

**PUBLIC PERCEPTION ON THE EFFECTS OF ENVIRONMENTAL
POLLUTION IN THE SUB-URBAN DISTRICT OF MUSHIN LOCAL
GOVERNMENT AREA OF LAGOS STATE**

BY

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**BEING A DISSERTATION SUBMITTED TO THE SCHOOL OF POST
GRADUATE STUDIES, BAYERO UNIVERSITY KANO IN PARTIAL
FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF
SCIENCE (M. Sc.) DEGREE IN ENVIORNMENTAL MANAGEMENT**

SEPTEMBER, 2021

DECLARATION

I hereby declare that this work is the product of my own research effort undertaken under the supervision of Dr. Ahmed Fate Ali. It has not been presented anywhere for the award of degree or certificate. All the sources have been duly acknowledged.

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CERTIFICATION

This is to certify that the research work for this dissertation and its subsequent preparation by Ali BukarFannami (SPS/17/MEV/00009), were carried out under my supervision.

Dr. Ahmed Fate Ali

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CERTIFICATION

This M.Sc. dissertation, titled: *Pubic perception on the Effects of Environmental Pollution in the Suburban district of Mushin Local Government Area of Lagos State* by Ali BukarFannami (SPS/17/MEV/00009) and went through constructive observations, reviews and corrections before approval and being certified to have met one of the requirements for the award of Master of Science (M.Sc.) Degree in the Department of Environmental Management, Bayero University, Kano.

External Examiner

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ACKNOWLEDGEMENTS

In the name of Allah the Beneficent and the Merciful, all praises and gratitude be to Allah (SWT). Peace and blessings be upon our Noble Prophet Muhammad (SAW), his Family and companions. My special gratitude goes to my parents who because of the special upbringing given to me, I understand the value of knowledge, which helped me tremendously in kick-starting this academic pursuit.

At the university, I must acknowledge my supervisor, Dr. Ahmed Fate Ali, who, in spite of his so many commitments, supervised the entire work and guided me through. His seriousness in relation to academic activities has taught me very important lessons that remain helpful in my academic endeavour. I hereby acknowledge the fatherly advice of Dr. Bulama Mali Gubio, Umara Bukar Fannami thanks to Dr. Zanna Bulama Mali Gubio, Dr. Amina, Ibrahim Bukar Fanni, Usman Bukar Fannmi, Abubakar Sadique, Mallam Anas and Alhaji Shettima Umar. My regards to all other academic and non-academic staff of the Environmental Management Department. I must also acknowledge the cooperation of Rukayya Bukar and Umara Bukar Fannami for their support.

My gratitude to all my family members Alhaji Fannami's and Alimami's family, particularly Alhaji Babakura, Babagoni, Badama, Alhaji Ibrahim, Alhaji Kaka Ali and my bosom friend, Saminu Murtala, who have shown special concern about my studies.

DEDICATION

This work is dedicated to my parents, the late AlhajiBukarFannami and HajiyaHalima Goni as well as my Sister RukayyaBukarFannamifor their encouragement and emphasis on acquiring knowledge no matter how difficult. May Almighty Allah reward them abundantly (Ameen).

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ABSTRACT

This study examined public perception on the effects of environmental pollution in the sub-urban district of Mushin Local Government Area of Lagos State, in order to identify various causes of environmental pollution and practical steps taken by the government and relevant organizations to ensure possible solutions and means of controlling the phenomenon of environmental pollution. Mixed research methods were adopted. The population of the research work consists of all the 633,543 residents of Mushin local Government Area, from which a sample of 358 respondents were selected. A total of 384 questionnaires were distributed to the sampled respondents which includes residents of Alakara, Idi-oro/Odi-olowo, Babalosa, Ojuwoye, Ilupeju, Olateju, Kayode/Fadeyi and Ilupeju/Industrial others are Mushin/Atewolara, Papa Ajao, Ilasamaja, Babalosa/Idi-Araba, Itire and Idi-Araba in Mushin Local Government Area of Lagos State Nigeria. It was found that bad odour arising from open dump site, blocked drainages and canals, smokes from automobile engines, discharge of gasses into the air like smokes from industries and deforestation are some of the major causes of environmental pollution. The finding of the study also revealed that majority of the respondents are aware of the causes of environmental pollution in the area. Most of them are of the opinion that blocked drainage, poisonous exhaust from cars and bush burning are the major causes of environmental pollution, Similarly, all the three forms of pollution which are air, water and land pollution have significant negative effects on environment in the Sub-urban District of Mushin Local Government Area. Furthermore, among the benefits derived from the management of environmental pollution in the study area are cleaner environment, less visits to the hospital and less spending on drugs. It was recommended that residents should be sensitized on the causes of pollution from land, water and air, proper waste disposals, and what can be done to reduce or eliminate the pollution in order to ensure good quality environment.

CHAPTER ONE

1.1 INTRODUCTION

1.2 Background of the Study

All over the world, environmental pollution is an issue of greatest concern because of importance of the environment to human survival and indeed the survival of the earth itself (Mashood&Arsalan, 2011). Williams (2006) affirms that it's well recognized that the environment is one of the major factors affecting health. He however points that Nigeria suffers from both primary and secondary environmental problems resulting from under development and growth in industrialization. As a result, human Idea and activities are endangered on a daily basis. Environmental pollution is one of the Phenomenon that has gained international attention including Nigeria, Lagos State hence as a matter of priority and Mushin local Government Area too. News Agencies, Health Organizations, Federal Government's Ministries of Health have passed information about the menace associated with environmental pollution to the masses.

All these represent a source of environmental pollution involving the littering of roads with refuse, dumping of refuse on road, sides and the conversion of drainages. Other parts of the country, human faeces are passed in small brushes around people's homes. The experience is the same in high density areas and urban shows where people pass faeces into gutters and dump domestic waste products in the streets, blocking both drainage and vehicular passage in some places where pit latrines are used, they scarcely go with lids Apart from the stench, which exudes from such latrines, food can easily be contaminated by flies, which have their habitats there. Pollution associated with poor sanitary habits can therefore be said to be a product of underdevelopment(Hopkin,2000).

The introduction by man into the environment of substances or energy liable to cause hazards to human health, harm to living resources and ecological systems, damage to structure or amenity or interference with legitimate uses of the environment”.

Environmental Pollution occurs when there is the potential for harm. Harm of man is not confined to physical injury but encompasses offence caused to any of his senses or harm to his property, therefore smells and noise which may not cause injury can constitute pollution. Harm to living organisms can include harm to their health or interference with the ecological systems of which they form a part.

The effects of environmental pollution are global and concern all countries irrespective of their size, level of development or ideology. Notwithstanding political division of the world into national units, oceanic world is inter connected whole, and winds that blow over the countries are also one. Environment is a universal phenomenon pervading the whole world at large. Williams (2009) Science and technology brought in revolutionary change in human life. Modernization made man's life more and more comfortable. Today one can travel faster, speak or send message to distant lands through the modern means of communication. Villages have become growing cities as a result of industrialization which in turn presents its own side effect. Modern industries produce industrial wastes and toxic gases which are hazardous to human health. In other words, modern man is exposed to air pollution, water pollution etc., in and around as a result of industrial wastes and of the toxic gas produced by industrial houses and modern automobiles (Williams, 2009).

The most common pollutants are usually chemicals, garbage, and waste water, and are causing great damage to ecosystem that depends upon the health of this environment (Baijet, 2001). However, Sub-urbans District of Mushin Local Government Area of Lagos State citizens are

suffering from plague of illness, diseases which decreases the living standard of people that make any country a great nation. The mismanagement of these wastes can lead to short term risks, environmental degradation, breeding of insects, spontaneous fire outbreak. It has been observed that environmental pollution identifies improper, ineffective and unhygienic disposal of refuse materials as vectors of environmental pollution. Some studies show that dumping of refuse enables rats, flies and other carriers of dangerous diseases to flourish and research findings have also shown that from each household turn out lots of rubbish a year which comprise of paper, cardboards, waste glass, damaged cars, non-cycling of scrapped cars and their components.

The effects of environmental pollution, manifested by the emergence of serious health problems and ecological disturbance, recognized internationally at the Stockholm Conference, have led to a broad “environmental movement” in both developed and developing countries. Human being is the only being who destroys its own living environment. Through its activities we destroyed the natural balance that has been maintained for millions of years. Developed and developing countries. This action included the active participation of both the public and private sectors. The main feature of this environmental movement was that it generated a new perspective for the evolution of attitudes and knowledge in this field. As part of a world-class evolutionary process, marked by the Rio and Johannesburg Conference, several key issues for structuring and orienting environmental management tools have been recognized (Peighambarzadeh&Tavana, 2017).

Many of the effects of human activities on the environment have global and regional expansion while others are limited to specific geographic areas requiring practical solutions and measures at all levels. In the elaboration of economic strategies and policies of the governments, it is considered that environmental protection is a necessary component of the transformation of the

economic system and the sustainable development of society as such most countries follow the international trend to develop environmental policies based on the polluter pays principle(Georgieva&Nikolova, 2017).

Through its activities the natural balance that has been maintained for millions of years were destroyed and there is little investment to save life on Earth. The crisis caused by the lack of protection of today's environment, whether from developed countries or from poor countries, as well as the crisis of human civilization is due to pollution that go beyond the positive endpoints (Coroian&Miresan, 2017).

1.3 Statement of Research Problem

The beauty of any environment lies on its good sanitary condition (Alma, 2015). This is so because, when an environment is clean the lives of citizen are not threatened by illness and disease. Proper refuse disposal management involves the dumping of waste (solid, liquid or gaseous) from homes, industries and public outfits for example hotels, hospitals, schools etc.

For centuries business was done without consideration for the environment. This resulted in damage to the natural resources. According to Sime&Robert (2016) environmental issues have been a matter of public concern for over a quarter of a century. As knowledge relating to the cause and effect of environmental pollution has become more of a public concern, the pressure to change the ways in which we behave has increased. Much of this pressure has been targeted towards industry, which is often identified as the major source of pollution. Environmental pollution has the capacity to affect both the short-run and long term health of people living in Mushin Local Government Area. While this is particularly true with regard to the activities of those firms in heavy pollution industries, no firm or industry is immune from environmental risk (Sime&Robert, 2016).

During the 1970s and 1980s, the environmental disasters of Bhopal, Chernobyl, and the Exxon Valdez captured the public's attention. However, the environmental damage caused by headline catastrophes is small compared to the daily environmental damage that society causes (Hopkins, 2000).

Traditionally, environmental pollution has been viewed as a constraint to health and businesses. This has resulted in government and relevant stakeholders of developed nations heavily rely on a reactive, compliance-based approach to justify change. People are now recognizing that efficient management of environmental pollution can benefit the entire society and industries (Schell & Gallo, 2006).

Environmental standards are the result of public concern over the impact industry has on the environment both locally and globally. The general public is demanding that industries all over the world take responsibility for their actions. ISO 14000 is an attempt to harmonise the environmental requirements for all industries throughout the world (WHO, 2015).

Most of people in Sub-urban District of Mushin Local Government Area neglect of filled refuse bins, indiscriminate refuse dump which affects quality of water and air of which people seem not be aware. Public education and program that enlighten the public on the health implications of indiscriminate refuse dump are almost non-existent. Mass media seem not to be doing enough to create awareness about implications of indiscriminate refuse dump.

The growing effect of environmental pollution in Mushin Local Government Area of Lagos State calls for an immediate action to manage all the surrounding environmental condition which increases growth of water, land, atmosphere and space as a result of environmental pollution

(Derid, 2000). Udoudo (2006) observe that in some localities in Nigeria, especially among the Sub-urban Districts of the Lagos region, one can hardly find modern toilet facilities. There are environmental challenges as well as socio- economic problems created by adverse effects of environmental pollution which is threatening Mushin Local Government Area of Lagos and Nigeria in general.

1.4 Research Questions

- i. What are the causes of environmental pollution in the Sub-urban District of Mushin Local Government Area of Lagos State?
- ii. What is the perception on environmental pollution by the inhabitants of Mushin Local Government?
- iii. What are the practical steps taken by government and relevant stakeholder to control environmental pollution in the study area?
- iv. What are the benefits derived by the people of Mushin Local Government Area of Lagos State in managing environmental pollution?

1.5 Aim and Objectives of the Study

The aim of the study is to examine public perception on the effects of environmental pollution in the Sub-urban district of Mushin Local Government Area of Lagos state. The objectives of this study are to:

- i. To identify the causes of environmental pollution in the Sub-urban district of Mushin Local Government Area of Lagos State.
- ii. To assess the perceptions on environmental pollution of inhabitants of Mushin Local Government.

- iii. To identify the practical steps taken by the government and relevant stakeholders in controlling environmental pollution.
- iv. To assess the benefits derived by the inhabitant on managing the environmental pollution in the study area.

