Chapter One

Introduction

1.1 Background to the Study

Waste management remains an important issue as a result of environmental sustainability and human health implications it possesses to the world at large. It remains one of the challenges confronting the world today due to the fact that this is faced with the challenge of open refuse disposal[1]. To ascertain this claim, waste management remains a global challenging threats to the world and the developing countries remain the most hit countries which is due to their adverse environmental effects[2]. Ordinarily, mankind is believed to be reliant on his environment so as to survive however, solid waste remains one of major environmental strands that confront the Nigerian state, also the so called developed world are not totally free from this challenges as well. It plays a major role in nature ability to comfort life within it capacities.

Management of solid waste in urban areas of the developing world is undertaking a major environmental and social challenges. Particularly in the Sub-Sahara Africa region, the influence of high rate of urbanization as well as high population growth, and most importantly poverty makes the situation worsen. The significance of this contention or problem can be seen with the attention given to waste management by the United Nation Millennium Declaration of September 2000. Out of the eight Development Goals, three declarations strongly lay emphasis on resource or waste efficiency implications.

Firstly, to ascertain environmental sustainability through the means of integrating the core principles of development sustainability into every country's programmes and polices thereby reversing the loss of resources.

Eliminating or getting rid of hunger and extreme poverty by halving between 1991 and 2016, the percent of persons that their income is not more than one dollar in a day.

By developing a global partnership for economic development which will address the cogent needs of less developed or developing countries, small island as well as countries that are landlocked. As a response to challenges of waste, several developed states have taken good environmental reforms which has made them record a high rate of success in the management of their solid waste. Thus, developing countries like Nigeria, have not been able to record such success like the developed world. This is due to the fact that there are several problems which municipal solid waste management is being confronted with in the country. In buttressing this point, the African Development Bank carried out four countries study on solid waste management. The followings were their findings:

i. Countries in African do not have a serious legislation on waste management yet.
ii. In vast majority of African countries, waste management is often characterized by an inefficient and ineffective method of collection, improper disposition of waste as well as limited coverage of waste management area.
iii. Characterization of waste data in the urban areas of these African countries are not available generally.
iv. Lastly, waste regulatory initiatives which will minimize as well as manage waste are not available.

In many ways Nigeria is typically a developing country with a high rate of waste management difficulties and problems. It has a large population of over 200 million people. Population growth rate is well above global average at 2.9% per annum. Rapid urbanization and an unevenly

distributed wealth occasioned by huge oil income are other factors influencing waste growth in the country.

Domestic waste management, collection and disposal have always been a universal issue. This is because efficient and appropriate collection and disposal of solid waste has been recognized as essential to the hygiene and health of urban societies-since the nineteenth century. Over the course of the first half of the twentieth century, sanitary engineers and the broader public also came to understand that the inappropriate treatment of waste could cause major environmental degradation, while recycling could contribute significantly to environmental sustainability. Waste management is imperative because improperly stored refuse can cause health, safety and economic problems. All living organisms create waste, but humans create far more waste than other species. To prevent damaging the Earth's ecosystems and maintain a high quality of life for the planet's inhabitants, humans must manage and store their waste efficiently and safely. In addition, the problem of municipal waste has also turned into a global challenge because of an exponentially increased population, rapid urbanization, and worldwide industrialization and limited resources[3]. Also, developing countries are facing some typical problems when municipal solid waste management(MSWM) is discussed, which envisage poor and inefficient coverage and operation of services, inadequate or missing recycling strategies and activities, limited or unproductive management of hazardous waste etc[4]. The major problem caused by wastes to the environment is pollution characterized by various types of solid wastes which include paper, textile plastic, metals, glass, bone, wood, vegetal matter and food remnant of multiple consistency. According to studies, it was noted that for years, the major problem in Israel was the accumulation of tens of thousands of tons of organic wastes. Also, in the U.S until the 1970's, Federal Agencies had little authority to regulate hazardous and solid disposal in an unsafe

manner at landfills or in inclined lagoons, with some wastes simply dumped on the ground or in surface waters. Today, solid waste management becomes a complex and multidisciplinary problem, needed to be approached from technical, economic, social points of view in order to ensure its sustainability, since the concept of environmental sustainability is a key criterion to design waste management systems[5].

There are three components of sustainable development: economic development, social development and environmental protection. Sustainable development ensures a developed world with secured and healthy environment for all; human beings, animals and plants. Since the primary function of solid waste management is to ensure public health protection together with environmental quality and sustainable development, national and local authorities must adopt sustainable solid waste management systems in a tight partnership with both the public and private sector[6]. Since poor waste disposal habit of the people, corruption, weak government regulation, poor work attitude, insufficient fund, inadequate facilities such as plants and equipment among others are factors militating against effective waste management towards sustainable development in Nigeria as a whole. Therefore, if there is to be sustainable development in waste management in Nigeria, the availability of land (for landfill), human resources, adequate funds, plant and equipment and other tools must be readily available. We need to protect future for the next generation by cleaning up our environment of all types of waste, taking into consideration both physical and population development of the state. Generally, waste management is defined as the collection, keeping, treatment, disposal and recycling of wastes in such a way as to render it harmless to human and animal life, the ecology in particular and the environment in general. Despite this laudable attention, collection, disposal, processing, treatment, recycling and utilization have defied solution. At present, private sector

waste disposal operators diligently visit homes and carry away refuse bags, load them into waiting trucks and cart them away for final disposal. Recognizing waste management agency as well as the importance of waste management as an instrument of achieving sustainable development in Oyo State, government has intensified efforts to create wealth and job opportunities for the teeming unemployed youths in the state, a sizeable portion of land has been acquired in different areas of the state by the state government to establish a recycling plant. It is under the auspices of the foregoing that the study sets out to ascertain the administration of waste management agency in Nigeria citing Oyo's State waste management authority as a study

1.2 Statement of the Problem

Improper handling of waste management poses a serious threat in the public and environment health sector. The general practice of management of waste in Nigeria involves collecting of waste materials and subsequently dumping the waste at a designated dumpsite. Development is highly needed to boast the standard living of people in the country. Thus, it is important to know that developmental project has an impact on ecology, environment, and the most of others. Over the past years, people have been talking waste management agencies and the role they play in actualizing sustainable development. Sustainable development therefore has three main components which are: environment protection, social development and economic development.

