the development of industrialization have a significant impact in modernizing citizens' lives. Since, Addis Ababa city is in a tremendous development path and because of that there is large expansion of industrialization, urbanization, motor vehicles which emit hazardous fume on the city street has contributed to increase in noise levels which aggravated the negative impact on the urban citizens. Currently the total number of vehicles registered in Ethiopia including motor bicycles and the locally assembled are 1,071,345. Over half of the totals registered in the country 596,084 are registered in the capital Addis Ababa, followed by Oromia region with 171,308 vehicles (<https://newbusinessethiopia.com>, 2019). There are also 231 Orthodox churches and 158 mosques in Addis Ababa (<https://lib.ugent.be>, 2014)

Coupled with rapid natural population growth, Addis Ababa is one of the cities posing critical challenges, including high rate of unemployment, housing shortage and environmental deterioration. In Addis Ababa most residential areas are located near the busy places such as bus-stand, market area, busy roads, airport, including church, mosque, night clubs, bars and restaurants etc., which have come lately, but contributed a high level of noise pollution. Even though, currently there is a high endeavor to change the old picture of the city, by clearing the slam areas of some parts of the city, either by redevelopment or other mechanisms, still the problem is mounting from time to time.

There are numerous Orthodox Churches, Mosques and Evangelical churches, Catholic Churches coupled with new business centers such as bars; restaurant and night clubs which were embarked with following the booming development line in each construction sites. Religious institutions such as (Orthodox, and Evangelical Churches and Mosque and others) are highly situated in the residential area send off their competitive loudspeaker and amplifier musical beat continuously.

Some industries are outdated and use obsolete machines which release a disturbing noise both during the day and at night. Grinding mills set up in the nearby residential areas also have similar effects. A good number of transportation vehicles have served more than 20 years and are the number one air and sound polluter. In Addis Ababa though sound pollution is not regarded as a threat to health by many, but it has been affecting citizens' lives. Studies have shown that road and air transportation, manufacturing, music shops, dogs, night clubs, sound advertisements and religious institutions are categorized as the major sound pollutants (Herald, 2019).

3.2. Research design

A descriptive research method was employed in this study since it allows describing the existing situations of the noise pollution and the practices of enforcing environmental laws to control environmental pollution in Addis Ababa. Therefore, descriptive design is applied to assess the institutional capacity of the regulatory organs to control noise pollution and to determine the awareness levels of the staffs of the regulatory organs.

3.3. Data type and sources

Both primary and secondary data types were used in this study. Primary data were collected by employing structured questionnaire and performance assessment check list. The secondary data sources were collected from published and unpublished documents. These include environmental manuals, brochures, WHO manuals and noise guidelines for community, magazines, newspapers, e-books, national and international legal instruments.

3.4. Target population of the study

Since the study deals with the assessment of the practices of enforcement of environmental laws and the challenges in controlling of noise pollutions, the subjects of this study were the environmental pollution control experts and law enforcers working in the environmental pollution regulatory offices.

3.5. Sample size and sampling techniques

There are 12 institutions that are expected to have duties and responsibilities in environmental pollution controls in the city of Addis Ababa, namely; the Federal FECCC, AAEPa and environmental protection offices in each ten sub city. Based on the organizational structure of FECCC, AAEPa and environmental protection offices, the total number of environmental pollution control experts to be present in all environmental regulatory organs are 83 (FECCC = 12, AAEPa =11 and sub city environmental protection offices=6) but only 58 (70%) ((FECCC = 12, AAEPa =6 and in each sub city environmental protection offices=4) are available. In this case the total numbers of environmental pollution control experts working at all level of the offices were 58 (i.e. $12+6+4 \times 10=58$ in 2019. Since this number of the targeted population in this study area is not so much large, a census technique was applied. But during the time of data collection 5 respondents were not available for annual leave and some other reasons. Therefore, data were collected from all the 53 respondents (i.e. 91% response rate).

3.6 Data Collection Methods and Instruments

The data were collected by distributing questionnaire to all environmental pollution control experts and assessing the five years actions of each office by using check lists. A Structured questionnaire with close and open ended questions has been designed for staffs those working in federal EFCCC, Addis Ababa city government environmental protection authority (AAEPa) and ten sub-city EPA offices. The questionnaire was prepared in English and translated into Amharic language to ensure clarity. Data entry, processing, analysis and presentation after collecting, the data was made by tallying, processed and analyzed in a line of its objective using a manual tally and presented the results using table of frequency. The respondents were asked to rank statements on contextual condition related to awareness and attitudes of the respondents to enforce the governing laws and effectiveness of the environmental pollution controls. Some of the items in the questionnaire were rated at a 5-point liker scale anchored by very low and very high for close ended question. Appropriate space is left for open ended question. Structured checklist also used to assess the five years practices of the regulatory organs in the controlling of noise pollutions.

3.7 Data analysis techniques

After the data were collected from various sources, a simple descriptive method is used to analyze the data based on the research objectives. Interpretation of the results and discussions were made based on the identification of prevailing practices and the law governing that particular practice to come up with consistency between the law and the practice and the existing reality in terms of the existing situation of noise pollutions in Addis Ababa.

CHAPTER FOUR

4. RESULT AND DISCUSSIONS

4.1. Over view of the Assessment

This part of the thesis presents the results of the study on the existing situation of noise pollution and the application of environmental laws in the city of Addis Ababa by assessing the performances of the federal environment forest and climate change commission/EFCCC/, Addis Ababa city administration environment protection authority/AAEPA/ and environment protection offices of all sub cities on controlling of noise pollutions. The respondents (n=53) in this study were environmentalists and some of them are department head of the environmental pollution control in the regulatory offices.

4.2. Background of the respondents

As mentioned under Chapter 3, data were collected from 53 experts working in various regulatory offices. Based on the organizational structure of the regulatory organs (EFCCC, AAEPA and each ten sub-city) the total numbers of environmental pollution control experts to be present are 83 but they are 58 for different reasons. In addition to that 5 respondents in different sub cities were not present in their office at the time of data collection. As result the data were collected from 58 experts, which yielded a 91% response rate. Among the total number of respondents (53), males are 36 (67.9%) and females are 17(32.1%).

Table4.1. Number and distribution of respondents by Gender status

Gender of respondents	Frequency	Percent
Male	36	67.9
Female	17	32.1
Total	53	100

Source: Own Survey, 2019

As can be seen from Table 4.1 below, 75.47% of the respondents have Bachelor Degree and 24.53% have master's Degree. It implies that, the demand for environmental experts in each regulatory organ is not fulfill. Table 4.1 presents the demographic and educational characteristics of the respondents.

Table.4.2. Number and distribution of respondents by Education status

Education level of respondents	Frequency	Percent
Bachelor Degree	40	75.0
MSc Degree	13	25.0
Other	0	0
Total	53	100.0

Source: Own Survey, 2019

4.3. Awareness level of the government officials and the community on environmental issues.

Table 4.3 below presents the awareness level of the government officials about on the environmental issues and related laws. The results of this study showed that the awareness level of the government officials about the concepts of noise pollutions and its impacts are different. According to the perception of respondents the mean score on the awareness level of the government officials on the effects of noise pollutions is 2.717 at a five point. This implies that the government officials have a low awareness level on the concepts and effects of noise pollutions in the city of Addis Ababa. The awareness and knowledge of the government officials about the existing environmental pollution control laws and regulations are also various. The mean score at a five point about the awareness and knowledge of the government officials on the existing environmental pollution control laws and regulations is 3.358. This implies that the awareness and knowledge of the government officials on the existing environmental pollution control laws and regulations are moderate.