1.6 Significance of the Study

The study on the effects of environmental pollution will make the people of Mushin Local Government Area to realize the importance of effective refuse disposal and waste bins and waste control. It will also be significant to people of Mushin in a way that they will know the proper waste control strategies and how to manage and preserve the environment for the good health of the people. It will also be of help to the people living in commercial and industrial areas of Mushin and also will help the people know the causes and effects of environmental pollution and the danger it posed to human health. The study will also be of importance to other Local Governments in Lagos State especially environmental health care department will benefit from it through organization of seminars, workshops, and conferences on proper management of the environment and come up with strategies to improve pollution. The study will also enlighten the members of the community as well as the entire state on the effects and prevention of environmental pollution.

1.7 Scope and Limitation of the Study

This research work is design to cover the entire area of Mushin Local Government Area of Lagos State which comprises of Alakara, Idi-oro/Odi-olowo, Babalosa, Ojuwoye, Ilupeju, Olateju, Kayode/Fadeyi, Ilupeju/Industrial, Mushin/Atewolara, Papa Ajao, Ilasamaja, Babalosa/Idi-Araba, Itire and lastly Idi-Araba making a total of 14 wards. However, the study focus on public perception on the effects of environmental pollution, the causes of environmental pollution,

practical steps taken by government and relevant organizations to ensure possible solutions and benefits derived from managing the environmental pollution among the people of Mushin Local Government Area of Lagos State. The study is also limited to environmental pollution such as land, water and air pollution. therefore, other form of environmental pollution such noise, radioactive, solid waste etc are not part of the scope of this study due to lack of time, finance and resources at the disposal of the researcher. This study lasted for a period of three weeks. One week for a pilot study in the study area where the researcher distributed research instrument to 30 respondents to test its reliability. Also, the research instruments were administered and collected (data collection) within a period of two weeks.

1.8 Ethical Consideration

This research will be guided by rules and regulation of the research ethic. All the participants in this study will participate voluntarily. Researcher will be friendly and polite to the respondents, and maintained their confidential information.

1.9 Description of the Study Area

The study location and extent falls within the Western Senatorial Zone of Lagos State otherwise known as Lagos West Senatorial District alongside Agege, Alimosho, Ifako-Ijaiye, Badagry, Ojo, Ajeromi-Ifelodun, Amuwo-Odofin, Oshodi-Isolo and Ikeja Local Government Areas. Mushin is a local government area in Lagos State, with headquarters in Mushin. Mushin Local Government Area covers an area of 14.1 Km². The study area is bounded to the north by Oshodi-Isolo and Ikeja Local Government Areas, to the west by Oshodi-Isolo Local Government Area, to the south by Surulere Local Government Area, and to the east by Shomolu Local Government Area. Mushin Local Government Area is the 5th biggest local government area by population in Nigeria, and the 4th in Lagos State (National Population Commission 2006).

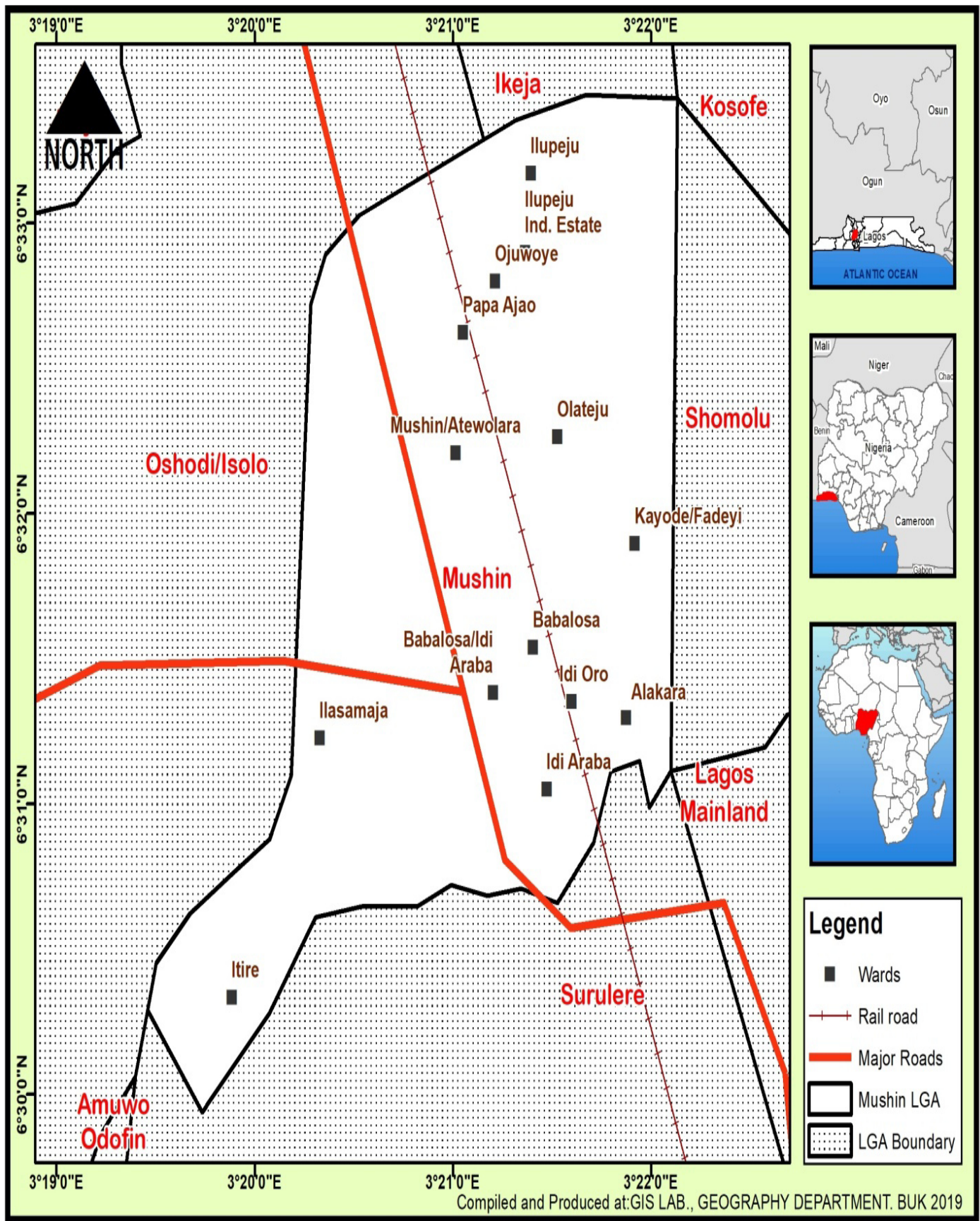


Figure 1: Mushin Local Government Area

Sourced from Lagos State Map, Redrawn in Bayero University, Kano. G.I.S Laboratory

The study area is situated in Mainland, Lagos and its geographical coordinate are 60⁰ 31 45 North, 30⁰ 21 18 East. It is located 10 Km north of the city core, adjacent to the main road to Ikeja which is largely a congested residential area with inadequate sanitation and low-quality housing.

1.9.1 Climate

Mushin Local Government lies on 6m above sea level and it has a tropical climate. The summers are much rainier than the winters in Mushin. The Köppen-Geiger climate classification is Aw. The average temperature in Mushin is 27.0 °C/80.6 °F. The annual rainfall is 1693 mm. The average hourly wind speed in Mushin experiences significant seasonal variation over the course of the year. The windier part of the year lasts for 4.3 months, from May 30 to October 8, with average wind speeds of more than 6.9 miles per hour. The average annual relative humidity is 84.7% and average monthly relative humidity ranges from 80% in March to 88% in June (Aremu, 2011).

1.9.2 Vegetation

The dominant vegetation of the area is the swamp forest of the fresh water and mangrove swamp forests, both of which are influenced by the double rainfall pattern of the state, which makes the environment a wetland region (Aremu, 2011).

1.9.3 Population and demographics

According to the 2006 census, Mushin has a population 633,543 with annual population growth of 2.9% people of the area include predominately Yoruba and various other ethnic group such as Hausa, Igbo, Nupe, etc who migrated into the town either for government work, commerce or for other activities, NPC (2006).

1.9.4 Language and Religion

The people religion is evenly distributed as there are significant Muslim and Christian in the area. While the Yoruba's are the largest group and civil servants, traders, and businessmen who engaged in different economic activities. The Igbos deal majorly in spare parts and the Hausas engaged in perishable food items and meat products, NPC (2006).

1.9.5 Socio- economic activities

Mushin is the site of a large industrial estate. Commercial enterprises include spinning and weaving cotton, shoe manufacturing, bicycle and motorized-cycle assembly, and the production of powdered milk. Agricultural produce is brought for sale in the large central market. The town is served by secondary schools and has a hospital, Aremu (2011).

1.9.6 Land Uses

Land use in the study area is dominated by industrial, residential and commercial activities. As such there is practically no reserve for farming land. The industrial, residential and commercial land use in the area has, in many cases, caused environmental pollution on the soil and groundwater. From this point of view, commercial facilities are considered nuisances, luring crowds, and creating congestion, all of which together reduce residents' quality of life, (Evelyn et al, 2015).

1.9.7 Landform and Relief

The landform of Mushin Local Government is plain in nature. There is no valleys and hills. Mushin Local Government has some islands and lagoons. The city itself sprawls close to Lagos Mainland and Victoria Island, connected to each other by a system of bridges (Nwana, 2009).

1.9.8 Soils and Drainage

The soil of the residential areas in Mushin Local Government Area were dominated by coarse particles of sand, with mean particle size distribution varying from 4.20 ± 0.6 to $7.00 \pm 0.5\%$ silt; 3.40 ± 0.3 to $4.60 \pm 0.4\%$ clay; and 88.4 ± 0.6 to $92.2 \pm 0.8\%$ sand. However, the drainage system in the study area is in bad situation. This is due to bad construction and maintenance. There is deviation in land use development from the original Lagos Master Plan in terms of real estate development with drainage system that are not properly integrated with the state wide flood control (channels/canals) system (Nwana, 2009).

1.9.9 Settlement Pattern

Mushin as a sub-urban settlement is a concentrated settlement that constitutes or is part of an urban area. It is an area with high density of human-created structures. These geometrical patterns are usually in squares and rectangles and are well laid out. It consists of various towns, administrative offices, cultural practices and industrial area (Nwana, 2009).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviewed related literature conceptualizing pollution, types of pollution, causes and effects of pollution, empirical review regarding pollution, as well as theoretical framework.

2.2 Operational Definition of Terms

- **Environment:** The term environment refers to the quantity and quality of natural resources, both renewable and non-renewable. It includes the ambient environment, which consists of the landscape, water, air and the atmosphere, and is a crucial determinant of human quality of life, as well as supporting human life. The state of the environment is a critical determinant of the quantity, quality and sustainability of human activities (Britannica and Oko, 2014).
- **Pollution:** According to Ekuri and Eze (1999) sees pollution as “a contamination, a defilement, mischief, perturbation and reduction in the value of an object or thing”. Relatedly, Jande (2005) describes the term Pollution“ to mean “to make something dirty or no longer pure, especially by adding harmful or unpleasant substances to it”. In this paper therefore, the concept, “Pollution“ is used to refer to a situation where waste-materials and/or harmful substances which can deplete, wear/tear away and affect the entire environment and cause disorderliness to all living organisms.
- **Environmental pollution:** is the undesired spread of toxic chemicals into the aquatic and terrestrial habitats of the world. Environmental pollution is the discharge of contaminant and pollutant into the environment in harmful way that cause damage to human, plant or animal life and is causing great damage to ecosystem, that depend upon the health of this

environment the most common pollutant are usually chemicals, garbage, and waste water, (Ogugbuage,2005). Environmental pollution means guarding all the surrounding condition which influences growth and development of air, water, land, atmosphere and space against pollution (Derid, 2000).

2.3 Conceptual Framework

2.3.1 Concept of Environmental Pollution

Pollution is the accumulation in the atmosphere of substance that in sufficient concentration endangers human health or produces other measure effects on living matter and other materials. Among the major sources of pollution are powered heat generation, the burning of solid wastes, industrial processes of pollutants are carbon monoxide from incomplete combustion engine and others are hydrocarbons, nitrogen oxides, sulphur dioxide and photochemical oxidants. Noise pollution is a composite of sounds generated by human activities ranging from blasting stereo system to the roar of transport vehicles. The most readily measurable physiological effect of noise pollution is damage of hearing, which may be either temporary or permanent and may cause distraction of normal activities or general annoyance.