Similarly, there are lots of other factors which contributes to environmental degradation, a good example is the quality of industrial waste and household waste. This is where the duties of waste management agency are being questioned. Helping to attain sustainable development by waste management agency requires meeting the needs of people as well as extending opportunities to people so as to satisfy people's aspiration for better life. Over the past years, administration of

waste management agency has attracted a lot of attention from governments, researchers, international environmental bodies, and different countries alike. The reason for this is simple, there is an increase rate or geometric progression in environmental degradation as well as environmental pollution. Corruption, weak governmental policies and regulations, poor and unhygienic disposal of waste by people, inadequate waste management facilities etc. Thus, if a serene environment is to be achieved by the administration of waste management in Nigeria, the forgone above factors which the agency lacks must be quickly addressed for the efficiency and efficacy of the agency.

1.3 Aim and Objectives of the Study

The aim of this study tends to examine the administration of waste management in Nigeria, a study of Oyo State Waste Management Authority (OYOWMA).

The study's specific objectives of the research are to:

i. explore the factors affecting the efficacy and efficiency of waste management administration in Nigeria.
ii. elucidate the effects improper waste management poses on Oyo state.
iii. evaluate the strategies for waste utilization and reductions in Oyo State.

1.4 Research Questions

The research work comes up with the following research questions.

1. What are the factors affecting the efficacy and efficiency of administration of waste management in Oyo State (OYOWMA)?
2. What effects do improper waste management poses on Oyo State?
3. What are the best strategies for waste management utilisation and reduction in Oyo State?

1.5 Significance of the Study

The government, waste agencies as well as the general public all tends to be a beneficiary of this research work. The outcome of the research work will empirically enhance the government and the general public to understand how reckless and hazardous disposal of solid waste in every corner of the Oyo state and he entire country at large hamper or impede a serene environment in Oyo State. Similarly, this research work will help to enhance government unwillingness to make funds available for evacuation of solid waste and undelaying in payment of salaries of sister agencies who are responsible for management of waste agencies in the state. Lastly, theoretically this research work will make significant contribution in management field as it will serves as a body of knowledge in management of solid waste in Nigeria.

1.6 Scope of the Study

This research work focuses on the administration of waste management in Nigeria particularly laying emphasis on Oyo State Waste Management.

1.7 Limitation of the Study

During the course of this study, there were several challenges and limitations that were met, it is important to know that some of these limitations were expected whereas the rest weren't expected. The researcher had difficulty to access data on administration of waste management as relevant parastatal were reluctant to provide this information.

1.8 Operational Definition of Terms

Waste Management: This simply refers to the strategy an organization uses to dispose, reuse, reduce and prevent waste. Possible waste disposal methods are recycling, composting, incineration, landfills, waste to energy etc

Waste(s): Waste(s) in this research work denote unwanted or unstable materials. It can also be defined as any substance which is discarded after primary use, or is worthless, defective and of no use. A by-product by contrast us a joint product of relatively minor economic value. A waste product may become a by-product or resource through invention that raises a waste product's value above zero.

Authority: In this research work, authority simply refers to the political legitimacy which grants and justifies the sovereign right to exercise the power of government. It identifies the ability to accomplish an authorized goal.

Municipal: Municipal in this research work denotes city, town or a specific locality.

Management: Management can be defined as a set activity at the efficient and effective utilization of resources in the pursuit of one or more goals. It can also be defined as working with human, financial and physical resources to achieve organizational objectives by performing the planning, organizing, leading and controlling functions.

Sustainable Development: Sustainable development is an organizing principle for meeting human development goals while also sustaining the ability of natural systems to provide the natural resources and ecosystem services on which the economy and society depend.

Endnotes

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Chapter Two

Literature Review

2.1 Conceptual Review

2.1.1 The Concept of Waste

Vast majority of waste are generated by mostly by human activities. However, the production of waste nonetheless continues to be a significant point of public concern, just as it consistently been from prehistoric times on. There has been a recent growth in both the rate as well as the amount of generation of waste. With the increase in the generation of wastes, there is also an expansion in waste diversity. In contrast to those prehistoric eras, in which waste was simply an irritant with a need to be disposed off[2]. At that time, there was no major problem with proper management, due to the fact there was a small amount of population available at that time along with the availability of a large portion of land. Back then, it was easy to absorb the amount of waste generated without causing any adverse effects to the environment.

However, waste was not a serious problem not until the 20th century, during the Industrial Revolution, when people began to move from the countryside to the cities. Such migration into cities resulted in an explosion of population, which in turn precipitated a sudden rise in the volume as well as the various waste compositions that were generated within the cities. It was at these times materials like glass and metals started to show up in the municipal waste streams in large quantities. High populations within cities as well as municipalities created waste indiscriminately lying around and resulting in open dumpsites[3]. These dump sites, on the other hand, constituted breeding sites for rodents as well as some other vermin and were significant hazards to the health of the public. As a result of the practices of unhealthy waste disposal, many

epidemics broke out, resulting in a significant death toll. Consequently, during the nineteenth century, officials-initiated waste management in a regulated setting to safeguard a healthy public environment.

The vast majority of industrialized societies underwent a transition of ecological development. Nevertheless, today virtually all of have come on top of issues of environmental public health as well as issues of pollution related to the waste generation process. On the contrary, growing industrialization as well as developing economies are replicating same environmental historical issues which developed nations had to deal with in the past[4].