Table 4.3.Awareness level of Government officials on the effects of environmental pollutions

Government officials	Very low	Low	Moderate	High	Very high	Total	average
Awareness levels on the effects of noise pollution	9 (17%)	9(17%)	27(51%)	8 (15%)	0	53	2.717
Awareness levels on environmental policy and related laws	4(7.5%)	13(24.5%)	22(41.5%)	14(26.5%)	0	53	3.358

Source: Own Survey, 2019

Table 4.4.presents the awareness levels of the community as whole about the environmental issues and related laws. The mean score on awareness level of the community as whole on the concepts of noise pollutions and its impacts is 2.358 at a 5 point. This implies that the communities as whole have a low awareness level on the concepts of noise pollutions and its impacts in the city of Addis Ababa.

In the case of awareness environmental policy and related laws, the majority (58%) of the respondents are identified low. The mean score on awareness level of the community on the existing environmental pollution control law is 2.490 at a 5 point. This indicates that the awareness level of the community on the existing environmental pollution control law is low. Thus the regulatory organs should strive to increase the awareness level of the community especially about the existing environmental related laws.

Table.4.4 Awareness level of the community about the effects of noise pollution and environmental laws

Awareness of the Community	Very low	Low	Moderate	High	Very high	Total	Average
Awareness levels on the effects of noise pollution	0	18 (34%)	31 (58%)	4 (8%)	0	53	2.358
Awareness levels on environmental policy and related laws	0	31 (58%)	18 (34%)	4 (8%)	0	53	2.490

Source: Own Survey, 2019

4.4 Awareness of environmental expert on duties and responsibilities of the regulatory organs and related issues

Table 4.5 presents the awareness level of the environmental pollution control experts on their duties and responsibilities, effects of noise pollution, and environmental policy and laws. Respondent were asked to identify their own awareness on responsibilities and duties of the regulatory organs, effects of noise pollution and the existence of environmental policy and laws. In the case of duties and responsibilities of the regulatory organs, the mean score at a five point is 2.660. This implies that the awareness levels of the environmental experts are nearest to moderate which is inadequate.

The mean score on awareness level of the environmental pollution experts on the effects of noise pollution is 3.207 at a 5 point. This also implies that the awareness level of the environmental pollution experts on the effects of noise pollution is moderate. The mean score on awareness level of the environmental pollution experts on the environmental policy and related laws is 3.226. This also implies that the awareness level of the environmental pollution experts on the environmental policy and related laws is moderate.

Table.4.5. Awareness of environmental experts on duties and responsibilities of the regulatory organs

Awareness level of the environmental Experts	very low	low	moderate	high	very high	average
	1	2	3	4	5	
Awareness on duties and responsibilities	0	5 (9.43%)	21 (39.62%)	12 (22.64%)	4 (7.55%)	2.660
Awareness on the effects of noise pollution	0	9 (16.98%)	26 (49.05%)	16 (30.19%)	2 (3.77%)	3.207
Awareness on environmental policy and legal frameworks	0	7 (5.66%)	30 (56.60%)	13 (24.53%)	3 (5.66%)	3.226

Source: Own Survey, 2019

4.5. The current situation of noise pollution in Addis Ababa

The answers of all respondents reveal the existence of noise pollution in Addis Ababa. All of them are identified yes for the question asking “is there noise pollution in Addis Ababa?” The existence of noise pollution in Addis Ababa is un-doubtable issues according to the respondent’s perceptions. The level of noise in Addis Ababa reaches to the level that causes physical and behavioral harm (G.Mintesnot, 2018). All respondents are experienced in measuring the noise levels using decibel (dB).

4.5.1. Noise levels emitted in Addis Ababa

The ranges of noises emitted from different point sources are different. Table 4.6 shows that the environmental protection offices of all sub cities have experience in measuring the noise emission of the night clubs, bars and restaurants. In this case, the respondents are asked to indicate the range of noise emitted from different sources using the choice of 1, 46-65 decibel 2, 66-85 decibel 3, 86-105 decibel 4, > 105 decibel 5, not measured. In the case of industries, vehicles, religious places and residences, the answer of all respondents are “not measured”. Where as in the case of bare and restaurants, the mean score of noise pollution is 3.302 at a 5 point .This implies that the noise emission level of bar and restaurants are lies between 86 to 105 decibel which is beyond the acceptable standards. The mean score of noise pollution emitted from night clubs is 3.434.This also implies that the noise pollution emitted from night club is lies between 86 to 105 decibel which is a little higher than bar and restaurants.

Depending on the Federal EPA environmental standards and Addis Ababa City Government Environmental Protection Authority sound pollution directive No.1/201875, the permissible noise emission rate for different zones at day and time are different. The allowable noise emission rate for industrial, commercial and residential areas, at day time is 75, 65 and 55 decibels respectively. Meanwhile the permissible emission rate for industrial, commercial and residential areas, at night time is 70, 55 and 45 decibels respectively. So when we compare the available data with these standards, bar, restaurants and night clubs emitted noise pollutions beyond the permitted levels. Even though the measurement carried out by the regulatory organs did not identified zone of the area like industrial, commercial and residential the noise emissions

of bar, restaurants and night clubs are higher than the standards in all cases. Especially the noise emissions of the night clubs are nearest to two folds of the standards of the country.

In addition to that, some people argue that the noise standard seem higher than some other countries, which show that Ethiopia tried to tolerates noise pollutions and even with the generous standards the noise emitted in many places are exceed the standard (Mintesnot G, 2018). According to Mintesnot G, (2018), a study by Mekonen and Leta which was published on International Journal of Environmental Science in 2014 showed that in 20 selected places in Mercato open market, the maximum observed value is 102.6 decibel (with the average range from 61.7 to 83.9 decibel).According to their analysis, the noise level at 19 of the 20 locations exceeded the recommended limit of 65 decibel for commercial places.

Table.4.6. Level of Noise emission in residential area at night time

Sources of noise pollutions	Emissions					Average (mean score)
	1 (46-65 decibel)	2 (66-85 decibel)	3 (86-105 decibel)	4 (>105 decibel)	5 (not measured)	
Industries	0	0	0	0	53	
Bar and restaurants	0	0	37	16	0	3.302
Night clubs	0	0	30	23	0	3.434
Music shops	0	0	0	0	53	
Vehicles	0	0	0	0	53	
Religious places (e.g. Orthodox churches)	0	0	0	0	53	
Religious places (e.g. Protestant churches)	0	0	0	0	53	
Religious places (e.g. Mosques)	0	0	0	0	53	
Residences	0	0	0	0	53	

4.5.2. Bases of noise pollutions control

Table.4.7 presents bases of noise pollution controls. Respondent were asked to identify bases of noise pollution controls in Addis Ababa. The survey results indicate that 88.68% respondents identified community complaints and 58.49% respondents are identified regular plan being used as base to control noise pollution controls. No one identified environmental audit report and

research results as bases of noise pollution controls. It implies that the environmental pollution control organs carried out the noise pollution control mostly on the bases of community complaints.