Environmental pollution is not a modern phenomenon. Pollution by man in twentieth century is a reflection of development of technology and the resulting increase in living standards and consumption habits associated with economic growth. Man's relentless march towards "progress" has been so heavily dependent on science and technology that the natural environment stands almost transformed(Wile, 2000).The human quest for material "progress" seriously threatens the fragile eco-system. Most of our present day's environmental difficulties can be said originate from man's ecological misbehavior.

The environmental pollution arises when residual materials of economic activities are returned to the environment. This is because by nature environment has the capacity to assimilate and at the same time degrade the waste material, which it receives, and convert them into harmless or even useful forms. Sewage, for instance, up to a certain concentration is rapidly degraded by bacteria and made it harmless and is utilized as food by organisms. Once the assimilative capacity is exceeded, detrimental effects follow from further receipt of waste and that is the beginning of pollution (Burrows and Paul, 2006).

Environmental pollution is the discharge of contaminant and pollutant into the environment in harmful ways that causes damage to humans, plants or animal life, causing great damage to ecosystem, that depend upon the health of this environment the most common pollutant are usually chemicals, garbage, and waste water, (Ogugbuage, 2005).

McLaughlin (2007) stated that pollution as the introduction of contaminants into the environment that cause harm or discomfort to human or other living organisms, or that damage the environment, which can come in the form of chemical substance, or energy such as noise, heat, or light. Also pollution is the contamination of air, soil, water by the discharge of harmful substances. Pollution prevention Act of (1990), Pollution is deliberately or accidental contaminations of the environment with main waste either solid or liquid. It is also expressed as “matter in the wrong place” or anything released to the environment (Hopkin,2000). Environmental pollution is any discharge of materials or energy into water (short term) or choice (long term) detrimental to earth, ecological balance or that may however affect quality of life (Baijet, 2001). Nuisance and Nemesis (2002) defined environmental pollution as a substance which adversely affect the environment by changing growth rate of species. It also interferes with the food chain by it toxins, which at the end affects health comfort of people, generally,

pollutant is the contamination of air, soil, water by the discharge of harmful substances. Furthermore, environmental pollution is the introduction of different harmful pollutants into certain environment that makes this environment unhealthy to live in.

Environmental pollution means guarding all the surrounding condition which influences growth and development air, water, land, atmosphere and space against pollution (Derid, 2000). Udoudo (2006) observe that in some localities in Nigeria, especially among the Sub-urban districts of the Lagos region, one can hardly find modern toilet facilities. According to McLaughlin (2002) “Environmental Pollution” means the introduction by man into any part of the environment, of wastes, water energy or energy or surplus energy which so changes the environment directly or indirectly adversely to effect the opportunity of men to use or enjoy it.

According to Lagos state Environment Protection Act (1997), “Environmental Pollution” means the presence in the environment of any environmental pollutant”. They also stated that any solid, liquid or gaseous substance present in such concentration as may be, or tend to be, injurious to environment”. Environmental Pollution, lowering of environmental quality at local scale caused exclusively by human activities whereas environmental degradation means lowering of environmental quality at local, regional and global levels by both natural process and human activities. It is commonly agreed that pollution is, without doubt, the outcome of urban industrial technological revolution and rapacious and speedy exploitation of natural resources, increased rate of exchange of matter and energy and ever increasing industrial wastes, urban effluents and consumer goods (Williams, 2006).

In Nigeria for instance, the effects of oil in the fragile Niger Delta communities and environment have been enormous. Local indigenous people have seen little improvement in their standard of living while suffering serious damage to their natural environment. According to Nigerian

federal government figures, there were more than 7,000 oil spills between 1970 and 2000 (Vidal, 2016).

2.3.2 Types of Environmental Pollution

The classification of Environmental Pollution is a difficult task because the pollutants and the media through which the pollutants are transported are all inter-connected and inter-related. However, pollution may be classified from the point of view of object which is polluted. From different types of pollution are categorized based on the part of the environment which they affect or result which the particular pollution causes each of these types has its own distinctive causes and consequences categorized study pollution helps to understand the basics in more detail and produce protocols for the specific types. Types of pollution according to Kabir(2017) are: Land Pollution; Water pollution; Air pollution; Soil pollution; Thermal pollution; radioactive pollution; Noise pollution.

2.3.3 Land Pollution

It is caused mainly by unreclaim wastes; Industries contribute to chemical and thermal pollution. Litter and garbage from urban areas contain high proportions of non-biodegradable plastic material, highly toxic factory effluents are often dumped into pits which cause great damage. Soil is a living organic layer in dynamic equilibrium with and continually being replenished by rocks beneath it and air above it. Soil pollution affects in many ways. Industrial effluents leave residues in the soil impoverishing microorganisms which contribute to the ecology. The delicate chemical balance in the soil is thus disturbed(Meenakumari&Balakrishnan Nair, 1996).

Land can become polluted by household garbage and by industrial waste in Lagos central, north, and eastern zone, in the year 2010. Lagos state produced so many garbage's, consisting of product packaging, grass chippings, furniture, clothing bottles, food scraps, furniture, scraps,

newspapers, appliances, paints and batteries. That's about 1.02 pounds (0.95kg) of waste per person per day. According to Lagos state Environmental Protection.

2.3.4 Water Pollution

Water pollution is the contamination of water bodies (e.g. lakes, rivers, oceans and groundwater).

Water pollution occurs when pollutants are discharged directly or indirectly into water bodies without adequate treatment to remove harmful compounds. Water pollution affects plants and organisms living in these bodies of water; and, in almost all cases the effect is damaging not only to individual species and populations, but also to the natural biological communities.

As the name suggests, "water pollution" is the type of pollution that involves the contamination of various water bodies. Various aquatic creatures depend on these water bodies and its natural nutritious features to support its life.

Water pollution happens when chemical or dangerous foreign substance are introduced to water, including chemicals, sewage, pesticides and fertilizers from agricultural runoff, or metals like lead or mercury. According to Kasepa (2011), 25 percent of assessed stream miles, 36 percent of lakes and 20 percent of bay areas are not clean enough for fishing and swimming. The Kasepa(2011) also states that, the most common contaminants in the Lagos central, north, and eastern zone of Lagos state are bacteria, phosphorus, and nitrogen. These come from the most common sources of contaminants, which include agricultural runoff, air, deposition, water diversions and channelization of streams. Water pollution is not just a problem for Lagos central, north, and eastern zone of the Lagos state. According to Lagos State Environmental Protection Agency, about 285 thousand people do not have access to adequate sanitation. Adequate sanitation helps to keep sewage and other contaminants from entering the water supply(Kasepa, 2011).

2.3.5 Air Pollution

Air is the symptom of life. It governs the mechanism of Earth. Pollution of air is a dangerous threat to the earthly existence. Protection of air from pollution is as essential as the protection of life. “Air Pollution means the presence in the atmosphere of any air pollutant” and the latter denotes “any solid, liquid or gaseous substance, present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment (Holland and Bennett, 2001).

2.3.6 Soil/Land Pollution

Stripping soil of its natural fertility by using artificial chemicals like pesticides, insecticides, ripening agents etc. is known as “Soil Pollution” plants depend on the nitrogenous compounds present in the soil for their nutrition use of insecticides, pesticides and other artificial chemicals absorbs the nitrogen from the soil making it unfit for the growth for plants are responsible for holding the soil together firmly so, when the plants can’t grow the soil splits, leading to soil erosion(Hank & Peter, 2016).

The ultimate sink of all types of pollutants is land. The heavier air pollutants (dust, heavy metals, fly ash etc.) settle on earth surface due to gravitational effect while lighter gaseous pollutants come down through acid rain, smog or via direct reactions with plants, materials and soil.The land is directly polluted by solid waste disposal annually more than 1000 million tons of solid waste is thrown on earth surface all over the world(Pearce, 1991).

2.3.7 Thermal Pollution

Rise in the temperature in the ecosystem due the release of excessive heat energy into the environment by artificial methods or natural disasters is called “thermal pollution”. Generally, manufacturing industries release a lot of heat energy which gets transferred to the air and water

bodies. Even vehicles which have combustion engines release a lot of heat energy as they require high temperatures to function. Carbon dioxide has a property of blocking heat from existing the atmosphere and so the heat coming in from the sun is trapped in the atmosphere.

Thermal pollution results in a temperature rise which is the main cause for the melting of the polar ice caps, which is turn leading to a rise in the water levels thermal pollution has increased significantly since the eighteen hundreds resulting in a hotter earth (Ezikel, 2013).

Thermal pollution affects aquatic ecosystems in a variety of ways(Schell and Gallo, 2006). In general, the species composition changes as species tolerant of warmer waters replace those unable to adapt. This transition is often accompanied by as overall decrease in species richness. For example, attached algae in heated effluents were reported to show an increase in biomass but a decrease in the number of species represented. Fish can be particularly susceptible to effects of thermal pollution because their body temperature fluctuates with that of the surrounding water. For this reason, an increase in water temperature causes an increase in the metabolic rate of fish. This enhanced metabolism requires more oxygen(Schell and Gallo, 2006). Nuclear Hazards Radioactivity is produced by the spontaneous decay of the isotopes of some elements, whose nuclei are unstable. The radiation can take a number of different forms. In some cases it is as particles and in others it is electromagnetic. Five types of radiation may occur: alpha and beta particles, neutrons gamma rays and x-rays. An alpha particle is large, consisting of two neutrons and two protons, whereas a beta particle is an electron, while Gamma and X-rays have no mass.

2.3.8 Radioactive Pollution

Radioactive pollution occurs when radioactive' metals disintegrate releasing dangerous beta rays which can cause cancer and other mutative diseases. These types of pollution can occur by either the dumping of radioactive wastes from nuclear power plants into water bodies, damage of

nuclear reactors leading to radioactive contamination that would last for many years and many more in the second world war when the U.S.A attacked Hiroshima and Nagasaki of Japan, the atomic bomb left a radioactive footprint leading to highly mutative diseases. So, most of the people who survived the atomic bombing died eventually from cancers and mutations (WHO, 2015).

2.3.9 Noise Pollution

There are different qualities of sounds. The sounds which are not pleasant to hear are called 'Noises'. So an excess of noise in the outdoors leads to "Noise Pollution". This can be experienced by too many vehicles honking at the roads, heavy machinery being operated in the open (for example, a Jackhammer, trains clubs, over populated crowds and many more). Noise pollution is known to cause mental stress and depression. It can also cause damage to the ear drum which can cause deafness. Noise pollution has more of a psychological effect rather than a physical one (WHO, 2015).

2.3.10 Causes of Environmental Pollution

The causes of environmental pollution include the following:

- 1- Industries:** Industries have been polluting our environment especially since the beginning of the industrial revolution due to the increasing use of fossil fuels. In the 19th century and for a significant part of the 20th century, coal has been use to make machines work faster, replacing human force. Pollution cause by industries have significant effect on environment, soil and water contamination can also occur. This is particularly the case for power-generating industries, such as plants producing electricity, dam, a nuclear reactor or some other type of Plant. (Woodruff, 2010)

- 2- Transportation:** Ever since men abandoned animal power to travel, pollution of the environment has become higher and higher. Its levels have only been increasing until now. Similarly to industries, pollution caused by transport can mainly be attributed to fossil fuels. Indeed, humans went from horse carriages to cars, trains (which, before electricity, used to be propelled by coal), and air planes. As the traffic is increasing every day, pollution follows that evolution. (Woodruff, 2010).
- 3- Agricultural Activities:** Agriculture is mainly responsible for ‘the contamination of water and soil. This is caused by the increased use of pesticides. As well as by the intensive character of its production. Almost all pesticides are made from chemical substance and are meant to keep diseases and threatening animals away from the crops. However, by keeping these forms of life away, harm is almost made to the surrounding environment as well. Furthermore, as agriculture gets more and more intensive to feed the increasing world population, more environments and ecosystems are destroyed to make space for the crops. Some of them like rapeseed-used to make oil-demand a lot of space for a relatively small output. (Woodruff, 2010)
- 4- Trading Activities:** Trading activities including the production and exchange of goods and services. Concerning goods, pollution can be caused by packaging (which often involves the use of plastic, which is made from fossil fuels) or transport, mainly. (Woodruff, 2010)
- 5- Residences:** Finally, residential areas provide their fair share of pollution as well, to be able to build homes; natural environment has to be destroyed in one way or another. This is in case of Mushin Local Government of Lagos State where Wildlife and plants are driven away and replaced by human constructions. As it requires the work of industries,

construction itself is also a source of contamination of the environment. Then, when people settle in, they will produce waste every day, including a part that cannot be processed by the environment without harm.