A key Question in today's management of waste is: What precisely is waste? It is the unuseful byproduct of human endeavor containing materials which are physically identical to those found in the product which is useful. Also, waste is defined to mean any material or product which is of no use to the person who generates it. Point was made that waste is something humans are trying to discard, as well as a product of highly inefficient processes of production, whose constant generation constitutes a loss in essential resources. Therefore, a resource that one person regards as a trash could be a valuable asset for another person[5].

A waste is defined as garbage or those materials that are not used and economically unproductive unless subjected to further processing. This is where Nigel stresses that when something is considered waste, it is economically unusable - in other words, something is unproductive due to the fact the economic value(s) in it has been lost. What this means here is that since it has lost its value in economic terms, therefore, it is unproductive. These positions however are often questioned, due to the fact recent case practice has demonstrated how material that one party deems non-essential as well as economically useless may in fact be of the greatest significance as well as economic worth to someone else. Nevertheless, a different person could choose to scoop

it up to either reuse or recycle the abandoned bottle in order to pick up a different liquid substance or another item of economic importance. The crux of the argument is it is unclear at which point an item is deemed to be a waste[6].

Succinctly, it stated there is no conclusive definitional list of for what is waste or what is not. It further argues that the issue of when a material is discarded or not as waste - as well as the issue of deciding as to when waste ceases to be waste - is a question of case by case basis and thus of interpretation of the law. believes that the determination of when a substance is or is not disposed of or discarded as waste is up to the maker or holder of such a material, who may decide whether or not to discard it as waste, on the one hand, as well as to the statute or law mandating that it be so, on the other[7].

Categorizations include: record as to what is waste and not waste, agreed to a definition that a waste is all substances or objects falling within the following categories which the holder intends or is required to:

i. Residues of production or consumption that are not otherwise identified below.
ii. Products not specified
iii. Materials that have expired their use date
iv. Those materials which have been lost, spilled, or otherwise experienced a catastrophic mishap, which includes any type of materials, supplies, equipment, etc. which have become contaminated as a result of the mishap
v. All materials soiled or found to be contaminated resulting from intended actions (e.g., debris from any clean-up, packaging as well as containers, etc.
vi. Unwasteable items (e.g., batteries that have been rejected, used catalysts), etc.

vii. Unsatisfactory performance substances (e.g., polluted acids, solvents that are polluted, tempering salts that have been exhausted), etc.

viii. Reserves from commercial processes (e.g distillation bottoms and slags etc.).

ix. Waste residues from contaminant abatement (e.g., spent filters, bughouse dusts, scrubber sludges, etc.)

x. Waste residues from machining (e.g. mill scale, turnings, etc.)

xi. Waste residues from the extraction and processing of raw materials (e.g. oilfield sludges, mining residues, etc.)

xii. Materials adulterated (e.g. oils polluted with PCBs, etc.

xiii. Countries' materials, substances or produce prohibited by law from use

xiv. Those products no longer of use to the owner (e.g., wastes from household, stores, office as well as agricultural and commercial etc.)

xv. Materials, substances as well as products contaminated originating from land remediation activities.

xvi. Those materials, Substances or Products which are not contained among the categories mentioned above.

xvii. The holder in this context is the generator (anybody by whose activity any waste is created and/or everybody who pre-treats, mixes or otherwise conducts procedures that result in a change in the nature or composition of such waste) of waste or the natural or juridical entity in whose custody it is[8].

It is perhaps worth reiterating at this point that waste is a subjective concept at some times, since items that some people throw away can be of value to another, and because it is difficult to account for waste on a worldwide level, since countries vary in their definitions of waste and

what falls into waste categories, as well as in the ways in which they report it. In other words: What the Council of the Common European Communities defines as waste may be different from what is considered waste in Nigeria or in some other country.

Specifically, there are seven intrinsic aspects of waste. It includes waste as (a, an):

Waste: an omission to make use of something sagely, correctly, completely, or sensibly. For example: a complete waste of money.

Unwanted material: items which are undesirable or useless, remnants or secondary products, or household wastes. Example: chemical waste

Excrement: undigested food residue that the body excretes as waste.

Used or contaminated water: used or contaminated water from household, industrial, or mining sources. Rock associated with minerals: confining rock that has undergone mining associated with a single mineral, or ore whose aggregate mineral contents are inadequate to justify additional processing.

Wild area: a region that is unrefined, desolate, or savage (often used in the plural), like the frozen wastelands of Antarctica. Destroyed area: a location or area that has been devastated or devastated[9].

Under the Basel Convention, environmental waste has been adopted to the school of thought that regards waste as substances or objects that are disposed of, are intended to be disposed of or are required to be disposed of under national law[10]. In contrast, the United Nations Statistics

Division (UNSD) sees it as materials that are not primary products (i.e., products produced for the market) for which the producer has no continuing use for his or her own production, transforming, or consumer purposes and which he or she wishes to dispose of. Waste may be generated during the extraction of raw ingredients, the converting of raw ingredients into intermediate and final products, the consumption of final products, and other types of human activities. Waste that is recycled or reused at the point of generation is excluded. In the Nigerian context, it should be noted that the 1988 Federal Environmental Protection Agency Act does not conceptualize waste, thus, only some national laws attempt to do so. The Lagos State Environmental Sanitation Edict, for instance, contains a definition similar to the UK Environmental Protection Act of 1990, namely, any substance that is a waste material, sewage, or other excess undesirable quantity resulting from the use of a process the following:

i. its source,

ii. its harmful effect on humans and the environment, and

iii. The control which are appropriate to deal with it. With regards to the source classification, it either comes out of the shop (market) or office - commercial waste or, out of the factory- industrial waste, or out of the home – household or domestic waste[11].