Table 4.7 Bases of noise pollution control

Types of measures	Frequency of measures					Average (mean score)
	1	2	3	4	5	
Based on Community complaint	0	0	0	6 (11.32%)	47 (88.68%)	4.886
Based on environmental audit report	53	0	0	0	0	1.00
Based on regular plan	0	0	3 (5.66%)	19(35.85%)	31 (58.49%)	4.528
Based on research results	53	0	0	0	0	1.00

Source: Own Survey, 2019

4.5.3. Community complaints on noise pollutions

The respondents were asked the question that “do the communities of Addis Ababa make complaints to your office on noise pollutions they face in their neighborhoods” with the choice of yes or no? All of the respondents answered the question by choosing yes. Results reveal that the community of Addis Ababa brought their compliments on noise pollutions to be avoided.

Table 4.8 presents the community compliments on point sources of noise pollution. Respondent were asked to rate 1(very low) to 5 (very high) the community complaints on various point sources of noise pollution. Some point sources of noise pollution such as industry (including metal and wood workshops); bar and restaurants; night clubs; music shops; vehicles; Orthodox churches; protestant churches; mosques; and residences were listed in the questioner. The mean score on community complaints on night clubs is 5.00 at a 5 point. This implies that night clubs are the major sources of community compliments in the issues of noise pollutions.

The mean score on community complaints on music shops and bar and restaurants are 4.717 and 4.679 respectively. This indicate that the music shops and bar and restaurants are another major sources of community compliant next to night clubs in the cases of noise pollutions. The mean scores on community complaints on religious places (protestant churches, mosques and orthodox churches) are 4.226, 3.698 and 3.679 respectively. This implies that the community compliments

on protestant churches is greater than the community compliments on mosques and orthodox churches.

The mean score on community complaints on residence is 2.830 at a 5 point. This indicates that the compliment of the community on residence is likely moderate. The study indicates that no community complaints brought to the regulatory organs on noise emissions of vehicles. In general, the results reveal that night clubs are the main causes of community compliant in relation to noise pollution in Addis Ababa. Music shops, bar and restaurants are rated next to night clubs in community complaint rate on noise pollution.

Table.4.8. Community complaints on point sources of noise pollutions

Complaints on point sources of noise pollutions	Community Complaint Rating					Average (mean score)
	1 (V. high)	2 (low)	3 (moderate)	4 (high)	5 V. high	
Industries	4 (13%)	12 (21%)	19 (36%)	11 (23%)	7 (7%)	3.132
Bar and restaurants	00	00	00	17 (32%)	36 (68%)	4.679
Night clubs	00	00	00	00	53 (100%)	5.00
Music shops	00	00	00	15 (28%)	38 (72%)	4.717
Vehicles	53	00	00	00	00	1.00
Religious places (e.g. Orthodox churches)	00	00	28 (53%)	14 (26%)	11 (21%)	3.679
Religious places (e.g. Protestant churches)	00	00	12 (23%)	17 (32%)	24 (45%)	4.226
Religious places (e.g. Mosques)	00	00	27 (51%)	15 (28%)	11(21%)	3.698
Residences	00	20 (21%)	22 (41%)	11 (38%)	00	2.830

Source: Own Survey, 2019

4.5.4. The practices of noise pollution control in Addis Ababa

Table 4.9 presents the noise pollution observed and avoided in all ten sub- cities in the last five Years. The total numbers of point sources noise of pollution observed in the last five Years (2014-2018) are 1,583. From the total observed point sources of noise pollution only 991

(62.60%) are avoided by taking different administrative measures. The remaining 672 (42.45%) observed point sources of pollutions are not avoided due to different reasons. From the observed sources of noise pollutions, the main point sources are recreational places mainly (night clubs, bar, restaurants and music shops), industry and religious places respectively. Noise emission from the vehicles did not observe in the study years. From the aforementioned total point sources of noise pollutions, the contribution of recreational places (music), industry, religious and residences are 1,188 (75.04%), 227 (14.34), 102 (6.44%) 66 (4.17%) respectively.

We have seen that most of the noise pollution controls are carried out on the bases of community complaints. The community complaints mainly focused on recreational places (night clubs, music shops bar and restaurants) and loud speakers from religious places. All the respondents confirm that no complaints brought to their office in relation with noise pollution from the vehicles. In relation to night clubs, bar and restaurants, the regulatory offices tried to control and avoid by taking different administrative measures. Giving of warning notes; sealing and relocating of the polluters are common administrative measures taken by the regulatory organs. No one take any action on the loud speakers from religious palaces. Therefore the majority of the noise pollutions which did not avoided deemed to be released from religious places.

Table.4.9.Noise Pollution observed, avoided and not avoided within the last five years in all sub cities

Sub-city	Number of pollution observed	pollutions sources					Number of pollutions avoided	Number of Pollution not avoided
		Industry	Music (night clubs, bars and restaurant and music shops)	Religious places (orthodox, protestants Muslims)	Vehicle	Residences		
Gullel	84	29	33	17	00	5	45	39
N/Lafto	81	21	40	13	00	7	51	30
Addis ketema	113	20	72	12	00	9	75	38
Arada	356	92	216	30	00	18	160	196
Akaki-Kality	215	24	176	11	00	4	120	95
Kirkos	450	28	414	-	00	8	294	156
Kolfe Keraniyo	16	4	6	4	00	2	5	11
Yeka	56	1	42	8	00	5	20	36
BOle	112	3	102	7	00	0	73	39
Lideta	100	5	87	-	00	8	68	32
Total	1,583	227	1,188	102	00	66	911 (56.8%)	672 (43.2%)

Source: AA sub-city environmental offices , 2019

4.5. Institutional capacities and effectiveness of noise pollutions control.

4.5.1. Institutional capacities

Table 4.10 represents the respondent's opinions on the institutional capacity of the regulatory organs and effectiveness of noise pollution controls in Addis Ababa. Respondent were asked to rate the institutional capacity of the regulatory organs and the effectiveness of noise pollution controls with the choice of 1 (very low) to 5 (very high). The mean score on institutional capacity is 2.434 at a 5 point which is nearest to 2. This implies that the institutional capacity of the regulatory organs is almost low. The mean score on effectiveness of noise pollution controls is 1.962 which is below 2. This indicates that, the effectiveness of the noise pollution control in Addis Ababa is also low. Therefore, we can conclude that the control of noise pollution in the city of Addis Ababa is not effective.

Table 4.10. Institutional capacity of the regulatory organs and effectiveness of noise pollution controls

Perceptions of respondents on;	very low (1)	Low (2)	Moderate (3)	High (4)	very high (5)	Average (mean score)
Institutional capacity of regulatory organs	7 (13%)	18 (34%)	26 (49%)	2 (4%)	0	2.434
Effectiveness of noise pollution controls	19 (36%)	20 (38%)	11 (21%)	3 (5%)	0	1.962

Source: Own Survey, 2019

4.5.2. Causes for weak controls of noise pollutions

Table 4.11 represents the respondent's perceptions on cause that make low institutional capacity of the regulatory organs and very low the effectiveness of noise pollution controls in Addis Ababa. Based on the result of this study, weak coordination among stakeholders, absence of clear policy frameworks, less awareness of the community as a whole, absence of clear legal frameworks, weak commitment of government officials and existence of weak institutions attributes to ineffectiveness of noise pollution control in the city of Addis Ababa.