6- Urbanization: As the population moves from the villages towards the town and the city, urban city like Lagos state will face lack of quality water and constant sanitation, affordable housing, roads, public transport and clean air. According to the 2001 census, about 285 million people live in urban areas. By 2015, half the country's population is expected to be city-based and there will be over 50 cities with a population of one million and above. Urbanization while having a positive impact on income levels, employment and production economics has brought with it many problems including a shortage of housing, inadequate water supply, sanitation and waste disposal facilities, congestion, traffic problems, air, water and noise pollution as well as an unsafe social environment. The overall quality of urban environment has deteriorated over the years with the largest cities reaching, saturation points and unable to cope with the increasing pressure on their infrastructure.

2.3.11 Effects of Environmental Pollution

One of the greatest problems, that, the world is facing today is that environmental pollution increasing with every passing year and causing grave and irritable damage to the earth. Air pollution is by far most harmful form of pollution in our environment. Air pollution is cause by the injuries smoke emitted by cars, trains and factories. (Nwana, 2009) Smoke from burning leaves and cigarettes are harmful to the environment causing a lot of damage to man and the atmosphere. Evidence of increasing various flora and fauna. And water pollution cause by industrial waste products released into takes, rivers, and other water bodies, has made marine life

no longer hospitable. Human pollute water with large scale disposal of garbage, flowers, ashes and other household waste. In many rural areas one can still find people bathing and cooking in same water, which is all these can affect the human healthy life. And also noise pollution, soil pollution, and light pollution too, are the damaging the environment at an alarming rate. Noise pollution include aircraft noise, noise of cars, vehicles horns, loudspeakers and industry noise, as well as high- intensity sonar effects, which are extremely harmful for the environment. And soil contamination as a result of acid rain, polluted water, fertilizer etc, which leads to bad crops. Soil contamination occurs when chemicals are released by spills or underground storage tank pollution includes light trespass, over illumination and astronomical interference are all the effect of environmental pollution causes the following problems: -

Environmental Pollution can kill many organisms including human. Ozone pollution can cause respiratory disease, cardiovascular disease, throat inflammation, chest pain and congestion. Water pollution causes approximately 14,000 deaths per day mostly due to contamination of drinking water by untreated sewage in developing countries. Noise pollution induces losses, high blood pressure, stress and sleeping disturbance mercury has been linked to developmental deficits in children and neurologic symptoms. Generally, pollution courses degradation and damage to the natural function of the biosphere.

- 1- Damage to human health caused by specific chemical substance present in air, food, water and radioactivity.
- 2- Damage to the natural environment, which affect vegetation, animal, crops, soils and water.
- 3- Damage to the aesthetic quality of the environment caused by smoke, chemical fumes, dust, noise, the dumping of waste and rubbish and direction. www.uccee.org//eviro.com

1. Effects on Humans

The effect of environmental pollution on humans is mainly physical, but can also turn into neuro affections in the long term. The best-known troubles to us are respiratory, in the form of allergies, asthma, irritation of the eyes and nasal passages, or other forms of respiratory infections (Tropical Rainforest Animals, 2008).

Notably, these well spread effect can be observed when air pollution is high in cities, when the weather gets hot, for instance, environmental pollution has been proven to be a major factor in the development of cancer. This can happen for example when we eat reminiscences of pollutants used in the production of processed foods, or pesticides from the crops other, rarer, diseases include hepatitis, typhoid affections diarrhea and hormonal disruptions. (Tropical Rainforest Animals, 2008).

2. Effects on Animals: -Environmental pollution mainly affects animal by causing harm to their living environment, making it toxic for them to live in. acid rains can change the composition of rivers and seas, making them toxic for fishes, an important quantity of ozone in the lower parts of the atmosphere can cause lung problems to all animals Nitrogen and phosphates in water will cause overgrowth of toxic algae. Preventing other forms of life to follow their normal course. Eventually, soil pollution will cause harm and sometimes even the destruction of microorganisms, which can have the dramatic effect of killing the first layers of the primary food chain. (Tropical Rainforest Animals, 2008).

3. Effects on Plants: -As for animals, plants, and especially trees, can be destroyed by acid rains (and this will also have a negative effect on animals as well, as their natural environment will be modified), ozone in the lower atmosphere block the plant respiration, and harmful pollutants can be absorbed from the water or soil. (Tropical Rainforest Animals, 2008).

4. Effects on the Ecosystem: -In short environmental pollution, almost exclusively created by human activities has a negative effect on the ecosystem, destroying crucial layers of it and causing an even more negative effect on the upper layers. (Tropical Rainforest Animals, 2008).

2.3.12 Control Measures of Environmental Pollution

In Nigeria, Federal Ministry of Health and Environment (2005) take a major step in avoiding environmental pollution. Air pollution represents another source of detriment to growth and development, compounds such as carbon monoxide sulfur dioxide and nitrogen dioxide all have the potential to cause serious damage when inhaled by expected mother.

According to the Federal Ministry of Health and Environment report that maternal mortality high rate come as a result of low birth weight, present birth, intrauterine growth retardation, and congenital abnormalities have all been found to be associated with fatal exposure to air pollution.

The national policy on environmental sanitation (2005) stated that to minimize the effect of water pollution appropriate use of land scale under drain helps to minimize subsequent water pollution/flooding generated. However, the magnitude of such problems has remained the vigour of the federal government to adopt and commit itself to a multi sector that impact upon the epidemic or to be affected in the effect. This was done through the establishment of National Orientation Agency (NOA), NAFDAC etc. This entire agency coordinated the action of ministry of water resources and the effect of water pollution in the community.

2.4 Theoretical Framework

2.4.1 Ecological Perspective of Change and Development Theory

An ecological perspective of change and development: The perspective is associated with the works of (Wilkinson and Bounding 2003). The theory is concerned with issues of change and development in contemporary societies, especially as they relate to environmental changes

and/or ecologically related trends of population growth and the need to devise and sort out techniques of tackling development problems. The theory states that, as the population of a society increases in size, individual members of the society exert more pressure on scarce available resources such as land and other natural endowments for survival. They directly or indirectly carryout socio- economic activities that pollute the environment/society, and further cause harm (degradation) to the environment which have direct or advance effect on human health. The socio-economic activities, according to these theorists include subsistence agricultural activities of people in agrarian societies such as Africa, Latin America etc. and the commercial and industrial activities of people in Urban- industrialized societies (like Mushin Local Government Area of Lagos State). However, the perspective further argued that development is needed when a society out grow its resource base and productive system. The perspective therefore posits that as the established economic system of a given environment/society is proved inadequate and productive system becomes more problematic, societies are therefore driven to change their methods. For instance, as the population of a society outgrows the available resources, especially in agrarian societies, people are forced to migrate to urban centres/cities in search of job opportunities. As a result of lack of employment or policies, some engage in several commercial activities with little or no consideration to the environment and thereby contributed or lead (as a result of their activities) to various environment pollution such as water, air, land, etc. Some still carry out some technical and entrepreneurial businesses all for survival. The urban and city dwellers establish and carryout industrial activities that equally pollute the society. Wilkinson and Bounding conclude that these activities directly and/or indirectly pollute the environment with its attendant consequences on biodiversity.

2.5 Empirical Studies

The concept of environment is as old as the concept of the nature itself. It is a composite term referring to conditions in which organisms consisting of air, water, food, sunlight etc., thrive and become living sources of life for- all the living and non-living beings including plant life. The term also includes atmospheric temperature, wind and its velocity. The significance of environmental factors to the health and well-being of human populations' is increasingly apparent (World Health Organization (WHO), 2010b). Environment pollution is a worldwide problem and its potential to influence the health of human populations is great (Fereidounet *al* 2007). Pollution reaches its most serious proportions in the densely settled urban-industrial centers of the more developed countries (Fereidounet *al* 2007).

In a study conducted by Mashhood and Arsalan(2011)on Environmental Pollution: Its Effects On Life And Its Remedies, the paper provides an insight view about the effects of environment pollution in the perspective of air pollution, water and land/ soil waste pollution on human by diseases and problems, animals and trees/ plants. Study finds that these kinds of pollutions are not only seriously affecting the human by diseases and problems but also the animals and trees/ plants. According to author, still time left in the hands of global institutions, governments and local bodies to use the advance resources to balance the environment for living and initiates the breathed intellectuals to live friendly with environment. As effective reply to contamination is largely based on human appraisal of the problem from every age group and contamination control program evolves as a nationwide fixed cost-sharing effort relying upon voluntary participation Sharp and Bromley(1979). Keywords: Environment Pollution; Air Pollution; and Water Pollution. However, the research is relevant to the current study because it was about environmental pollution carried out to its effect on human and animal and provides solution

possibly to mitigate the problem. Therefore, the research failed to take into consideration people opinion and perception of the effect environmental pollution in other to find lasting solution the menace. This study is however aimed to breach this gap by identifying the cause of environmental pollution and through people opinion gathering and proffer everlasting solution to the problems of environmental pollution faced by people living in Sub-urban of Mushin Local Government Area of Lagos State, and to find possible means of controlling and managing the environment for the healthy living of the society.

A study was also conducted by Evelyn, Ityavyar and Tyav (2015) on the topic “Environmental Pollution in Nigeria: The Need for Awareness Creation for Sustainable Development. The paper examined the issue of environmental pollution and its attendant consequences on the Nigerian society. In doing so, the paper has on the basis of personal observation and secondary sources examined the effects of environmental pollution in Nigeria. The findings show that environmental problems in Nigeria generally are many, diverse in nature, and are caused by man’s interaction with nature (environment) for exploits in a number of ways-both in the cities; where industrial activities predominate, and rural areas; where agriculture thrives. The paper posits that man utilizes air for survival, harnesses land and water resources for domestic, commercial, industrial, agricultural and other purposes. Through these activities; man directly and/or indirectly creates problems which are detrimental to his health/survival, wellbeing, natural existence and stability. The paper observes that these problems are a consequence of environmental pollution which also degenerates into environmental degradation and several other hazards such as widespread epidemics, depletion of natural habitats, and thus; impede the socio-economic development of Nigeria as a nation. The paper recommends awareness creation and change in attitudes for effective environmental and resources management strategies as a

way forward. The study place emphasis in the factor of environmental pollution, as it's recommended. This study will however seek for people awareness on the growing effects of environmental pollution on their wellbeing. The study will also proffer possible solution to curb the current menace that the people of Mushin Local Government are currently facing as a result environmental pollution effect on the environment.

In a similar study conducted by Muhammad, Idrees and Sami(2013) on "A Sociological Study of Environmental Pollution and Its Effects on the Public Health Faisalabad City". The study was designed to find out the sources, and, to analyze the harmful effects, of environmental pollution on the human health. The study revealed that Polluted environment adversely introduces the harmful effects on the health of human beings. Nitrogen oxides, Sulpher dioxide, Carbon Monoxide, Ammonia and Ozone are the major air pollutants. When the concentration of the pollutants in the air becomes high from a certain level, the resultant effects may cause a degree of difficulties regarding human health specially the severe breathing problems leading to maximum as even the deaths may occur. The present study was conducted in the Faisalabad city i.e. an industrial hub of Pakistan. There are many Textile and leather industries in the surrounding of city that continuously adding smoke and harmful gases in the air that create problems for the human health and damage the natural environment as well. Survey method is used for data collection. 120 respondents were interviewed from Faisalabad city by using interview schedule as a tool of data collection. Data was collected during November-December 2012 and the collected data was analyzed by using SPSS. Chi-square, correlation and gamma test was applied to check the association between the variables. Different variables checked related to causes and effects of environmental pollution. The study is also relevant to this study because of its emphasis on environmental pollution and its effect on human health. So far in the study, there

is little or no attention given to the cause of the environmental pollution. This study will be unique because of its focused in exploring the root cause of environmental pollution and seeking to investigate the public perception on the effect of environmental pollution.

Obafemi, Eludoyin and Akinbosola (2012) studied “Public Perception of Environmental Pollution in Warri, Nigeria”. The study assessed the public perception on the environmental pollution profile in Warri Township. Data were acquired by administering questionnaire among the residents of study area using random sampling method and descriptive statistics was used to explain the frequencies of variables being expressed in percentages. The result of the analysis showed that 72.4% of total respondents affirmed that air pollution was greatest among other types of pollution while the major source of pollution was oil spillage and gas flaring and there is no time that pollution cannot occur as 52.6% of respondents agreed on this. Environmental resources were believed to be partially and totally damaged suggesting that the degree of pollution was high. Furthermore, 26.4% and 14.5% of respondents believed that water pollution leads to loss of aquatic lives and reduction of potable water. Cough disease was believed to be really affecting the entire people of the area as 19.7% and 44.7% of total respondents agreed that water pollution and air pollution respectively caused the disease. However, 96.1% had the opinion that soil pollution caused stunted growth of plants. The study therefore suggested among others that government should promulgate and enforce environmental laws that will reduce the level of pollution in the area, planting of trees should be encourage, gas flaring should be stopped and adequate facilities of transporting petroleum products should be put in place. The research investigated Public Perception of Environmental Pollution in Warri, therefore this set out to investigate similar study which is characterize with industrial activities and higher pollution. The

solution provided in this may be difference from the previous research due to differences in geographical area of study.