There are four perspectives by which wastes could be interpreted. They are:

i. non-wanted things created, not intended, or not avoided, with no purpose.

ii. Things that were given a finite purpose thus destined to become useless after fulfilling it.

iii. things with well-defined purpose, but their performance ceased being acceptable

iv. things with well-defined purpose, and acceptable performance, but their users failed to use them for the intended purpose[12].

Similarly, waste is any human activity that absorbs resources but creates no value. By implication, it means that whatsoever human activity that only receives without giving out value(s) could be termed as waste. At this point, the bone of contention as to the un-clarification of at what point an item constitutes a waste could be balanced, drawing conclusion from the discussion so far. To be brief, we shall adopt our conclusion from the consensus of the Waste Framework Directive of the European Union that once a substance or object has become waste, it will remain waste until it has been fully recovered and no longer poses a potential threat to the environment or to human health[13]. Therefore, anything which is discarded or otherwise dealt with as if it were waste shall be presumed to be waste unless the contrary is proved. Waste, as a concept, does not exist in abstraction but has impacts as well as costs on nature and human. The scholar observes three different costs of waste. These costs include:

Environmental Costs

Waste can attract rodents and insects which cause gastrointestinal parasites, yellow fever, worms, the plague and other conditions for humans. Exposure to hazardous wastes, particularly when they are burned, can cause various other diseases including cancers. Waste can contaminate surface water, groundwater, soil, and air which cause more problems for humans, other species, and ecosystems. Waste treatment and disposal produces significant green house gas (GHG) emissions, notably methane, which is contributing significantly to global climate change[14].

Social Costs

Waste management is a significant environmental justice issue. May of the environmental burdens cited above are more often borne by marginalized groups, such as racial minorities,

women, and residents of developing nations. NIMBY (not-in-my-back-yard) is a popular term used to describe the opposition of residents to a proposal for a new development close to them. However, the need for expansion and sitting of waste treatment and disposal facilities is increasing worldwide. There is now a growing market in the trans-boundary movement of waste, and although most waste that flows, between countries goes between developed nations, a significant amount of waste is moved from developed to developing nations[15].

Economic Costs

The economic costs of managing waste are high, and are often paid for by municipal governments. Money can often be saved with more efficiently designed collection routs, modifying vehicles, and with public education. Environmental policies such as pay as you throw can reduce the cost of management and reduce waste quantities. Waste recovery (that is, recycling, reuse) can curve economic costs because it avoids extracting raw materials and often cuts transportation costs. The location of waste treatment and disposal facilities often has an impact on property values due to noise, dust, pollution, unsightliness, and negative stigma. The informal waste sector consists mostly of waste pickers who scavenge for metals, glass, plastic, textiles, and other materials and then trade them for a profit. This sector can significantly alter or reduce waste in a particular system, but other negative economic effects come with the disease, poverty, exploitation, and abuse of its workers. We shall now take a look at some of the wastes types that are of interest to the study[16].

There are so many types of waste on the planet earth but a few shall be mentioned here for the purpose of the study, these are: biodegradable waste, biomedical waste, business (or commercial and industrial) waste, chemical waste, medical (clinical) waste, commercial waste, construction waste, municipal solid waste, controlled waste and hazardous waste. A scholar defined

Biodegradable Waste as a type of waste, typically originating from plant or animal sources, which may be broken down by other living organisms[17]. Waste that cannot be broken down by other living organisms may be called non-biodegradable. Biodegradable waste can be commonly found in municipal solid waste (sometimes called biodegradable municipal waste, or BMW) as green waste, food waste, paper waste, and biodegradable plastics. Other biodegradable wastes include human waste, manure, sewage, slaughterhouse waste. Then, biomedical waste consists of solids, liquids, sharps, and laboratory waste that are potentially infectious or dangerous and are considered bio-waste. It must be properly managed to protect the general public, specifically healthcare and sanitation workers who are regularly exposed to biomedical waste as an occupational hazards. Biomedical waste differs from other types of hazardous waste, such as industrial waste, in that it comes from biological sources or is used in the diagnosis, prevention, or treatment of diseases. Common producers of biomedical waste include hospitals, health clinics, nursing homes, medical research laboratories, offices of physicians, dentists, and veterinarians, home health care, and funeral homes[18].

Business (Industrial) Waste: Cover the commercial waste and industrial waste types. Generally, businesses are expected to make their own arrangements for the collection, treatment and disposal of their wastes. Waste from smaller shops and trading estate where local authority waste collection agreements are in place will generally be treated as municipal waste[19].

Chemical Waste is a waste that is made from harmful chemicals (mostly produced by large factories). Chemical waste may or may not be classed as hazardous waste. Medical waste, also known as Clinical waste, normally refers to waste products that cannot be considered general waste, produced from healthcare premises, such as hospitals, clinics, doctor's offices, labs and nursing homes[20].

Commercial Waste consists of waste from premises used wholly mainly for the purposes of a trade or business or for the purpose of sport, recreation, education or entertainment but not including household; agricultural or industrial waste[21].

Construction Waste consists of unwanted material produced directly or incidentally by the construction or industries. This includes building materials such as insulation, nails, electrical wiring, and rebar, as well as waste originating from site preparation such as dredging materials, tree stumps, and rubble construction waste may contain lead, asbestos, or other hazardous substances.

Controlled Waste is a waste type composed of domestic, commercial and/or industrial waste. They are regulated by governmental institutions or acts, because of their toxicity or imminent hazardous nature, either in themselves, obtained during biodegradation or biochemical degradation.

Municipal Solid Waste (MSW), also called urban solid waste, is a waste type that includes predominantly household waste (domestic waste) with sometimes the addition of commercial wastes collected by a municipality within a given area. They are in either solid or semisolid form and generally exclude industrial hazardous wastes. The term residual waste relates to waste left from household sources containing materials that have not been separated out or sent for reprocessing. Having talked about some of the waste types, this study would be incomplete if we fail to bring to the fore what hazardous waste is all about[22].