Table 4.11 Causes of weak performance in noise pollution controls

Factors	Rating					Average (mean score)
	1	2	3	4	5	
Weak commitment of government officials	5	41	8	0	0	2.094
Less awareness of the community as a whole	9	39	5	0	0	1.924
Existence of weak institutions	5	41	7	0	0	2.037
Absence of clear policy frameworks	19	22	9	3	0	1.924
Absence of clear legal frameworks	15	23	15	0	0	2.00
Weak coordination among stakeholders	11	27	12	3	0	1.132

Source: Own Survey, 2019

4.5.3 Determinacy of Institutional Capacity to control environmental pollutions

Table 4.12 presents the perception of respondents about determinacy factors on effectiveness of noise pollution controls. Respondent were asked whether they agree or not by rating 1(very disagree) to 5 (very agree) with the determinacy of some issues listed in the table that may attribute in effectiveness of noise pollution control in Addis Ababa. The mean score of each determinacy factors is listed in the table below. The survey results indicate that all listed issues are the determinacy factors in noise pollution controls.

Table.4.12. Determinacy rate of factors in noise pollution controls

No	Determinant factors	Rate					Average (mean score)
		1	2	3	4	5	
1	Appropriate institutional arrangement	0	0	0	22	31	2.584
2	Clarity of duties and responsibilities of the regulatory agents	0	0	0	17	36	4.679
3	Clear policy framework	0	0	0	14	39	4.735
4	Clear legal framework	0	0	0	12	41	4.773
5	Appropriate man power	0	0	9	11	33	4.452
6	Tools and equipment	0	3	7	14	29	4.301
7	Adequate finance	0	5	8	17	23	4.094
8	Coordination with stockholders	0	0	1	21	31	4.566
9	Training/ capacity building	0	2	9	18	24	4.207
10	Awareness creation	0	0	4	11	38	4.641
11	safe working condition	0	0	0	12	41	4.773

Source: Own Survey, 2019

Table.4.13. Statues of regulatory organs to fulfill determinacy issue. Respondent were asked whether they agree or not by rating 1(very dis agree) to 5 (very agree) with the fulfillment of the determinant factors in the regulatory organs. The mean score about the fulfillment of each determinant factor by the regulatory organs is listed in the table below. The survey results indicate that all the respondents dis agree with fulfillment of safe working condition, coordination with stockholders, appropriate man power, adequate finance, appropriate institutional arrangement, tools and equipment and clear policy framework; by the regulatory organs. They also slightly dis agree with the fulfillment of clear legal framework, clarity of duties and responsibilities of the regulatory, training/ capacity building and awareness creation of the regulatory organs. In this case it is possible to infer that the regulatory organs are not in a position to control and manage noise pollutions properly.

Table.4.13. Statues of the regulatory organs in the fulfillment of the determinant factors

No	Determinant factors	Rate					Average (mean score)
		1	2	3	4	5	
1	Appropriate institutional arrangement	4	23	17	5	4	2.660
2	Clarity of duties and responsibilities of the regulatory	6	8	21	11	7	3.094
3	Clear policy framework	5	17	13	14	4	2.905
4	Clear legal framework	2	15	19	11	6	3.075
5	Appropriate man power	6	26	13	8	0	2.433
6	Tools and equipment	6	13	21	13	0	2.735
7	Adequate finance	5	22	18	8	0	2.547
8	Coordination with stockholders	4	31	10	7	0	2.339
9	Training/ capacity building	0	5	28	16	3	3.264
10	Awareness creation	0	4	18	24	7	3.641
11	Safe working condition	8	41	4	0	0	1.924

Source: Own Survey, 2019

4.6. The enforcement of environmental laws on noise pollution controls

Table 4.14 represents the opinion of the respondents on types of measures taken by the regulatory organs on the environmental polluters. Respondent were asked to identify measures taken listed in the table by the regulatory organs on the polluters with the choice of 1= not at all 2= Rarely 3= Some times 4=Most often 5= Always. The mean score on types of measures taken by the regulatory organs are listed below in the table.

All (100%) respondents affirmed that no regulatory organs framing either civil or criminal suits on noise polluters in the last five years. It implies that the regulatory organs tried to control environmental pollution by taking simple administrative measures mainly sealing and closing. Relocation and canceling of the license also implemented rarely.

Table.4.14. Types of measures taken by the regulatory organs

No	Types of measures	Frequency of measures					Average (mean score)
		1	2	3	4	5	
1	Closing /sealing	0	0	7 (13%)	9 (17%)	37 (70%)	4.566
2	Relocation	0	14 (26%)	39 (74%)	0	0	2.735
3	Suspending or cancelling of the license	5 (9%)	35 (66%)	13 (25%)	0	0	2.150
4	Framing of civil suits (for civil liability)	53 (100%)	0	0	0	0	1.00
5	Framing of criminal suits (for criminal liability)	53 (100%)	0	0	0	0	1.00

Source: Own Survey, 2019

The problem is that the awareness of the government officials and the community as whole about the essence of environmental laws and standards is week. The regulatory bodies by itself do not understand the laws and standards properly. On the other hand producing of admissible evidences is another headache of the regulator organs. More over definitions of some terms in environmental Proclamations are vague which is hard to understand. The other hinders to

implement the environmental pollution proclamation are absence of specific regulations and directives.

4.6.1. Administrative measure

According to article 3 sub article 2 of environmental pollution controls proclamation No.300/2002, the authority or the relevant Regional environmental regulatory agency may take administrative or legal measures against a person who release any pollutants to the environment in violation of law. In accordance with article 3 sub article 4 of the aforementioned proclamation administrative measures includes making decisions on any person who causes any pollution to clean up or pay the cost of cleaning up the polluted environment in such a manner and within such a period as shall be determined by the environmental regulatory agency. Based on article 3 sub article s of the pollution proclamation, the authority or the relevant regional environmental office shall take any necessary measure up to the closure or relocation of any enterprise in order to prevent harm when any activity poses a risk to human health or to the environment.

However, the law provides such strong administrative powers to the environmental regulatory organs, the measures they took are weak. Usually they took temporarily stopping of the releasing of pollution and rarely relocating and sealing. No one take administrative decisions on any polluters to clean up or to pay the cost of cleaning up the polluted environment.

4.6.2 Enforceability of the administrative measures

In this case the respondent were asked to rate the enforceability of administrative measures from the choice of 1=Very Low 2=Low 3= Moderate 4 = High 5=Very high.

The mean score on effectiveness of the administrative measures is 2.320 at a five point. This reveals that the enforceability of the administrative decisions taken by the regulatory organs is moderate. This implies that most of the polluters did not respect and enforce the administrative decisions. Releasing of pollutants to the environment continue after temporary stopping. There for, it is possible to conclude that noise pollution controls in the city of Addis Ababa is not effective. According to the assessment of this study, the main reasons for the weak enforcement of the administrative decisions are weak institutional capacity and lack of coordination among stakeholders.