2.5.1 Public Perception of Environmental Pollution

Public perception of environmental was revealed in a study conducted Obafemi, Eludoyin & Akinbosola, (2012) on “Public Perception of Environmental Pollution in Warri, Nigeria”. The study presented the types, sources and occurrences of pollution in the study area. Of the total respondents, 72.4% affirmed that air pollution is being experienced in the area while 11.8% and 9.2% believed that the area is plagued with soil pollution and water pollution respectively. These are the types of pollution experienced in the area and through the responses from the respondents; it is evident that air pollution was the commonest among others. The result of the analysis corroborated with the findings of Makino (2009) and Obafemi (2004) that pollution of the environment is in different categories which can be land pollution, air pollution, noise pollution and water pollution. However, air pollution was observed to be in higher rate than others. The reason may be attributed to carbon-monoxide (CO), methane (CH₄) and nitrogen (iv) oxide (NO₂) that are emitted from the industries and also from the vehicles. Teri Shriram Institute for Industrial Research (1999) submitted that chemical industry is a major source of air pollution and the main pollutants are Carbon dioxide (CO₂), Carbon monoxide (CO), Sulphur dioxide (SO₂) and Nitrogen dioxide (NO₂).

It is also revealed that there are three major sources of environmental pollution in the study area and these included improper waste disposal, oil spillage and gas flaring; and ejection of carbon monoxide into the atmosphere. The total respondents, 21.1% and 46.1% submitted that the sources of pollution in the area were mainly through improper disposal of waste and oil spillage respectively while 23.3% believed that it was through the injection of carbon monoxide into the

atmosphere. Improper waste disposal would have great effects on both soil and water especially for those dumpsites located at the fracture that water passes and thereby the pollutants are transferred along this passage to pollute the soil and eventually the groundwater. Gas flaring is a wasteful emission of greenhouse gases that increases global warming and according to Shell (1999); Nigeria currently flares more gas than any other country in the world. Oil spillage was discovered to be a major source that caused most of the pollution in the area. This would have affected both soil and water whereby the microorganisms and aquatic lives would have been affected. Oil spillage may be attributed to sabotage by community members, corrosion from company facilities, ageing of the pipes and human/technical errors. When and whenever pollution is generated, its resultant effects have serious implication for the different spheres of the environment. Cantor (1997) revealed that industrial effluents, agricultural runoffs, transport, burning of fossil fuels, animal and human excretions, geologic weathering and domestic waste contribute to the metal levels in water bodies. This is also corroborated in Nduka and Orisakwe (2009) study which revealed that rapid urbanization and industrialization of Warri and its environs between 1968 and 1990 created pollution potentials that are as high as the sources of pollution. Egboge (1995) complained that the rivers, estuaries, creeks and air have been contaminated for decades. Thus, the aquatic lives are subjected to great danger and according DWAF (1996), discharge of some metals into natural waters at increased concentration in sewage, industrial effluent or from mining and refining operations, can have severe toxicological effects on aquatic environment and humans.

The result of the analysis on the rate of occurrence of pollution in the study area vividly revealed that 26.3% of total respondents agreed that pollution occurs every week, while 9.2% and 11.8% agreed that it occurs every month and every year respectively. However, 52.6% agreed that

pollution can occur on a weekly, monthly and yearly basis. On this note, it may be concluded that all the types of pollution identified in the study area can be experienced at any time if care is not taken.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter discusses the methodological approach adopted in the conduct of the study, under the following sub-heading: Introduction, Research Design, Types and sources of data, Population and Sampling Techniques, Tools for Data Capturing/Collection, Method of Data Collection, and Method of Data Analysis.

3.2 Pilot Study

A pilot study was conducted in Mushin Local Government Area using a sample of 30 respondents. The result from the pilot study was used to ascertain the validity and reliability of the research instrument.

3.3 Research Design

This research work used survey research design to collect and gather relevant data. This is because the study is concerned with human opinion, perception as well as interpretation of event.

3.4 Types and Sources of Data

In this study, the researcher employed two instruments for data collection which are questionnaire and semi-structured interview guide. The purpose of the interview was to provide an opportunity to facilitate triangulation of data and enhance confidence in the result of the study as well as the collection of comprehensive data. Questionnaire as an instrument for data collection was a researcher developed questionnaire. The interview was conducted face-to-face with some respondents who were industrial workers and market women met at the study area during the time of data collection.

3.5 Population and Sampling Techniques

This research project covers Mushin Local Government area. Mushin Local Government Area consist of two Constituencies (first constituency has 8 wards which include Alakara, Idi-oro/Odi-olowo, Babalosa, Ojuwoye, Ilupeju, Olateju, Kayode/Fadeyi and Ilupeju/Industrial while second constituency has 6 wards which include Mushin/Atewolara, Papa Ajao, Ilasamaja, Babalosa/Idi-Araba, Itire and lastly Idi-Araba making a total of 14 wards). The total population of the study according to the 2006 census is 633,543.

Furthermore, Simple random sampling techniques was used for this research, sample size for this study is 384 which was obtained using Krejcie and Morgan formula. Which was given as:

$$s = \frac{x^2 NP(1-P)}{d^2 (N-1) + x^2 P(1-P)}$$

s : required sample size.

X^2 : the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N : the population size.

P : the population proportion (assumed to be .50 since this would provide the maximum sample size).

d : the degree of accuracy expressed as a proportion (.05).

$$s = ?$$

$$x^2 = 3.841$$

$$N = 633,543$$

$$P = 0.5$$

$$d = 0.05$$

$$s = \frac{x^2 NP(1-P)}{d^2 (N-1) + x^2 P(1-P)}$$

$$s = \frac{3.841 \times (633,543) \times (0.5) \times (1-0.5)}{(0.05)^2 \times (633,543-1) + 3.841 \times 0.5(1-0.5)}$$

$$s = \underline{608359.67}$$

$$1583.855 + 0.96$$

$$s=384$$

However, the 384 (Table 3) was drawn using simple random sampling method to give equal chance of being selected to all members (Krejcie & Morgan, 1970).

Table 3.5 Distribution of Sample Size

S/N	Wards	Population	Sample
1	Illupeju	57,019	35
2	Illupeju Industrial Estate	38,013	23
3	Ojuwoye	88,696	54
4	Papa Ajao	38,013	23
5	Mushin/Atewolara	50,683	31
6	Olateju	12,671	8
7	Kayode/Fadeyi	69,690	42
8	Babalosa	12,671	8
9	Babalosa/Idi Araba	38,013	23
10	Idi Oro	57,019	35
11	Alakara	6,335	4
12	Ilasamaja	25,342	15
13	Idi Araba	63,354	38
14	Itire	76,025	46
	Total	633,543	384

Source: NPC (2006), Krejcie and Morgan (1970)

Nonprobability sampling was used to distribute the questionnaire to the respondents found at the time of data collection. Nonprobability sampling is the type of sampling method that relies on the data collection from population members who are conveniently available to participate on the study. However, the questionnaires were distributed to the respondents (met accidentally in the study area) by the researchers with aid of research assistance who guided the respondents well

necessary. The researcher waited while the respondents took their time filling the questionnaires. The questionnaires were collected immediately after completion by the respondents.

3.6 Tools for Data Capture/Collection

The data were gathered using questionnaires based on 5-point Likert's scale consisting of Strongly Agree (5), Agree (4), Undecided (3), Disagree (2), Strongly Disagree (1) and in-depth interview. A research questionnaire was designed to obtain data from the respondent on the topic under examination. The questionnaires were distributed to the respondents found at the time of data collection with the aid of research assistant from the local government. The information gathered through the administered questionnaires and in-depth interview with some industrial and market women brought out the opinion of the respondents on the effects of environmental pollution in the area.

3.7 Method of Data Collection

The service of two research assistants was employed. The researcher together with the assistants visited the study area to administer the questionnaire. The research assistants distributed the questionnaire while the researcher handles the interview session with ten respondents among some industrial workers and some market woman.

The respondents (the residents) were given some time to fill the question and which it was retrieved on the spot. For the interview the researcher had a thirty minutes session with the respondent and write down their responses

3.8 Validity of the Instrument

The validity of the research instrument for this study was established by the researcher's supervisor an expert in the field of Earth and Environmental Sciences Department and lecturers from Geography Department in Bayero University, Kano in order to establish the face and

content validity as well as appropriateness and relevance of the instrument in measuring what is intended to measure. Their observations were adopted before going to the research field.

3.9 Reliability of the Instrument

The data collected from the pilot study using a sample of 30 respondents was used to test for internal consistency of the instruments. Reliability of the two instruments the questionnaire and the structured interview for this study was determined using the Cronbach alpha reliability coefficient. The Cronbach alpha method of reliability was used as it is the most appropriate for the study. The reliability of the questionnaire was found to be 0.703 and that of interview was 0.805 respectively. This indicates that the instruments were found to be adequately reliable and therefore appropriate for this study.

3.10 Method of Data Analysis

Data collected for this study was analyzed using simple percentage and frequency table. Charts were also used where appropriate for presentation. Regression analysis was used to test the study hypothesis; the statistical instrument was employed to analyze the questions and transformed into meaningful statistical data in percentage using statistical packages for social science (SPSS).

3.10.1 Variables and their Measurements

This study has two variables; they are the dependent variable and the independent variables. The

3.10.2 Dependent Variable

Environmental pollution (ENVP) which is pollution from all source and all form is used as the dependent variable. Environmental pollution is proxied as the general perceptions of the present of the different environmental pollution.

3.10.3 Independent Variables

The driver variables of the independent variables are:

i. Air Pollution (AIRP)

Air pollution is proxied by the respondents perception towards different causes and modes of air pollution emanating from activities that leads to air pollution within their environment.

ii. Land pollution (LANDP)

Land pollution is measured as the respondent’s perception towards different causes and modes of land pollution emanating from activities that leads to land pollution within their environment.

iii. Water Pollution (WATERP)

The independent variable is land pollution measured as the respondent’s perception towards different causes and modes of land pollution emanating from activities that leads to land pollution within their environment.

3.11 Techniques of Data Analysis

The study will use the descriptive statistics, multiple linear regressions and correlation suitable for the data analysis.

3.11.1 Multiple regressions Analysis

Multiple regression analysis is an extension of simple regression analysis, because in multiple regression analysis, more than one independent variable are used to determine the dependent variable. Variables that are being determined, predicted or explained by mathematical equation is referred to as dependent variables, while the variables used in determining or predicting is called the independent variable. Thus, any regression model that involves more than one independent variable to a single variable is called multiple regression analysis (Aminu, 1995).

3.11.2 Models Specification

The study will adopt the regression model

$$Y = a + bX.....(1)$$

This is modified for the study thus

$$\text{ENVP}_{it} = \beta_0 + \beta_1 \text{AIRP}_{it} + \beta_2 \text{LANDP}_{it} + \beta_3 \text{WATERP}_{it} + E_{it}$$

Where:

ENVP= Environmental pollution

AIRP = Air pollution

LANDP = Land pollution

WATERP = Water pollution

E_{it} = Error term

CHAPTER FOUR

RESULT AND DISCUSSION

4.1 Introduction

In this chapter, the data obtained during the field survey were analyzed and presented here. The presentation is based on the set objectives of the study.

4.2 Data Analysis and Presentation

In the course of collecting data for this study, the researcher distributed 384 questionnaires, 358 were recovered and used for the analysis.

4.2.1 Socio Demographic Distribution of Respondents

The socio demographic distribution of respondents is presented in this section based on the data obtained from the field survey. The demographic distributions of the respondents are presented in Table 4.1

Results presented on 4.1 show demographic distribution, whereby the majority of the respondents are male. 64% of the total respondents are male while the remaining 36% of the total respondents are female. This shows that both genders are well represented though more males participated in the survey than females. The high representation of females is due to the fact that Mushin is a circular community where the culture does not restrict the female from partaking in social and economic activities. This means that the female in the study area has freedom to partake in any social, economic, political and religious activities of the community.

Table 4.1 Socio demographic distribution of the respondents

Variable	Frequency	Percentage %
Gender		
Male	228	64%
Female	130	36%
Total	358	100%
Age		
Below 21 years	30	8%
21 - 30 years	170	47%
31 - 40 years	130	36%
Above 40 years	28	8%
Total	358	100%
Educational Qualification		
No Education	2	1%
Primary Education	3	1%
Secondary Education	47	13%
OND/HND	181	51%
Graduate qualification	122	34%
Postgraduate	3	1%
Total	358	100%
Marital Status		
Single	86	24%
Married	188	53%
Widowed	82	23%
Divorced	2	1%
Total	358	100%
Occupation		
Civil servant	81	23%
Private/factory worker	123	34%
Trader/ business owner	97	27%
Apprentice	33	9%
Student	22	6%
No work at all	2	1%
Total	358	100%

Result further shows that majority of the respondents are youth below the age of 40 years, 48% of the total respondents which are the majority are between the ages of 21 - 30 years, while 36% of the total respondents are between the age of 31-40 years. Only 8% of the respondents are

between the ages of 15-20 years while also 8% of the total respondents are above the age of 40 years. This implies that majority of the respondents are matured youths and can provide informed and independent decision on the questions in the questionnaire.