Hazardous Wastes are solid, liquid, or gas wastes that can cause death, illness, or injury to people or destruction of the environment if improperly treated, stored, transported, or discarded. Substances are considered hazardous wastes if they are ignitable (capable of burning or causing a fire), corrosive (able to corrode steel or harm organisms because of extreme acidic or basic

properties), reactive (able to explode or produce toxic cyanide or sulfide gas), or toxic (containing substances that are poisonous)[23]. Mixtures, residues, or materials containing hazardous wastes are also considered hazardous wastes. Many dangerous substances can be used only with special precautions that decrease their risks. When discarded, these substances are no longer under the direct control of the user and may pose special hazards to people or other organisms that come in contact with them. The following are the main sources of hazardous waste;

Industrial Wastes

Hazardous wastes are generated by nearly every industry; those industries that themselves generate few hazardous wastes nonetheless use products from hazardous waste generating industries. For example, in the computer software industry, writing software generates little hazardous waste, but the manufacture of computers involves many industries processes. Making a computer circuit board generates spent electroplating baths that contain metal salts, and the production of computer chips uses acids, other caustic chemicals, and solvents. Other hazardous wastes are generated in the manufacture of fiber optics and copper wire used in election transmission, as well as magnetic disks, paper for technical manuals, photographs for packaging and publicity, and trucks for the transportation of the finished product[24].

Agricultural Wastes

Industry is not alone in generating hazardous wastes. Agriculture produces such wastes as pesticides and herbicides and the materials used in their application. Fluoride wastes are by-products of phosphate fertilizer production. Even soluble nitrates from manure may dissolve into groundwater and contaminated drinking-water wells; high levels of nitrates may cause health problems.

Household Wastes

Household sources of hazardous wastes include toxic paints, flammable solvents, caustic cleaners, toxic batteries, pesticides, drugs, and mercury from broken fever thermometers. Local waste-disposal systems may refuse these items. If they are accepted, careful monitoring may be required to make sure soil or groundwater is not contaminated. The householder may be asked to recycle or dispose of these items separately.

Renovations of older homes may cause toxic lead paint to flake off from walls. Insulation material on furnace pipes may contain asbestos particles, which can break off and hang suspended in air; when inhaled, they can cause lung disease and cancer[25].

Medical Wastes

It is important for hospitals to be particularly careful when handling waste soiled with blood and tissue and to segregate these hazardous wastes from ordinary waste. Health personnel must be particularly careful in handling needles, scalpels and glassware known as "sharps". Pharmacies discard expired and unused drugs; testing laboratories dispose of chemical waste. Medicine practices made uses of large quantities of radioactive isotopes for diagnosis and treatment, and these substances must be carefully tracked and disposed.

Harmful waste can poison the soil, air, and groundwater. Soil pollution can adversely affect soil-dwelling populations, plants that take root in the soil and wildlife that move through the soil. Pesticides that do not break down or link tightly to the soil can be consumed by growing plants; the toxic materials can then be absorbed by animals that feed on the crops being cultivated and possibly by humans who eat them. The atmosphere can be contaminated by the direct emission of hazardous waste. The air above hazardous waste can be perilously contaminated by escaping

gases, as can be encountered in houses built on top of mine tailings or former dumpsite. In the case of rivers and lakes, pollution, if highly toxic, can kill animal and plant life instantly, or damage it slowly. For instance, large concentrate of fluoride in water could cause dental and bone problems. Compounds such as dichlorodiphenyltrichloroethane (DDT), PCBs, and dioxins are more soluble in water and tend to accumulate in the body of plants and animals. The substances may occur in very small proportions in the water, but increase to larger concentrations in seaweed and insects, and grow to even higher degrees in fish. Birds or people feeding on these fish are then subject to very high levels of hazardous substances[26].

In birds, such substances can impair egg formation and bone development. Even pollution that is not considered toxic can kill. Phosphates and nitrates, which are mostly harmless, can enrich algae in lakes or rivers. When algae grow, in the presence of sunlight, they generate oxygen. But if the algae are allowed to grow too long or too quickly, they consume large volumes of oxygen, both when the sun is not shining and when the algae die and decay. The lack of oxygen ultimately causes other living things to suffocate; some living things can be plagued by the toxins in the algae. This chain of algal growth phenomena, called eutrophication, can kill life in lakes and rivers. Depending on the species or type of waste considered, the need for proper and efficient waste management in society becomes essential. Waste management is a matter of national interest and international concern. The extent of waste is not the main challenge, but the responsiveness of the governments, individuals and waste disposal operators to the duty of waste and general environmental management[27]. Certainly, a dirty environment impacts on people's livelihood, aesthetic awareness, health and hence the quality of human life. The implication is that the improper disposal or landfill of such waste can be a menace to society due to the pollution of air, land and especially water. The question remains, what then is waste management?

2.1.2 The Concept of Waste Management

The term "waste management" refers to the practice of collecting, holding, processing and disposing of waste in a safe manner for human and animal life, the ecology and the entire environment[28]. This is particularly significant since the goal of waste management is to enhance the quality of human life. Sustainable development is development that addresses the essential needs of the world today while ensuring that the potential for future generations to provide for their own needs is not compromised. The objective of the sustainable development model is to ensure that economic gain is attained while ensuring societal and environmental balance[29].

From a sustainable development perspective, waste can be used either broadly or narrowly. In a broad context, it can be conceived as covering various forms of pollution, varying from the disposal of toxins in the physical environment to their emission into the atmosphere. A narrow view, on the other hand, can be described as the end-products of production and consumption that are subject to targeted waste control policies. Sustainable development is inherently non-destructive management of non-renewable assets for present and future generations, which are non-renewable resources, to be used at a pace that is neither too rapid nor too slow, and so that the natural endowment they represent is transformed into long-term wealth.