Table15. Effectiveness of the administrative measures

Effectiveness of the administrative measures on noise pollutions	very low (1)	Low (2)	Moderate (3)	High (4)	very high 5	Average (mean score)
	12 (23%)	16 (30%)	21 (40%)	4 (7%)	0	2.320

4.6.3. Criminal and civil liabilities of environmental polluters under different laws

Based on environmental pollution control proclamation No 300/2002 environmental polluters may penalized for their various acts in relation to environmental pollution controls. For the purpose of this paper, only penalty directly to pollution is considered. In accordance with article 16 of the proclamation a natural person commits an offence if he discharges any pollutant contrary to the provisions of the pollution proclamation or regulations is liable, on conviction, to a fine of not less than one thousand Birr and not more than five thousand Birr or to an imprisonment of not less than one year and not more than ten years or both.

In the case of a juridical person, the conviction could be to a fine of not less than five thousand Birr and not more than twenty five thousand Birr. In this regard, the conviction includes an imprisonment of the manager/officer in charge for a term of not less than five years and not more than ten years, or a fine of not less than five thousand Birr and not more than ten thousand Birr or both.

Forfeiture and restorations are other legal measures which are enshrined in environmental pollution proclamation. Civil liabilities of the polluters focused on restoration/clean up the polluted area and compensate the damage by the pollution. Article 3 sub article 4 of the proclamation declare that any person who causes any pollution shall be required to clean up or pay the cost of cleaning up the polluted environment in such a manner and within such a period as shall be determined by the regulatory organs.

Article 17 of the proclamation specify that the court, before which a person is prosecuted for an offence of environmental pollutions ,may, in addition to any penalty it impose upon the convicted person, order:

- (a) The confiscation of anything used in the commission of the offence in favor of the state or to dispose of it in any other way;

(b) That the cost of cleaning up and the disposing of the substance, chemical or equipment seized be borne by the convicted person; and

(c) The convicted person to restore to the state in which the environment was prior to the infliction of the damage, and when such restoration is not possible to pay appropriate compensation.

The criminal code of Ethiopia No, 414/2004) under its Article 519 specify that, whoever, in breach of the relevant law, discharge pollutants to the environment is punishable with fine not exceeding ten thousand Birr, or with rigorous imprisonment not exceeding five years. Where the pollution has resulted in serious consequences on the health or life of persons or on the environment, the punishment shall be rigorous imprisonment not exceeding ten years.

According to article 520 of the criminal code ,fails to manage hazardous wastes or materials in accordance with the relevant laws or fails to label hazardous waste or materials or unlawfully transfers hazardous wastes or materials is punishable with fine not exceeding five thousand Birr, or rigorous imprisonment not exceeding three years, or with both. But as we have seen from the assessment, no polluters are brought to the court either for civil liabilities or for criminal penalties for the last five years. Therefore, one can infer that the governing laws of environmental pollution controls did not enforced properly as the law provided.

4.7. Challenges in noise pollution controls

4.7.1. Lack of resources

Absence of skilled human resource and lack of facilities such as vehicles and workable decibel (dB) are common challenges of the environmental regulatory institutions. Table.4.13.indicates that the fulfillment of the determinant factors by the regulatory organs are weak .The regulatory organs at all levels didn't well-equipped with appropriate instruments to measure noise pollution from different sources. In the case of

4.7.2. Less Awareness of the community as whole

Due to lack of good awareness about the noise pollution and its impacts, the community as whole is not so much sensitive about noise pollution. People can live, work and enjoy with the

harsh noisy places and they may not cooperate with regulatory organs to control noise pollutions. They also release noise to the others by their own means.

4.7.3. Lack of government commitment and coordination.

The environmental regulatory organs established at different levels are not well strong. Except establishing and allocating non substantial budget, the government did not give due attention in monitoring what challenges they confront and what they did and not did. So that the environmental regulatory organs at all levels are not efficient and they seem symbolic. The operation of noise pollution control is required the coordination of other stakeholders such as police, legal attorney and court. But there is no good coordination among them in noise pollution controls.

4.7.4. Absence of clear and strong legal framework.

The issue of noise pollution is not clearly and boldly articulated in environmental pollution control proclamation 300/2002. Many countries like America treat different environmental issues differently like the Clean Air Act of 1963, Clean Water Act and The Noise Pollution and Abatement Act of 1972. Therefore the absence of clear legal act on noise pollution is the main challenge of noise pollution controls.

4.7.5. The nature of the task

Night clubs, bars and restaurants are released noise pollution mostly during night. The situation during night is not convenient to carry out controls on noise pollution. Drunk people may disturb the regulatory teams when they measure the noise emissions from night clubs, bars and restaurants during night. The stakeholders do not have interest to cooperate in noise pollution controls during night. On the other hand controlling and abatement of noise from religious places is not simple task. Therefore, the religious issues are another challenges in the operation of noise pollution controls,

CHAPTER FIVE

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusions

The awareness level of both the government officials and the community as whole about the issue of environmental pollution and its impact is unsatisfactory. The awareness level of the community about the environmental pollution control laws is low whereas the awareness level of the government officials is moderate. Since the government officials and the community as whole do not have adequate awareness about the economic social and political impacts of environmental pollutions and environmental laws, environmental pollution control may not be effective.

Secondly, the awareness level of majority of environmental pollution experts about duties and responsibilities of the regulatory organs in environmental pollution controls, the effects of noise pollution on environment and health as well as the environmental policy and laws are not adequate.

Third, noise pollution is a critical environmental problem in Addis Ababa with high community complaints. The main sources of noise pollutions are night clubs, religious places (Orthodox Church, Protestant Church and Mosque respectively), music shops, bar and restaurants. According to the perception of the respondents, the level of noise released from night clubs, bar and restaurants are beyond the standards of the country. The measurement which is carried out in May 2019 by Addis Ababa EPA in collaboration with Bole sub city environmental protection office on noises released from night clubs, bar and restaurants are affirmed the perception of the respondents. Noise released from night clubs is the most nuisances to the community. Even though the noise released from religious places are very high, there is no big community complaints up on them. No complaints brought to the regulatory organs on noises released from vehicles and residences.

Fourth, noise is a prominent feature of the city environment. Noise pollution is becoming more and more acute, and hence many researchers are studying the effect of noise pollution on human health and environment. Noise pollution contribute to cardiovascular effects, and exposure to

moderately high levels during a single eight hour period causes a statistical rise in blood pressure of five to ten points and an increase in stress and vasoconstriction leading to the increased blood pressure noted above, as well as to increased incidence of coronary artery disease. An increasing number of studies indicate that wildlife is stressed by noise pollution causing a variety of impacts on the environment by disturbing mammal, bird and fish feeding and breeding patterns.