While majority of the respondents (50%) possess Higher National Diploma (HND)/ National Diploma (OND) as their highest academic qualification, 34% has graduate qualification (Bachelor Degree) as their highest qualification, 13% has secondary school while only 1% possesses primary education, no education at all and postgraduate qualification respectively. This shows that majority of the respondents has the minimum academic qualification. It also shows that the survey does not discriminate against the non literate as both literate and non literate participated in the survey. Result further shows that majority of the respondents are married. 53% of the total respondents are married, 24% are single, 22% are widow while only 1% of the total respondents are divorced.

In addition, majority of the respondents (26%) are private/factory workers, 27% are traders/business owners while 23% of the total respondents are civil servants. 8% are apprentice, 6% are students while only 1% of the total respondents have no work at all. This signifies that majority of the respondents engage in activities that can result to pollution thereby having a good understanding of the subject matter.

4.2.2 Causes of environmental pollution in the Sub-urban District of Mushin LGA

Environmental pollution is the discharge of contaminant and pollutant into the environment in harmful way that cause damage to human, plant or animal life and is causing great damage to ecosystem. Therefore, the table below presents findings on the major causes of environmental pollution in the study area.

Table 4.2 Causes of Environmental Pollution in the Sub-urban District of Mushin Local Government Area of Lagos State

S/N		<i>Weighted Average</i>	<i>Strongly Agree</i>	<i>Agree</i>	<i>Undecided</i>	<i>Disagree</i>	<i>Strongly Disagree</i>
1	Bad odour arising from open dump site	92%	221 (62%)	133 (37%)	3 (1%)	1 (0%)	0 (0%)
2	blocked drainages and canals	83%	124 (35%)	189 (53%)	24 (7%)	13 (4%)	8 (2%)
3	Smokes from automobile engines	75%	44 (12%)	237 (66%)	38 (11%)	24 (7%)	14 (4%)
4	Discharge of gasses into the air like smokes from industries	70%	37 (10%)	188 (53%)	74 (21%)	33 (9%)	26 (7%)
5	Transportation which involves excessive movement of vehicles	55%	22 (6%)	84 (23%)	99 (28%)	97 (27%)	56 (16%)
6	Animal farming and improper disposal of animal wastes can go a long way in reducing the quality of the environment	51%	33 (9%)	67 (19%)	47 (13%)	122 (34%)	89 (25%)
7	Excessive noise	54%	28 (8%)	87 (24%)	66 (18%)	97 (27%)	80 (22%)
8	Population growth which involves congestion of people and houses	41%	8 (2%)	28 (8%)	28 (8%)	206 (58%)	88 (25%)
9	Deforestation activities involving the felling of trees.	63%	53 (15%)	118 (33%)	69 (19%)	74 (21%)	44 (12%)
	Total	65%					

Results on 4.2 show the causes of environmental pollution in the Sub-urban District of Mushin Local Government area of Lagos State. This average score reveals that the aforementioned variables are significant causes of environmental pollution in the Sub-urban District of Mushin Local Government area of Lagos State.

With a weighted average score of 92%, result shows that majority of the respondents are of the opinion that bad odour arising from open dump site. 62% of the total respondents strongly agree, 37% agree while only 1% was undecided. Similarly, blocked drainages and canals is opined by majority of the respondents as a causes of environmental pollution in the study area as majority of

the respondent strongly agreed with the statement with a weighted average score of 83%. Majority of the respondents are also of the opinion that smokes from automobile engines is a cause of environmental pollution. 237 respondents representing 66% of the total respondents agreed, 12% strongly agree, 11% were undecided, 7% disagreed and only 4% strongly disagree with the statement. Majority of the respondents also agreed that discharge of gasses into the air like smokes from industries with a weighted average of 70%.

However, there were mixed feelings among the respondents on if transportation which involves excessive movement of vehicles is a cause of environmental pollution as only 6% of the total respondents strongly agreed, 23% agree, while 28% were undecided, also, 27% of the respondents disagree and another 16% strongly disagree that transportation which involves excessive movement of vehicles is a cause of environmental pollution in the study area. Similarly, question on if animal farming and improper disposal of animal wastes can go a long way in reducing the quality of the environment was also met with mixed responses from the respondent, majority of the respondents (34%) disagreed with the statement, 25% of the respondents strongly disagree, 19% agreed, 13% undecided while only 9% of the total respondents strongly agreed with the statement. Similarly, Excessive noise, Population growth which involves congestion of people and houses and Deforestation activities involving the felling of trees are not seen as major causes of environmental pollution as they have a weighted average score of 54%, 41% and 63% respectively.

This average score reveals that the items listed are significant causes of environmental pollution in the Sub-urban District of Mushin Local Government Area of Lagos State. Result from the in-depth interview conducted shows that majority of the respondents are aware of the causes of environmental pollution in the area. Most of them are of the opinions that block

drainage, poisonous exhaust from cars and bush burning are the major causes of environmental pollution, and this is in line with the findings of Obafemi, et al (2012), who found that environmental pollution degraded by the injuries smoke emitted by cars, trains and factories.

Causes of environmental pollution: based on the interview conducted with respondents on the causes of environmental pollution in the study area, one female respondent of Illupeju Industrial Estate explained that:

Environmental pollution has been the major problem faced in this community for long period of time without proper measure put in place. She stated that, lack of dumping of refuse cause land pollution and proper drainage in the community cause air pollution especially during raining Halimat (from Ojuwoye ward) stated that there use to be bad ordour/ smelling in some of the areas in Mushin Local government which they attributed to lack of proper disposal of refuse, emission of gases from the industries, dumping of refuse into the gutter etc.in the study area.

The results of this analysis corroborated with the findings of Makino (2009) and Obafemi (2004) that pollution of the environment is in different categories which can be land pollution, air pollution, noise pollution and water pollution. However, air pollution was observed to be in higher rate than others. The reason may be attributed to carbon-monoxide (CO), methane (CH₄) and nitrogen (iv) oxide (NO₂) that are emitted from the industries and also from the vehicles. Teri Shriram Institute for Industrial Research (1999) submitted that chemical industry is a major source of air pollution and the main pollutants are Carbon dioxide (CO₂), Carbon monoxide (CO), Sulphur dioxide (SO₂) and Nitrogen dioxide (NO₂).

The study of Obafemi (2012) also revealed that there are three major sources of environmental pollution in the study area and these included improper waste disposal, oil spillage and gas flaring; and ejection of carbon monoxide into the atmosphere. Of the total respondents, 21.1% and 46.1% submitted that the sources of pollution in the area were mainly through improper disposal of waste and oil spillage respectively while 23.3% believed that it was through the

injection of carbon monoxide into the atmosphere. Improper waste disposal would have great effects on both soil and water especially for those dumpsites located at the fracture that water passes and thereby the pollutants are transferred along this passage to pollute the soil and eventually the groundwater. Gas flaring is a wasteful emission of green house gases that increases global warming and according to Shell (1999); Nigeria currently flares more gas than any other country in the world. Oil spillage was discovered to be a major source that caused most of the pollution in the area.

The results also support the findings of Muhammad, et al (2013), who found that emissions from vehicles contribute to photochemical smog, especially in areas that experience high traffic density such as central business districts.

4.2.3 Perception on the Effects of Environmental Pollution

This section presented the people’s perception on the effects of environmental pollution in the study area.

$$\text{Environmental pollution} = \beta_0 + \beta_1 \text{Air pollution} + \beta_2 \text{Water pollution} + \beta_3 \text{Land pollution} + \epsilon_i$$

..... (i)

Table 4.3: Perception on the Effects of Environmental Pollution in the Study Area

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta	T	
1	(Constant)	-7.341	1.639		-4.479	.000
	Land	1.067	.207	.284	5.148	.000
	Water	.690	.320	.118	2.157	.032
	Air	-.691	.264	.142	2.620	.009

a. Dependent Variable: Environmental pollution

Result shows that the r-square which is the coefficient of determinant is 0/179 indicating that variations in the dependent variable can be explained by only approximately 20% of the independent variables, the implication of this is that the independent variable (Air pollution, Land pollution and Water pollution) can only explain 20% of the variation in Environmental pollution, the remaining 80% can be explained by variables not covered in this study.

Table 4.2.3 presented the effects of environmental pollution in the study area. The result shows that air pollution with a coefficient of -0.691 and a p-value of 0.009 has a significant negative effect on environmental pollution in the Sub-urban District of Mushin Local Government Area of Lagos State. Similarly, Water pollution with a coefficient of -0.690 and a p-value of 0.032 has a significant negative impact on the environment in the Sub-urban District of Mushin Local Government Area of Lagos State. Furthermore, land pollution with a coefficient of -1.067 and a p-value of 0.000 has a statistically significant negative impact on the environment in the Sub-urban District of Mushin Local Government Area of Lagos State.

On the other hand, it is noted that, people of Mushin have been suffering due to industries that expose their environs to the danger of pollution of various types in varying magnitude and this would have great impacts on the livelihood of the residents of the area in terms of the food consumed, air inhaled among others. The land, water and air have been degraded and in effect human health has been impaired and the fragile ecosystem has been exposed to more danger. Lastly, the lives of the residents are exposed to more risk health wise as there were few health facilities like hospitals, clinics, dispensaries and maternity centers amidst various forms of pollution in Mushin.

This indicates that the higher the pollution around the area the lower the quality of the environment. This is consistent with the findings of Evelyn and Tyav, (2012), who examined the

issue of environmental pollution and its attendant consequences on the Nigerian society. The findings show that environmental problems in Nigeria generally are many, diverse in nature, and are caused by man's interaction with nature (environment) for exploits in a number of ways-both in the cities; where industrial activities predominate, and rural areas; where agriculture thrives. The study found that air pollution significantly affects environment and health. Result from the in-depth interview shows that majority of the respondents interviewed believed that ill-health and contagious diseases are the major effect of environmental pollution.

Based on the interview conducted with respondents on the effect of environmental pollution in the study area:

Oluwasheyi (from Olateju ward) believes that air and land pollution is the major environmental pollution in this community. among the effect of these pollution is frequent illness especially among the children and elderly person of the community. If you visit the hospital you will understand. Among the commonest sickness in the community include diarrhea, asthma, cough, fever/malaria, etc.

The study of Obafemi, et al (2012) on Public Perception of Environmental Pollution in Warri, Nigeria, the analysis of the study reveals that 19.7% of total respondents agreed that water pollution leads to cough, 26.4% agreed on loss of aquatic lives, 14.5% agreed on the reduction of potable water while 18.4% agreed on typhoid. However, 3.9% and 1.3% believed that the effects of water pollution lead to diarrhea and skin infection respectively. In this study, 44.7% of the total respondents agreed that air pollution causes cough while about 35.5% agreed to cancer. 10.5% and 9.3% of total respondents agreed that air pollution leads to asthma. More so, the analysis also reveals that land pollution affects the growth of plants by causing stunted growth in plants and most often in crops. This is attested to as 96.1% of total respondents agreed that land pollution causes stunted growth in plants while only 3.9% believed that it causes corrosion in metals. Generally, it is believed that air catarrh respectively. The analysis therefore reveals that

pollution especially water and air pollution lead to various forms of diseases. Emissions from oil refineries contribute to noxious pollution, which has detrimental and adverse health effects on the surrounding community, inflicting environmental racism and environmental inequity upon the people of Contra Costa County (Pinderhughes, 2004). According to Aremu et al (2002), the levels of Lead, Cadmium, Manganese and Chromium exceeded the threshold limits (0.01, 0.003, 0.4 and 0.05 mg/l respectively) set by the WHO health-based guideline for drinking water in Warri due to effluents released by the refinery and this could portend environmental hazards.