In Nigeria, we express it concisely as development that is sustainable without prejudice to future development, which signifies that in the exploration and harnessing of the natural assets that sustain us, there exists a distinct contradiction in the need to sustain the level of economic development, while safeguarding the state of the environment. It is important to consider the fact that there is a trade-off between the scale of development and the existing stock of natural reserves. Mass media which including printing media have conceptualized waste as an

undesirable item that is no longer useful or valuable. In Germany's Waste Bill, waste is defined as "portable articles abandoned by their owners" and as "waste disposed of in an appropriate manner". In the UK, the waste framework guideline stipulates that waste is a material and/or object that is discarded by its owners in a environmentally friendly way. This is followed by sixteen existing categories of waste[30].

Waste is clearly defined as those materials generated by day-to-day activity over which we retain control in terms of their generation, removal or disposal. Waste can be regarded as any item or substance that the generator intends discard (this comprises food waste, household wastes such as electronics, newspapers, rubber containers and product packaging, debris and construction waste and other types of inorganic waste from residential, commercial and institutional sources), which is collected and disposed of by local authorities and which may be in solid or semi-solid form.

The Mexican perspective of waste, is outlined in the General Waste Reform, which refers to a material or product that is removed by their owners, which might be in a semi-solid or solid state, as well as a fluid or gas in a tank or discarded, and which can be recycled, treated or disposed of according to the regulations in place. Wastes are further classified into categories such as municipal solid waste (MSW), agricultural and animal wastes, industrial residues, mining and quarrying wastes, construction and demolition debris and sludges, among others. Waste management consists of "the actual collection, transportation, storing, processing, recycling and disposal of waste". Both of these are consistent with the Mexican interpretation of waste management as all aspects of waste classification and labelling, separation, storage and transport, transfer, treatment and final disposal[31].

Waste is in fact any substance that is a trash, sludge or other unwanted extra substance left over from the operation of a process, or any substance or item that has to be discarded due to breakage, wear and tear, corruption or other degradation. On the other hand, any material that has no value to the user and must be disposed of is considered waste. The main point of agreement between the two concepts is hence the issue of value, which is to be determined by the owner or originator of the waste. Furthermore, waste is described as any substance or object which the owner discards or intends to dispose of and which is classified in one of the following categories

a. Production or domestic waste.
b. Product that has expired after its intended use date.
c. Contaminated or oily materials[32].

Waste management refers to the collection, transport, recovery and disposal of waste, including monitoring of such operations and the supervision of disposal sites. As a descriptive definition, like waste, waste management should be interpreted to entail the collection, transport, recovery and disposal of objects that are discarded by their owners. Clearly, this suggests that waste management is solely the handling of discarded objects, so waste management is an activity about the material. The word "management" actually denotes a handling of activity, and it is argued that waste management embraces more than just the treatment of waste[33]. As illustrated in the above section, transforming waste into non-waste requires a range of actions relevant to waste management. Waste management involves strategic scheduling, prescribing options, averting environmental contamination and conserving natural resources, downsizing and minimizing the amount of toxicity of the waste created, determining the most appropriate disposal option, complying with legislation, evaluating effects and consequences, and making decisions[34].

In order to devise the optimal waste management plan, it is essential to determine the relevant theoretical context. A waste management system will be required that encompasses the following concepts:

i. Waste management is about containing waste from negatively impacting human health and the environment.
ii. The ultimate goal of waste management is resource management.
iii. We will not generate waste by creating mainly valuable items.
iv. Waste management embodies the goal of transforming waste into non-waste objects[35,36].

Solid wastes are unused items that have no value and no subsequent use and which are sought to be disposed of; they consist of unusable residues in the waste substances that are discarded by society. As civilization and human development advance, the waste created has grown more sophisticated in nature since the garbage yield is driven by the population, thus population growth and urbanization will largely cause the rise of solid waste. The current global municipal solid waste (MSW) rate is approximately 1.3 billion tons daily[37]. However, the urge to tackle this challenge in a technologically, economically and socially viable path is imperative for each nation in the world.

The solid waste recycling hierarchy is an established, internationally approved and recommended practice that utilizes the top-down order of priority: open burning, landfill, incineration, recycling, reuse and curtailment. Open burning and landfilling are the two least preferred methods and are not encouraged, yet are practiced in many less developed countries. The municipal solid waste management challenge differs in degree in different cities, nations and regions of the world. At present, an average of 54% of the population of the world is living in urban centers and this is forecast to rise to 66% by 2050. About one-third to two-thirds of solid

waste generated remains uncollected and is subsequently dumped into the streets and drains, resulting in flooding, pest breeding and the dissemination of disease[38].

2.1.3 Global Dimensions of Solid Waste Problems

Solid waste is classified on the following basis, they are as follows:

i. Residential and municipal waste: which are the wastes coming from residential area like houses and apartments. This waste material consists of food remains, vegetables, peeled materials, plastics, wood scraps and clothes. It also consists of waste from demolition, new construction and street cleaning.

ii. Business and Institutional waste: This is waste from commercial stores, hotels, offices, markets, medical facilities, etc. Waste from institutions is known as institutional waste and includes paper, food, glass, metals, etc.

iii. Agricultural waste: all waste from agricultural operations is known as agricultural waste, such as manure and other agricultural waste from farms and poultry houses.