Fifth, All sub cities are carried out noise pollution controls even though the numbers of pollution they observed and avoided are not the same. Areada and kirkos sub cities are taking the lion share whereas Kolfe Keraniyo and yeka sub cities are taking the least share respectively. In general the numbers of pollutions not avoided are greater than the number of pollution avoided in all sub-cities. Community complaints mainly focused on night clubs, music shops bar and restaurants and loud speakers from religious places respectively. In relation to night clubs, bar and restaurants, the regulatory offices tried to control and avoid by taking different administrative measures such as giving of warning notes; sealing and relocating of the polluters.

Sixth, environmental pollution proclamation No .300/2002 as well as criminal code of Ethiopia and other related regulations and directives provides duties and responsibilities to regulatory organs to take legal and administrative measures on environmental polluters. But the regulatory organs either at federal, city or sub city levels did not take any legal measures either in civil suit to compensate the damage or in criminal suit to penalize the polluters in the last five years.

More or less they took administrative measures like giving of warning letters to stop the releasing of polluting matters, sealing, very and relocating. No polluters are suite either in civil or criminal court due to institutional incapacity in producing admissible evidence required by the law.

On the other hand the enforcement of administrative measures by itself is very week due to institutional incapacity and week commitment of government. Most of the polluters do not respect the administrative decision taken by the regulatory organs. They do not execute the administrative decisions as prescribed by the regulatory organs. They start to release pollutions immediately after the removal of the environmental pollution inspectors. Therefore, the applications of the environmental pollution control laws are very week.

Seventh, the regulatory institutions at all level are not well organized and equipped in terms of structure, skilled man power, appropriate equipment and adequate budget. Noise pollution control is not a simple task. It requires clear legal and policy frame works, strong institutions and the positive contributions of all stakeholders. Regulation of environmental pollution required clear policy and legal frameworks. The issue of noise pollution is not mentioned clearly and boldly in environmental pollution control proclamation. In general the regulatory organs do not fulfill the determinant factors that enhance pollution regulations.

Finally, Multidimensional institutional incapacity, low awareness of the community as whole including government officials about noise pollutions and its impacts, incomprehensive and vagueness of the law and weak commitment of the government officials are the main challenges of environmental pollution control in Addis Ababa.

5.2. Recommendations

To overcome the problems encountered in noise pollution controlling process the research work will recommend the following:.

- The regulatory organs at all level should endeavor on awareness creation to all legislative, executive and judicial bodies at all levels and to the community at large about the environmental pollution and its impacts on sustainability of developments. The awareness creation programs also includes about the duties and responsibilities of the regulatory organs and individuals as well as the bitterness of punitive measures that enshrined in existing environmental laws and regulations. This helps agencies, organizations, households and individuals to protect themselves from different punitive measures like prisons and fines.
- It is well known that there are lots of evidence regarding the health effects of environmental noise such as cardiovascular diseases, hearing impairment and sleep disturbance and stress. In order to protect the public including the most vulnerable groups such as children, the ones chronically ill and the elderly from noise exposures, the regulatory organs at all level should carry out their duties and responsibilities effectively in applying the environmental laws properly.

- In order to effective noise complaint management and to provide dynamic noise maps, improving and installing the environmental noise monitoring system in the scope of communicative tool in noise policy applications will be beneficial especially for the recreational noise pollution control smartly.
- Since the environmental regulatory organs at all level are the focal institutions for environmental protection, the power of the institution must be enhanced in order to make decisions accepted and respected by others.
- The government must devote its financial resources to accommodate pollution regulatory institutions in terms of human, financial and material needs for the effectiveness of the environmental pollution controls.
- EFCCC should provide intensive training to the pollution control experts who work either at EFCCC or at the Regions, city and sub city institutions to enhance their performance in environmental pollution administrations.
- The environmental pollutions regulatory institution at each level should make the environmental pollution controlling unit capable enough to fulfill its responsibility in controlling process in terms of:
 - a. Establishing effective regulatory process and making appropriate decisions.
 - b. Fulfilling the needed human, material and financial resource to oversee the controlling process.
- Since noise pollutions are series problems in Addis Ababa, the regulatory organs should carry out effective control on point sources and take appropriate measures as prescribed by the law.
- The study indicates that most of the regulatory organs carried out noise controls on the bases of complaints and regular plans. But it should include research results and audit reports.
- The regulatory organs at all level should take appropriate and effective measures based on environmental pollution control proclamation and regulations on polluters to keep the wellbeing of the city environment.
- Finally, in order to produce the effective solutions for environmental problems, establishment of a city strategic approach towards the problems and it is crucial to work towards on integral dimension.

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Annexes

Annex 1: questionnaire

Dear respondent

This questionnaire is designed to gather pertinent information on the institutional capacity to control noise pollution. The study is conducted as a partial fulfillment to obtain a Master’s degree in Environment and Development. The aim of the study is to assess institutional capacity to control noise pollution in the city of Addis Ababa. Your genuine responses are important for the success of this study. Hence, you are kindly requested to provide answers to the following questions.

Guide lines to provide answer in the questionnaire

- Put a tick mark under the number you choose for close ended questions.
- Write your answer and opinions on the space provides for the open ended questions

Section I: Background of the Respondent

1	Name of respondent's organization	
2	Position of the respondent's in the organization.....	
3	Gender (putting a tick mark in your best choice box)	3.1. Male <input type="radio"/> 3.2 Female <input checked="" type="radio"/>
4	Age of respondent?	_____ years
5	What is the highest level of education you attained?	1. Technical/ Vocational/ certificate 2. Diploma 3. Bachelor degree 4. Master’s degree 5. PhD candidate 6. PhD and above 7. Other(specify)_____

Section II. Questions on awareness level of government officials and community on environmental protection regulations.

1. How do you rate the awareness and knowledge of the government officials and the community as whole about the concepts of noise pollutions and its impacts? Please rate by using a rating scale of 1-5 by putting a tick mark in your best choice place.

1=Very low 2=Low 3=Moderate 4=High 5=Very high

Item	Rating				
	1	2	3	4	5
Government officials					
Community as whole					

2. In your opinion, how do you rate the awareness and knowledge of the government officials and the community as whole about the existing laws and regulations of environmental pollution control in the city of Addis Ababa? Please rate by using a rating scale of 1-5 by putting a tick mark in your best choice place.

1=Very low 2=Low 3=Moderate 4=High 5=Very high

Item	Rating				
	1	2	3	4	5
Government officials					
Community as whole					

3. How do you rate your awareness about the duties and responsibilities of your offices in environmental pollution controls? Please rate by using a tick mark in your best choice box.

1=Very low 2=Low 3=Moderate 4=High 5=Very high

4. How do you rate your awareness on the effects of noise pollution? Please rate by using a tick mark in your best choice box.

1=Very low 2=Low 3=Moderate 4=High 5=Very high

5. How do you rate your awareness on environmental policy and legal frameworks? Please rate by using a tick mark in your best choice box.

1=Very low 2=Low 3=Moderate 4=High 5=Very high

Section III. Questions on noise pollutions and controls

6. Based on your observation and knowledge is there noise pollution in Addis Ababa?

Please put a tick mark in the box of your best choice 1. Yes 2. No

7. If your response for the question “6” is yes how do you rate the severity of noise pollutions in Addis Ababa? Please rate by using a rating scale of 1-5 by putting a tick mark in your best choice place.