This study is also supported with the analysis by Nduka and Orisakwe (2009) whereby the Manganese levels of potable water supply increased in Ekpan due to the effluents from the Warri refinery. This suggests that the increase in the concentration of these metals can cause danger to human health in the affected areas. Lead exposure has been associated with microcytic, hypochromic anemia with basophilic stippling of erythrocytes (Emory et al, 1999). Hyperactivity, anorexia, decreased play activity; low intelligence quotient and poor school performance have been observed in children with high lead levels (Needleman and Bellinger, 1991). Cadmium is highly toxic, accumulating in the body and eventually causing effects such as tubular dysfunction, disturbances, in calcium homeostatis and metabolism (World Resources Institute (WRI), 1992). It is capable of inducing renal, hepatic and testicular injury (Suzuki et al, 1989). Most Chromium (vi) compounds are carcinogenic, long exposure may cause kidney, liver and nerve tissue damage (Praydot, 1999). Bhutan Ministry of Social Services (MoSS) (1990) and Bhutan Ministry of Health and Education (MoHE) (1998) both in England affirmed that air pollution resulted to some diseases like cough and colds, bronchitis and asthma in Bhutan and these diseases were noted to have increased from 16% to 22.4% and 1.95% to 2.95% between 1990 and 1998.

4.4 Benefits Derived by the Inhabitant in Managing Environmental Pollution

Figure 4.1 shows the benefits derived by the people in managing environmental pollution. Result shows that majority of the respondents believed that having a cleaner environment is one of the benefits derived by the people of the study area in managing environmental pollution. Lesser visits to the hospital and fewer spending on drugs are also among the benefits derived by the people in managing environmental pollution.

Table 4.4 Benefits Derived by the inhabitant in Managing Environmental Pollution

Statement	Frequency	Percentage of Total
Clean environment	241	67%
Fewer visit to the health center	172	48%
Lesser spending on drugs	205	57%
Lesser contamination	83	23%
Serene environment	68	19%
Cleaner water for drinking and for aquatic live	44	12%

Results in table 4.4 revealed that few respondents believed that less contamination, serene environment and cleaner water for drinking and aquatic live are one of the benefits derived by the people managing environmental pollution among the people of study area. The findings show that majority of the respondents believed that having a cleaner environment is one of the benefits derived by the people in managing environmental pollution among the people of study area. Fewer visits to the hospital and lesser spending on drugs are also among the benefits derived by the people in managing environmental pollution. However, only little respondents believed that less contamination, serene environment and cleaner water for drinking and aquatic live are one of the benefits derived by the people managing environmental pollution among the people of study area.

The interview conducted with respondents on the effect of environmental pollution in the study area: Fumilayo (from Idi-Araba ward) explained:

That if there is proper control of environmental pollution in this community, frequent sickness will reduce and thereby reduce the excessive of money on medical care. Health is wealth, you know. According Hassana (from Idi-Araba ward), if the environment is manage properly, the environment will be conducive for living. Because it improve the health of an individual even the most vulnerable will experience changes in their health. There will be fewer cases of sickness in the community. according one of the nurse interviewed, stated that, air quality red reduced the risk of childhood asthma,improved lung growth and development in children also leads to lower risk for chronic lung disease in adulthood. She concluded, that alone is an important reason every family should make that their children live a serene environment and the community need to work together to ensure cleaner environment which will give us cleaner air or air quality for our health.

The result of this findings correspond with the United States, concerns about for air pollution which led to the Clean Air Act of 1970 and its amendments. The Clean Air Act, as it is now called, after further amendments in 1977 and 1990, has been heralded as one of the most effective public health policies of all time in the United States (Lee, et al, 2015). Emissions of the major pollutants (particulate matter [PM], sulfur oxides, nitrogen oxides, carbon monoxide, volatile organic compounds, and lead) were reduced by 73% between 1990 and 2015 while the U.S. gross domestic product grew by more than 250% (Ryan, et al, 2013).

The U.S. Environmental Protection Agency (EPA) determined that the monetized health benefits of the Clean Air Act exceeded the implementation costs by a factor of 32:1 (U.S. Environment Protection Agency, 2020). These benefits, valued at \$2.0 trillion in 2020, are primarily attributable to lower mortality, an estimated 230,000 attributable deaths avoided per year, due to lower concentrations of outdoor PM. Other benefits include reductions in premature mortality due to lower ozone concentrations (7,100 deaths avoided per year), reductions in acute myocardial infarction (200,000 fewer cases per year), avoided hospital admissions for respiratory

conditions (66,000 fewer admissions per year), and reductions in asthma exacerbations (2.4 million fewer attacks per year) (U.S. Environment Protection Agency, 2020).

Improved air quality has been linked to improvements in other health measures, including child lung growth and development. In Southern California, air quality control policies have resulted in steady improvements in air quality from the mid-1990s to the 2000s. The Children's Health Study evaluated yearly lung function during these two decades among more than 2,000 Southern California teenagers. The average rate of lung function growth was faster in children with and without asthma who lived in areas with a greater decline in PM_{2.5} and nitrogen dioxide (NO₂) (Adar, 2015). The prevalence of clinically defined low lung function declined from 7.9% in the mid-1990s to 3.6% in 2007–2011 as air quality improved. Reductions in PM_{2.5} and NO₂ between 1993 and 2014 reduced the risk of childhood asthma. A median reduction in NO₂ of 4.3 parts per billion (ppb) reduced the risk of incident asthma by 20% (Romieu, et al, 2015). Improved lung growth and development in children also leads to lower risk for chronic lung disease in adulthood (Smith et al, 2011).

National and European Union air quality regulations have also resulted in dramatic improvements in air quality in Western Europe. In Dublin, for example, black smoke concentrations declined up to 70% after a ban on coal sales in 1990. Subsequently, annual respiratory deaths decreased by 17%, whereas nontrauma death rates and cardiovascular death rates did not decrease compared with control groups (Sood et al, 2018).

4.2.5 Practical steps taken by government and relevant stakeholder in controlling environmental pollution

This section presents the Practical steps to be taken by government and relevant organizations to ensure possible solutions and means of controlling the phenomenon of environmental pollution in the study area.

Table 4.2.5: Practical steps taken by government and relevant stakeholder in controlling the phenomenon of environmental pollution.

S/N		Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
1	Government should enact laws punishing offences relating to environmental pollution	107 (30%)	161 (45%)	50 (14%)	29 (8%)	11 (3%)	358 (100%)
2	Campaigns and workshop to enhance safe environmental practices should be embarked upon by government and relevant agencies to inculcate knowledge into individuals	57 (16%)	251 (70%)	29 (8%)	17 (5%)	4 (1%)	358 (100%)
3	NGOs and other agencies independent of the government should be actively involved in the enacting of laws regarding environmental degradation	57 (16%)	136 (38%)	94 (26%)	39 (11%)	32 (9%)	358 (100%)
4	Government should make available reward packages for individuals who adhere to environmental laws so as to encourage active participation	82 (23%)	100 (28%)	58 (16%)	75 (21%)	43 (12%)	358 (100%)
5	Existing sanitation laws should be revisited and made more active to ensure holistic participation	132 (37%)	154 (43%)	4 (1%)	47 (13%)	21 (6%)	358 (100%)

Some of the practical steps taken by government and relevant stakeholder to ensure possible solutions and means of controlling the phenomenon of environmental pollution is presented in Table 4.5, result shows that Majority (45%) of the respondents agreed that Government should enact laws punishing offences relating to environmental pollution, 30% of the respondents strongly agree, 14% are undecided, 7% disagree while only 3% of the total respondents strongly disagreed.

Similarly, majority of the respondents (70%) agreed that to ensure possible means of controlling the phenomenon of environmental pollution, campaigns and workshop to enhance safe environmental practices should be embarked upon by government and relevant agencies to inculcate knowledge into individuals. 16% of the total respondents strongly agree, 8% were undecided, 5% disagree while only 1% of the respondents strongly disagree.

Furthermore, NGOs and other agencies independent of the government should be actively involved in the enacting of laws regarding environmental degradation is agreed by 38% of the total respondents to ensure possible means of controlling the phenomenon of environmental pollution. 16% strongly agreed, 26% are undecided, 12% disagreed while only 9% of the total respondents strongly disagreed with the statement.

There are mixed feeling among the respondents on if government should make available reward packages for individuals who adhere to environmental laws so as to encourage active participation. 23% of the total respondents strongly agreed, 28% agreed, 16% undecided, 20% disagreed and 12% of the total respondents strongly disagreed that government should make available reward packages for individuals who adhere to environmental laws so as to encourage active participation.

In addition, as a way to ensure possible solution and means of controlling the environmental pollution, majority of the respondents are of the opinion that existing sanitation laws should be revisited and made more active to ensure holistic participation as 37% of the total respondents strongly agreed and another 43% of the respondents agreed to the statement. Only 1% of the respondents were undecided on the issue while 13% disagree and another 6% strongly disagreed with the statement.

This indicates that with an enabling law in place, many people will take it as a duty to ensure a pollution free environment. Furthermore, respondents interviewed opined that the current waste disposal system put in place by the Lagos State Government has failed and has done more harm than good, they complained that the waste management company do not come on time to dispose of their waste thereby making the area stinks most time, most of them however said they have look for alternative means by digging a hole where they dump their refuse while some said they burn the refuse.

Result from the interview conducted with respondents on the effect of environmental pollution in the study area: During the interview, Jimoh (from Papa Ajao ward) maintained that:

Enactment of environmental policy by the government is sufficient to control and manage environmental pollution which has burden a culture and burden to humanity. However, government should make sure that offenders of environmental laws are punishment without favour. Individual should utilize their knowledge of environmental sanitation to keep it clean for human survival sake. According to Nka (from Alakara ward) stated that government should work with NGOs in enlighten the general public not only on the benefits of controlling environmental but on the health effects of environmental pollution because human being fear negative ((death) than positive.

In contrary to these findings is the opinions of scholars on the ways of preventing environmental pollution. Thiel et al. (2015) stated that with increasing human population, pollution has become a great concern. Environmental pollution from human activities is a problem that does not have to be inevitable. With a comprehensive environmental pollution prevention program, most pollution can be reduced, reused, or prevented. Reducing and managing pollution may decrease its health impacts.

Environmental pollution prevention however is a key issue to sustainability. Environmental pollution results from waste. The best way to deal with environmental pollution is to prevent it from being created in the first place. This means finding new efficiencies, doing things smarter,

and valuing every resource. Understanding how waste is produced and how it can be minimized, or even prevented, is the first step to reduce waste and protect our environment; in that way, pollution prevention is an essential component of sustainability(Thiel et al. (2015).

Fundamental ideas of preventing environmental pollution rather than fixing problems are essential for efficient, economically viable manufacturing, providing services, and addressing many environmental problems (Jorgenson and Wilcoxon 1990).

Prevention is the first priority within an environmental management hierarchy that includes prevention, recycling, treatment, and disposal or release. Pollution prevention, however, requires a cultural change, one which encourages more anticipation and internalizing of real environmental costs by those who may generate pollution (United States Environmental Protection Agency n.d.).Our responsibility is to utilize our knowledge to take actions that are protective of human health and the environment.

Environmental pollution prevention reduces the amount of pollution generated by a process (industry, agriculture, or consumers). Environmental pollution-control strategies, in general, seek to manage a pollutant after it is emitted and reduce its impact upon the environment; the pollution prevention approach, however, seeks to increase the efficiency of a process (Sherman et al. 2016), hence reducing the amount of pollution generated at its source. Although there is wide agreement that source reduction is the preferred strategy, some professionals also use the term pollution prevention to include pollution reduction.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

In this chapter, summary, conclusion and recommendations are presented. The conclusions emanating from the findings and also subsequent recommendations arising from the study are also discussed.

5.2 Summary of the study

This study investigated public perception on the effects of environmental pollution in the Sub-urban district of study area, in order to examine the various causes of environmental pollution in the Sub-urban district of the study area, to find out how people perceive the effects of environmental pollution in the study area. Others are to find out practical steps taken by government and relevant stakeholder in controlling environmental pollution in the study area and to determine the benefits derived by the people in managing environmental pollution among the people of study area.

The study was specifically targeted to find out public perception on the effects of environmental pollution; the study employed a surveyresearch design. The population of the study comprises of inhabitant of Alakara, Idi-oro/Odi-olowo, Babalosa, Ojuwoye, Ilupeju, Olateju, Kayode/Fadeyi andIlupeju/Industrial, others areMushin/Atewolara, Papa Ajao, Ilasamaja, Babalosa/Idi-Araba, Itire and Idi-Araba in the study area. The sample comprised a total of 383 respondentsdrawn from all the Federal Constituencies of Mushin Local Government Area and their wards were strategically used to collect sampling technique.

Two instruments were used in collecting data for this study; they are Effect of Environmental Pollution Questionnaire (EEPQ) and a structured interview guide. The two instruments were pilot tested in a different environment outside the study area using split half method. Both were administered to the respondents by researcher with the help of research assistant who are resident in the area. In collecting the data, the researcher visited all the wards so as to administer the questionnaire to the respondents. The four research questions were analyzed using descriptive and inferential statistics using Microsoft excel and SPSS version 24, simple percentage and regression coefficient statistics tested at 0.05 level of significance.