2.1.4 Factors that Influences the Practice of Waste Management

2.1.4.1 Solid Waste Management and Financial Factors

For a scheme to be truly sustainable, it is important that both long-term financial costs and short-term operating costs are accounted for. The financial elements of solid waste management pertain to cost budgeting, cost accounting, capital investment, cost minimization and cost recovery[39]. Financial resources are concerned with operating expenditures for waste collection, financial costs, cost reduction and control, cost recovery, and ongoing operational funding. Hence, adequate budgeting, financial accounting, monitoring, and financial evaluation are very critical to the success of solid waste management schemes. Nevertheless, municipal solid waste managers do not have adequate financial costing information for operations, owing to a lack of

skill in using the existing financial mechanisms and tools[40]. In most Third World countries, where local boards are weak and without financial resources, financial capacity is the primary reason for the failure to adequately collect and dispose of solid waste. Running costs are the costs of personnel, fuel and servicing. In addition, financial costs include the cost of owning the vehicles, including the amortization of the vehicles, and collection costs include waste pick-up fees, government incentives, and fines for littering. In summary, the bulk of global solid waste management expenses are borne by sweeping and collection services. The key reasons for inadequate waste collection and disposal are associated with lack of funding, inadequate infrastructure capacity to properly manage solid waste, poor employee morale in the waste sector due to poor wage, absence of training, and lack of expertise and manpower to manage solid waste[41].

Budgetary limitations are commonly reported in developing countries with scarce resources and poorly managed outreach of these scarce inputs; many cities strive for a quality of service that is acceptable given these financial constraints[42]. Another key bottleneck observed across the developing countries is the absence of public awareness and proper waste management practices. In addition, the way to implement waste management is to upgrade the position of financial resources, the cost of operations, and the management of cost collection of waste. solid waste manager's see technical inefficiencies is a key setback in developing countries and it also supports the view of waste management system in developing countries displays a series of problems, but a major contributing factor of this setback is poor and inadequate technical aspects. Financial constraints on almost all local governments encourage a trend of focus only on short-term operating costs and overlook longer-term financial costs. However, this trend will lead to a crisis in a few years[43].

Financially, the local government needs to assign sufficient funds to solid waste management, upgrade collector payment levels, create user incentives and devise revenue collection systems. Fiscal constraints, improper service coverage and regulatory failures, poor technology and equipment, improper landfill disposal, and low utilization of recycling incentives are all challenges in solid waste management[44]. To address the financial constraints, there is a need for municipalities to adopt policies such as waste separation, door-to-door collection, daily or bi-weekly waste collection, and diversion to landfills of waste that is not suitable for recycling or composting. The financial efficacy of Solid Waste Management is based on long-term life cycle costs and economic impacts. Therefore, financial assessment is a key component of both strategic planning and investment programming. Furthermore, unless funds are continuously provided without any lag or deferral, it is not feasible to run a consistent waste collection service and any scheme that has been put in place will rapidly collapse and shut down[45]. One of the major factors in the failure of collection services is the shortage of financial resources to handle the increasing volume of waste being disposed of. The majority of financial costs are allocated to sweeping streets, collecting and carting waste, and no financial incentive is spent on modern disposal mechanisms such as landfill or incineration due to inadequate funding. Improving the financial performance of solid waste management can be realized by attaching the solid waste charge to the billing for another service, such as water supply, according to the report. Owing to the scarcity of both funding and resources, the management of solid waste is becoming a daunting task as it is being massively produced. Uncivilized disposal of solid waste has adverse effects on the environment and human health. The most sustainable means of MSW management is often difficult to identify with regard to legislative, environmental, economic and social restrictions[46].

2.1.4.2 Solid Waste Management and Technical Factors

The technical dimensions of solid waste management involve the planning, deployment and maintenance of waste collection and disposal systems, waste recycling, eventual disposal and proper management of toxic waste. Ineffective technology and equipment is yet another source that can further fuel inadequate service capacity and operational failure. Inadequate collection, disposal, and dumping of waste is the result of poor technical standards. Collection includes household bins, trucks and equipment for primary and secondary collection. The lack of up-to-date and proper waste collection equipment, the lack of routine training, and the unaffordable availability of spare parts for equipment and vehicles that are faulty or worn out are among the factors that negatively influence waste disposal patterns to a greater extent. If the drum is shared by households, there is a chance that waste will be disposed of nearby and this will deter others from placing waste in the drum. All forms of waste are a product of the absence of waste management and control, and the management and control of solid and liquid waste continues to be a huge concern in all urban areas of Somalia[47]. However, the techniques that have often been employed in the past are not sufficient to ensure that waste management is technically effective, and the local authorities should provide suitable waste collection systems with skilled personnel, and the available modern vehicles and equipment to minimize environmental health hazards. However, techniques that have often proven effective in developed countries are ineffective in developing countries because they often lack the infrastructure and expertise to properly manage these technologies[48].

Third world nations have limited sanitary landfills and their disposal sites are situated miles away from the communities, thus creating more cost burdens as the burden of waste collection, transportation and disposal costs are very challenging. With a lack of spare parts and scarce

funds, Solid Waste Management is not able to provide effective management of solid waste storage, collection, and transportation. Gridlock, urban infrastructure, narrow roads, and difficult road conditions to the disposal site all contribute to the failure to collect solid waste efficiently, according to reports. To overcome the technical aspect of municipal solid waste management, the facility technology must be specifically selected to meet performance, maintenance and life-cycle cost objectives, and sources of hazardous waste must be tracked to ensure that infectious medical waste does not occur[49].

2.1.4.3 Solid Waste Management and Social Factor

The social approaches to Solid Waste Management address waste creation and handling; community-based waste management; and the welfare aspects of waste workers. Public outreach and knowledge about waste influence people's readiness to collaborate and participate in sustainable waste management practices. The principal concerns in solid waste management are lack of awareness among the public, the status of waste workers, and the absence of private sector and societal engagement[50]. Low public awareness, absence of decent pay and benefits, and low morale among waste workers are all identified as factors that impact on the efficacy of solid waste management. There is a shortage of awareness and concern for secure and reliable waste disposal among most health care workers, and there is no adequate funding available for the effective execution of safe disposal routines for medical waste[51].