1=Very low 2=Low 3=Moderate 4=High 5=Very high

8. If your response for the question “6” is yes, could you rate the main sources of noise pollutions in Addis Ababa by using a rating scale of 1-5 and by putting a tick mark in your best choice place?

1=Very low 2=Low 3=Moderate 4=High 5=Very high

Sources of noise pollution	Rating				
	1	2	3	4	5
Industry					
Bar and restaurants					
Night clubs					
Music shops					
Vehicles					
Religious places (e.g. Orthodox churches)					
Religious places (e.g. Protestant churches)					
Religious places (e.g. Mosques)					
Residences					

9. In your organization, how do you carry out noise pollution controls? Please rate by using a rating scale of 1-5 by putting a tick mark in your best choice place.

1=Not at all 2=Rarely 3= Sometimes 4=Most often 5= Always

Types of measures	Frequency of measures				
	1	2	3	4	5
Based on Community complaint					
Based on environmental audit report					
Based on regular plan					
Based on research results					
Others					

10. Do the communities of Addis Ababa make complaints to your office on noise pollutions they face in their neighborhoods? Put a tick mark in the box of your best choice.

1. Yes 2. No

11. Have you ever measures the release of noise pollution from the different sources in the last five years?

1. Yes 2. No

12. If your answer for Q 11 above is “Yes”, indicate the amount of noise pollution they released by putting a tick mark (-) in the table below based on the following choices.

1= 45-65(dB) 2= 66-85(dB) 3= 86-105(dB) 4= < 105(dB) 5= not measured

Sources of noise pollutions	Amount of noise measured at night time									
	At the source					Out of the sources				
	1	2	3	4	5	1	2	3	4	5
Industries										
Bar and restaurants										
Night clubs										
Music shops										
Vehicles										
Religious places (e.g. Orthodox churches)										
Religious places (e.g. Protestant churches)										
Religious places (e.g. Mosques)										
Residences										

13. How many complaints brought to your office in the last five years on noise pollutions?

Sources of noise pollutions	Number of point sources of pollution observed	Avoided based on your office decision	Not avoided
Industrial work shops			
Music from recreational places			
Religious places			
Vehicle			
Loud speakers from religious places			
Residences			
Others			

14. If there are noise pollution not avoided in question No. 12, please explain the reason briefly.

.....

.....

15. Would you agree on the determinacy of the following factors on environmental pollution controls

.Please show your agreement by putting a tick mark in your best choice place?

1= Strongly agree 2) = Agree 3= slightly agree 4= Dis agree 5 = Strongly dis agree

Determinant factors	Rate				
	1	2	3	4	5
Appropriate institutional arrangement					
Clarity of duties and responsibilities of the regulatory agents					
Clear and strong legal framework					
Appropriate man power					
Tools and equipment					
Adequate finance					
Coordination with stockholders					
Training/ capacity building					
Awareness creation					
safety working condition					

16. Does your office fulfill the determinant conditions to control noise pollutions? Please show your agreement by putting a tick mark in your best choice place.

1= Strongly agree 2) = Agree 3= slightly agree 4= Dis agree 5 = Strongly dis agree

Determinant factors	Rate				
	1	2	3	4	5
Appropriate institutional arrangement					
Clarity of duties and responsibilities of the regulatory agents					
Clear policy framework					
Clear legal framework					
Appropriate man power					
Tools and equipment					
Adequate finance					
Coordination with stockholders					
Training/ capacity building					
Awareness creation					
safety working condition					

17. Have you got any problems during monitoring of noise pollutions?

Please put a tick mark in the box of your best choice. 1. Yes 2. No

18. If your response for the question 17 is “yes”, could you explain briefly the problems do you face during monitoring the noise pollutions?

.....

.....

.....

19. How do you rate the existing institutional capacity of your office to control environmental pollutions?

1) very low 2) low 3) moderate 4) high 5) very high

20. How do you rate the effectiveness of noise pollution controls in the city of Addis Ababa? Please rate by using a rating scale of 1-5 by putting a tick mark in your best choice place.

1) very low 2) low 3) moderate 4) high 5) very high

21. If your response for the question 20 is “very low” or “low” how do you rate the contribution of the following factors for that effect? Please rate by using a rating scale of 1-5 by putting a tick mark in your best choice place.

1=Very Low 2=Low 3=Moderate 4=High 5=Very high

Factors	Rating				
	1	2	3	4	5
Less awareness of government officials					
Less awareness of the community as a whole					
Existence of weak institutions					
Absence of clear legal frameworks					
Absence of strong legal frameworks					
Weak coordination among stakeholders					

22. What types of administrative and legal measures have been taken by your office in the last five years up on the polluters based on environmental pollution proclamation and regulations? Please rate by using a rating scale of 1-5 by putting a tick mark in your best choice place.

1=Not at all 2= Sometimes 3=Most often 4=Most often 5= Always

No	Types of measures	Frequency of measures				
		1	2	3	4	5
1	Closing /sealing					
2	Relocation					
3	Suspending or cancelling of the license					
4	Framing of civil suits (for civil liability)					
5	Framing of criminal suits (for criminal liability)					

23. If your response for question 22 number 4 and 5 is “Not at all” or “Rarely” explain the reasons briefly.....

24. How do you rate the effectiveness of the administrative measures taken by your office in the control of environmental pollutions? Please rate by using a rating scale of 1-5 by putting a tick mark in your best choice place.

1) very low 2) low 3) moderate 4) high 5) very high

25. If your response for question 24 is "Low" or "very low" explain the reasons

briefly.....

.....

26. In your opinion, what would be the solution to govern the city noise pollution problems properly?

Please provide your suggestion in the space


below.....

.....

.....

Thank you very much for participating in this study.

Annex 3: Letter from AAEPa to Bole sub city environmental Protection and Green Development office on the issue of taking action on identified noise polluters.



በአዲስ አበባ ከተማ አስተዳደር የአካባቢ ጥበቃ እና አረንጓዴ ልማት ኮሚሽን
Addis Ababa City Government Environmental Protection & Green Development Commission


ቁጥር 221112-0113286
 Ref. No. 15/9/2011
 ቀን
 Date

ለቦሌ ክፍለ ከተማ አካባቢ ጥበቃና አረንጓዴ ልማት ጽ/ቤት

አዲስ አበባ

ጉዳይ :- እርምጃ እንዲወሰድ ስለማሳወቅ፤

በቦሌ ክፍለ-ከተማ በሚገኙ ወረዳዎች በአብዛኛው የድምጽ ብክለት ችግር በሚከሰትባቸው አካባቢዎች የድምፅ ብክለት ክትትል እና ቁጥጥር በፌዴራል የአካባቢ፣ደንና አየር ንብረት ኮሚሽን፣ በማዕከልና በክፍለ ከተማ ባለሞያዎች ስራ መሰራቱ ይታወቃል። ሆኖም ግን የድምፅ ልኬት መረጃው ከተያዘ በኋላ፣ እርምጃ በአንዳንድ ክ/ከተሞች እየተወሰደ አይደለም። ስለሆነም ከዚህ ሸኚ ደብዳቤ ጋር አባሪ ተደርገው የተረቡት የንግድ ተቋማት ከዚህ በፊት የነበረውን እርምጃ መሰረት ተደርጎ፣ ተገቢውን አስተዳደራዊና ህጋዊ እርምጃ ወስዳችሁ በሪፖርት እንድታሳውቁን እንገልጻለን።