5.3 Conclusions

This study investigated public perception on the effects of environmental pollution in the Sub-urban district of the study area from the findings of this research the following conclusions were made;

In view of the findings obtained from this study, it was concluded that bad odour arising from open dump site, blocked drainages and canals, smokes from automobile engines, discharge of gases into the air like smokes from industries and deforestation are some of the major causes of environmental pollution in the Sub-urban District of the study area.

All the three forms of pollution which are air pollution, water pollution and land pollution have significant negative effects on the environment in the Sub-urban District of the study area. This indicates that, the more land, air and water around the area is being polluted, the lesser the quality of the environment obtainable in the area. Pollution on air, water and land significantly affects the quality of the environment in the Sub-urban District of the study area.

Furthermore, among the benefits derived by the people in managing environmental pollution in the Sub-urban District of the study area. State are cleaner environment, fewer visits to the hospital and lesser spending on drugs.

In a bid to ensure possible solutions and means of controlling the phenomenon of environmental pollution government should enact laws punishing offences relating to environmental pollution, campaigns and workshop to enhance safe environmental practices should be embarked upon by government and relevant agencies to inculcate knowledge into individuals. NGOs and other agencies independent of the government should be actively involved in the enacting of laws regarding environmental pollution in the Sub-urban District of the study area.

5.4 Recommendations.

The following recommendations were made and among which include the followings;

- Government should embark on a program that will sensitize the residents on the causes of pollution from land, water and air, proper waste disposals, and what can be done to reduce or eliminate the pollution in order to ensure good quality environment.
- The residents need to be educated on the benefits derived by the people in managing environmental pollution. The graphical and monetary benefits of ensuring a cleaner environment should be shown to the residents for them to appreciate the need for the management of environmental pollution.
- Government should provide enabling laws to ensure that pollution in the environment is reduced. This can be done by introducing the monthly sanitation exercise and revitalizing the Saturday's monthly sanitation exercise in market places.

- The government and relevant stakeholder should Organize seminars, workshop, conference involving environmental and health workers in the study area so that residents would be updated on how to maintain a pollution free to ensure good quality environment.

5.5 Contribution to Knowledge

The contributions to knowledge of this study were as follows;

- This study provides residents of Sub-urban District of Mushin Local Government Area of Lagos State on the major causes of environmental pollution in the area.
- This study also reaffirms that air pollution, water pollution and land pollution have significantly effect on the environment.
- This study also provides readers or researchers who may wish to conduct research on environmental pollution with the literature to be reviewed.

5.6 Suggestions for Further Study

- The result obtained in this study was for environmental pollution and can therefore be tried for other environmental or health related problems.
- Researchers may use the findings of this study to guide them conduct further research on other environmental pollution causes.
- Further work may also be preferred on more demanding scientific approach to measuring air quality using a gadget.
- That similar study should be conducted elsewhere to see whether it will yield similar or different result with the present study.

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APPENDIX A

Frequencies

Statistics

		gender	Age	Education	status	Occupation
N	Valid	358	358	358	358	358
	Missing	0	0	0	0	0

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	228	63.7	63.7	63.7
	Female	130	36.3	36.3	100.0
	Total	358	100.0	100.0	

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15 - 20years	30	8.4	8.4	8.4
	21 - 30years	170	47.5	47.5	55.9
	31 - 40years	130	36.3	36.3	92.2
	Above 40years	28	7.8	7.8	100.0
	Total	358	100.0	100.0	

Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No Education	2	.6	.6	.6
	Primary Education	3	.8	.8	1.4
	Secondary Education	47	13.1	13.1	14.5
	OND/HND	181	50.6	50.6	65.1
	Graduate qualification	122	34.1	34.1	99.2
	Postgraduate	3	.8	.8	100.0
	Total	358	100.0	100.0	

Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	86	24.0	24.0	24.0
	Married	188	52.5	52.5	76.5
	Widowed	82	22.9	22.9	99.4
	Divorced	2	.6	.6	100.0
	Total	358	100.0	100.0	

Occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Civil servant	81	22.6	22.6	22.6
	Private/factory worker	123	34.4	34.4	57.0
	Trader/ business owner	97	27.1	27.1	84.1

Apprentice	33	9.2	9.2	93.3
Student	22	6.1	6.1	99.4
No work at all	2	.6	.6	100.0
Total	358	100.0	100.0	

FREQUENCIES VARIABLES=causes1 causes2 causes3 causes4 causes5 causes6 Causes7 causes8 causes9
/ORDER=ANALYSIS.

Frequencies

Notes

Output Created	18-SEP-2019 14:21:10	
Comments		
Input	Data	C:\Users\sulbell\Documents\Polluti on.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	358
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data.
Syntax	FREQUENCIES VARIABLES=causes1 causes2 causes3 causes4 causes5 causes6 Causes7 causes8 causes9 /ORDER=ANALYSIS.	

Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.09

Statistics

		causes1	causes2	causes3	causes4	causes5	causes6	Causes7	causes8
N	Valid	358	358	358	358	358	358	358	358
	Missing	0	0	0	0	0	0	0	0

Frequency Table

causes1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	44	12.3	12.3	12.3
	No	314	87.7	87.7	100.0
	Total	358	100.0	100.0	

causes2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	351	98.0	98.0	98.0
	No	7	2.0	2.0	100.0
	Total	358	100.0	100.0	

causes3

		Frequency	Percent	Valid Percent	Cumulative Percent
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Valid	Yes	358	100.0	100.0	100.0
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causes4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	358	100.0	100.0	100.0

causes5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	.3	.3	.3
	Undecided	6	1.7	1.7	2.0
	Agree	26	7.3	7.3	9.2
	Strongly Agree	325	90.8	90.8	100.0
	Total	358	100.0	100.0	

causes6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	.6	.6	.6
	Disagree	1	.3	.3	.8
	Undecided	4	1.1	1.1	2.0
	Agree	158	44.1	44.1	46.1
	Strongly Agree	193	53.9	53.9	100.0
	Total	358	100.0	100.0	

Causes7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	.6	.6	.6
	Disagree	8	2.2	2.2	2.8
	Undecided	22	6.1	6.1	8.9
	Agree	173	48.3	48.3	57.3
	Strongly Agree	153	42.7	42.7	100.0
	Total	358	100.0	100.0	

causes8

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.3	.3	.3
	Disagree	9	2.5	2.5	2.8
	Undecided	14	3.9	3.9	6.7
	Agree	199	55.6	55.6	62.3
	Strongly Agree	135	37.7	37.7	100.0
	Total	358	100.0	100.0	

causes9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	2	.6	.6	.6
	Undecided	13	3.6	3.6	4.2
	Agree	216	60.3	60.3	64.5

Strongly Agree	127	35.5	35.5	100.0
Total	358	100.0	100.0	

Regression

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Land, Air, Water ^b	.	Enter

a. Dependent Variable: Environmental pollution

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.423 ^a	.179	.172	.68090

a. Predictors: (Constant), Land, Air, Water

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.027	3	11.342	24.464	.000 ^b
	Residual	156.243	337	.464		
	Total	190.270	340			

a. Dependent Variable: Environmental pollution

b. Predictors: (Constant), Land, Air, Water

Coefficients^a

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients Beta		
1	(Constant)	-7.341	1.639		-4.479	.000
	Air	.691	.264	.142	2.620	.009
	Water	.690	.320	.118	2.157	.032
	Land	1.067	.207	.284	5.148	.000

a. Dependent Variable: Environmental pollution

DATASET ACTIVATE DataSet1.

FREQUENCIES VARIABLES=AP1 AP2 AP3 AP4 LP1 LP2 LP3 LP4 WP1 WP2 WP3 WP4

/ORDER=ANALYSIS.

APPENDIX B

Questionnaires

Bayero University, Kano
Faculty of Earth and Environmental Sciences,
Department of Environmental Management.
29/07/2019

To whom it may concern

Dear Respondents

I am a postgraduate student of the above mentioned institution carrying out a research on Public Perception on the Effects of Environmental Pollution in the Sub-urban District of Mushin LGA of Lagos State.

I would appreciate your cooperation in answering the attached questionnaire to enable me obtain relevant and accurate information for my study.

Demographic Information of Respondents

1. Gender: Male [] Female []
2. Age: 15-20 years [] 21-30 []
 31-40 [] 41-above []
3. Marital Status:
 Single [] Married [] widow [] Divorced []
4. Educational Level:
No education [] Primary education [] Secondary education []
OND/NCE [] Graduate qualification [] Post graduate []
5. **Occupation**

Civil servant [] Private/factory worker [] Trader/ business owner []
 Apprentice [] Student [] No work at all []

6. Place of Residence: _____

**PUBLIC PERCEPTIONS ON THE EFFECTS OF ENVIRONMENTAL POLLUTION
 ON THE ENVIRONMENT UNDER STUDY I.E. MUSHIN LOCAL GOVERNMENT
 AREA OF LAGOS STATE**

In what ways do various activities affect and influence environmental pollution.

**SA: Strongly Agree A: Agree UD: Undecided D: Disagree SD: Strongly
 Disagree**

S/N	ITEMS	SA	A	UD	D	SD
	AIR POLLUTION					
a.	Smoke from automobiles like cars and machines exhaust can cause air pollution.					
b.	Global warming activities causes air pollution					
c.	Industrial discharge like gas discharges from industries can pollute the air					
d.	Cooking activities that produce smokes like cooking with firewood or smoke causes air pollution					
	LAND POLLUTION					
a.	The use of chemicals in farming can pollute the land					
b.	Waste disposal like refuse wastes can pollute the land					
c.	Waste from animals like animal dungs and urine can cause land pollution					
d.	Mining activities like cement companies exploring limestone can contribute to land pollution					
	WATER POLLUTION					
a.	waste disposal like solid waste into water causes water pollution					
b.	Sanitary channels from bathrooms and toilets can also cause water pollution					
c.	The use of chemicals in fishing can cause water pollution					
d.	Industrial wastes from industries when channeled into water reduces water quality and pollutes water					

CAUSES OF ENVIRONMENTAL POLLUTION

S/N	Variables	<i>Strongly Agree</i>	<i>Agree</i>	<i>Undecided</i>	<i>Disagree</i>	<i>Strongly Disagree</i>
1	Bad odour arising from open dump site					
2	blocked drainages and canals					
3	Smokes from automobile engines					
4	Discharge of gasses into the air like smokes from industries					
5	Transportation which involves excessive movement of vehicles					
6	Animal farming and improper disposal of animal wastes can go a long way in reducing air quality					
7	Excessive noise					
8	Population growth which involves congestion of people and houses					
9	Deforestation activities involving the felling of trees.					

BENEFITS DERIVED BY THE INHABITANT IN MANAGING ENVIRONMENTAL POLLUTION

Multiple question (You can choose more than one)

- a. Less visit to health centres []
- b. Less spending on drugs []
- c. Less contamination []
- d. Serene environment []
- e. Cleaner water for drinking and aquatic life []

WHAT PRACTICAL STEPS TAKEN BY GOVERNMENT AND RELEVANT STAKEHOLDERS IN CONTROLLING ENVIRONMENTAL POLLUTION.

SA: Strongly Agree A: Agree UD: Undecided D: Disagree SD: Strongly Disagree

WHAT PRACTICAL STEPS SHOULD BE TAKEN BY GOVERNMENT AND RELEVANT STAKEHOLDERS IN CONTROLLING ENVIRONMENTAL POLLUTION?						
S/N	ITEMS	SA	A	UD	D	SD
30.	Government should enact laws punishing offences relating to environmental pollution					
31.	Campaigns and workshop to enhance safe environmental practices should be embarked upon by government and relevant agencies to inculcate knowledge into individuals					
32.	NGOs and other agencies independent of the government should be actively involved in the enacting of laws regarding environmental degradation					
33.	Government should make available reward packages for individuals who adhere to environmental laws so as to encourage active participation					
34.	Existing sanitation laws should be revisited and made more active to ensure holistic participation					

APPENDIX C
STRUCTURED INTERVIEW

Good day sir/ma,

I am a postgraduate student of Bayero University, Kano, Faculty of Earth and Environmental Sciences carrying out a research on the topic: “Effects of Environmental Pollution on Air Quality in the Sub-urban District of Mushin LGA of Lagos State”.

I would appreciate your cooperation sir/ma in answering the under listed questions to enable me obtain accurate and necessary information for my study. Your response will be treated with utmost confidence and will be used for academic purposes only.

Thanks for your cooperation.

1. Are you resident in Mushin LGA?
2. Are you aware of environmental pollution challenges in your area?
3. What are the various causes of air degradations in your area?
4. What are the effects of environmental pollution on the environment?
5. Do you know if there is any environmental pollution management facility in the area?
6. What are the steps taken so far by the government in the management of environmental pollution on air among the people in your area?
7. What are the possible means of controlling the phenomenon of environmental pollution in your area?