ከሰላምታ ጋር

ግልባጭ:-

- > ለኮሚሽነር
- አ/አ/ጥ/አ/ል/ኮ

Handwritten notes:
 ከአገልግሎት ጋር የተያያዘ
 በክፍለ ከተማ ደ/ር/አ/አ/ጥ/አ/ል/ኮ
 ለድምፅ ልኬት መረጃው ከተያዘ በኋላ፣ እርምጃ በአንዳንድ ክ/ከተሞች እየተወሰደ አይደለም።

011-6-46 38 43 011-6-46 38 44 011-3-33-25-11	አካባቢን በመጠበቅ ለመኖር ምቹ ሁኔታን እንፍጠር Let us harmonize our life with the environment by protecting it !! www.facebook.com/addisababaenvironmentalprotectionauthority	Fax 251-11-6-46 38 41 P.O.Box 8958 Email:- aaepa25@gmail.com Website:- www.aaepa.gov.et
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የፌዴራል ስነምግባር ጥበቃና አረንጓዴ ልማት /ኮሚሽን / እና የቦሌ ክፍለ ከተማ ስነምግባር ጥበቃ ጽ/ቤት የምስት ሰራ መረጃ

ተ.ቁ	የተቋሙ ስም	መረዳ	በምስት የሰቀው የደምጽ መጠን በስነምግባር/ ከውጥ	በምስት የሰቀው የደምጽ መጠን ከተቋም ውስጥ	ምርመራ
1	የዳ ባርና ሳውንድ				
2	ዋን ሳብ ቁርስ ቤት	14	75	92	ከደረጃ በላይ
3	ሚኪ ምግብ ቤት	14	76	94	ከደረጃ በላይ
4	ፍቅር ባርና ሳውንድ	14	77	93	ከደረጃ በላይ
5	አማህን ሳውንድ	14	72	93	ከደረጃ በላይ
6	የደርጃ ዳውን ታውን	14	71	94	ከደረጃ በላይ
7	የደርጃ አቢሊያ	14	74	111	ከደረጃ በላይ
8	ግራን ሺላ ሳውንድ	14	75	93	ከደረጃ በላይ
9	ስም የሌለው ግርሰሪ/ትግስት/	14	74	96	ከደረጃ በላይ
10	ምንታ ቤት አጠገብ/ምቸት/	14	78	95	ከደረጃ በላይ
11	ብሉ ናይል ባር	14	79	114	ከደረጃ በላይ
12	ኪርቲና ክትፎ ቤት	14	66	95	ከደረጃ በላይ
13	ዘ ሳት ባር	13	78	93	ከደረጃ በላይ
14	ሶላይቲ ባር	3	79	112	ከደረጃ በላይ
15	ብላክ ፒር ባርና ሪስቶራንት	3	74	117	ከደረጃ በላይ
16	በእምነት ባር	3	75	112	ከደረጃ በላይ
17	ፓራጎን ባር	3	72	115	ከደረጃ በላይ
18	አክስ ሾ ባር	3	77	95	ከደረጃ በላይ
19	ሌቭል አፕ ሳውንድ	3	74	95	ከደረጃ በላይ
20	ሊኢቶ ዲስ ባር	3	71	111	ከደረጃ በላይ
21	ኮኮ ሳውንድ	3	75	113	ከደረጃ በላይ
22	ፍዩሪ ባር	3	78	97	ከደረጃ በላይ
23	ፕቡም ባር	3	74	93	ከደረጃ በላይ
24	ምሳሌ ባር	3	79	95	ከደረጃ በላይ
25	ካስትራ ባር	3	84	92	ከደረጃ በላይ
		3	72	93	ከደረጃ በላይ



26	ሰጋርክ ባር	3	73	93	ከደረጃ በላይ
27	ዙመራ ጠገዳ ባር	3	71	92	ከደረጃ በላይ
28	ሩት ሀውስ	3	74	93	ከደረጃ በላይ
29	ሚክስ ባር	3	72	92	ከደረጃ በላይ
30	ሰላም ሀውስ	3	72	93	ከደረጃ በላይ
39	ሃሱ ፐብ	3	63	93	ከደረጃ በላይ
40	ኤ ም ባር	3	67	93	ከደረጃ በላይ
41	ፕሮሚስ ባር	3	69	112	ከደረጃ በላይ
42	ሰላምራ ባር	3	64	115	ከደረጃ በላይ
43	ሚሂ ባር	3	62	112	ከደረጃ በላይ
44	ኦንደ ሚሚስ ባር	3	63	92	ከደረጃ በላይ
45	ቪ ኦይ ፒ ሳውንድ	3	69	112	ከደረጃ በላይ
46	ፊደል ባር	3	68	112	ከደረጃ በላይ
47	ቸ ባር	3	69	114	ከደረጃ በላይ
48	ዲሞክራሲ ሳውንድ	3	74	112	ከደረጃ በላይ
49	ህያብ ባር	3	75	115	ከደረጃ በላይ
50	ሀረር ባር	4	78	90	ከደረጃ በላይ
51	ባር ኤደን	4	79	98	ከደረጃ በላይ
52	ኤደን ባ	4	74	96	ከደረጃ በላይ
53	ጸዲ ባር	4	71	98	ከደረጃ በላይ
54	ሚና ባር	4	71	94	ከደረጃ በላይ
55	ሪፐብሊክ ባር	4	72	114	ከደረጃ በላይ
56	ባር ሚሎ	4	73	110	ከደረጃ በላይ
57	ሁድ ይሂር ግርሰሪ	4	74	99	ከደረጃ በላይ
58	ሰይፈ ባር	4	77	112	ከደረጃ በላይ
59	ሳሚ ባር	4	77	113	ከደረጃ በላይ
	ዋልዎ ሀውስ ያሱት ቤተኛ በአጠቃላይ 9/ዘጠኝ				
60	ቤተኛ/	4	77	112	ከደረጃ በላይ
61	ሪኪብ ባር	4	77	93	ከደረጃ በላይ
62	ሰኒ ባር	4	77	93	ከደረጃ በላይ
63	ሰብስ ባር	4	77	93	ከደረጃ በላይ
64	ሰብ ባር	4	77	93	ከደረጃ በላይ
65	መታደል ባር	4	77	93	ከደረጃ በላይ
66	ሀረር ባር	4	77	93	ከደረጃ በላይ



67	መሣሪያ ቤቅ	4	77	99	ክደረጃ በላይ	
68	ሰማርት ቤቅ	4	77	99	ክደረጃ በላይ	
69	አይሚ ቤቅ	4	77	99	ክደረጃ በላይ	
70	አሙቲ ቤቅ	4	77	99	ክደረጃ በላይ	
71	ሰላም ቤቅ	4	78	99	ክደረጃ በላይ	
72	መሰይ ላውንጅ	4	78	111	ክደረጃ በላይ	
73	ላገት ፐብ	4	75	79	ክደረጃ በላይ	
74	ማስ ብርዝ	3	95	112	በከተማና ፊደራል የተሰኘ	
75						
76						
77						

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