2.1.4.4 Solid Waste Management and Institutional Factor

Institutional considerations pertain to the division of functions and duties and reflect organizational units, procedures, methods, institutional structures, and private sector engagement. The key to successful solid waste management is the inclusion of diverse entities and groups in a

collaborative partnership, such as the national government, the local government, the private sector, and the informal business sector. Local government is often in charge of SWM, or it is contracted to the private sector, which handles sweeping, collection and disposal services[52]. Physical collection, which is a house-to-house pickup, and transportation to the collection facility are often managed by community-based organizations or small businesses and are often started by residents desperate for a pickup service and also willing to pay a monthly collection service charge[53]. To ensure that municipal solid waste management is more responsive, the institution should delegate responsibility, build capacity for strategic planning and sound financial management, and involve the private sector via tendering, regulatory instruments, and monitoring and oversight systems[54].

2.1.4.5 Political Factor

The political dimensions of waste management services relate to the articulation of objectives and principles, the establishment of roles and jurisdictions, and the legal and administrative framework[55]. The central government typically plays a minor role in waste collection services, but contributes greatly to policy discussions on the extent to which private sector involvement is required, controlling solid waste management expenses, and occasionally funding employment in some instances[56]. Local government is commonly engaged in the delivery of solid waste services, often working within a national instead of local legal structure, which makes it challenging to alter the existing legal status to accommodate local factors, including private sector and community participation. Obsolete policy and lack of expertise in reuse and recycling, coupled with inadequate enforcement, all contributed to the inefficiency of solid waste management. To raise the livelihood of the population, such policies are urgently needed; for instance, a public-

private partnership is one option to tackle the failure to handle solid waste management operations[57].

For sustainable waste management, there must be clear and enforceable policy and regulations, and there must be an oversight body to supervise the promulgation and application of such policies. The failure to enforce solid waste policies is the real challenge to sustainable waste management[58]. Nevertheless, a clear and simple legal and statutory framework that includes operating and enforcement mechanisms at the national, state and local levels is essential for the proper functioning of Solid Waste Management. Several challenges, such as financial constraints, inappropriate technologies, insufficient manpower and enforcement, play an integral role in the practice of sound solid waste management[59].

2.1.5 Concept of Municipal Waste Management

Municipal solid waste is typically understood to be household waste and all associated waste gathered by a solid waste collection agency or its agents, including waste gathered from parks, beaches, commercial businesses, offices, industries, and landfills[60]. Yet other scholars persist that municipal solid waste includes all non-air and wastewater emissions generated in a community from domestic, commercial, and industrial (non-hazardous) sites and collected by both private and public bodies[61]. The European Union Landfill Directive, Article 2(b), broadened the scope of the definition by defining municipal waste as waste from households as well as other waste that is inherently similar in nature and composition to waste from households. This implies that municipal waste commonly includes biodegradable materials such as paper, wood, textiles, food, and yard waste, as well as non-biodegradable fractions such as glass, plastics, tires, and bottles.

The various sources of these wastes in a community may include: Residences, institutions, commercial organizations, community services, allotments, and treatment facilities. Municipal

solid waste generally includes all neighborhood wastes except industrial, agricultural, and hazardous wastes[62].

2.1.5.1 Background to Municipal Waste Management in Developing Countries

Across the world, municipal waste volumes have continued to escalate in line with the challenge of growth in other socio-economic variables such as population, income and consumption behavior. In the last two decades, per capita waste generation in developed economies has grown almost threefold. Waste generation in developing countries is rapidly increasing and could double in total during this decade, largely due to population growth and better living standards. If present trends persist, global municipal solid waste generation is expected to increase fivefold by 2025[63]. Sub-Saharan Africa's share of the predicted growth in MSW generation in developing countries is difficult to estimate. It is questionable whether the complex interrelationship between Management of Solid Waste generation, greenhouse gas emissions, and climate change will impact the region more or less than other regions of the world. It is therefore of strategic national and regional importance to determine the current situation of municipal waste[64].

2.1.5.2 Municipal Waste Management in Africa Sub-Sahara

Prior to the late 1980s, municipal waste management in most of Sub-Saharan Africa had practically had no nationally coordinated architectural or policy framework on which to build. Though local governments were often mandated by law to perform this task, most had no capacity to do so[65]. As a result, waste management is quite often ranked low on their priority list. On the few occasions when supervisors were tasked with Solid Waste management, they hardly ever had all the skilled staff, such as planners, managers, or field staff and technicians. Since most of the Solid Waste management staff in these organizations were almost always low-ranking employees, they lacked the ability to influence financing decisions[66]. As a result, funding

is often inadequate and consequently operational capabilities are diminished. As a result, waste is often dumped by residents in any location and over time tends to accumulate into open dumps, which are ubiquitous in many cities in Sub-Saharan Africa.

Recently, due to the increasing awareness of the harmful effects of waste on the environment and the positive changes in the socio-economic conditions of some countries in the region, governments have started to implement policies, programs and institutions to improve the management of solid waste at all levels. In order to fully understand the current characteristics of solid waste and management practices in the region, a country-specific study is needed in line with the main objectives of this study. Therefore, the composition and Management of Solid Waste in four countries representing the major regions of sub-Saharan Africa were studied: South Africa, Kenya, Ghana, and Nigeria were studied.

2.1.5.3 Management of Municipal Waste in South-Africa

The main South African policy paper on pollution and integrated waste management, Pollution and Waste Management White Paper, was released in Gazette No. 227, 2010. This policy paper outlines the overall waste management objectives of the country[67].

Even though the paper included a straightforward strategy towards the inevitable waste management, the core policy orientation of this document was founded upon the waste prevention, resource minimization & utilization concept. Before adoption the overall ownership of the South African waste policy was fragmented among a number of institutions of government, in some cases having contradictory interests and aims. This strategy of piecemeal enforcement proved to be often counterproductive[68].

A nationally coordinated approach to waste management was adopted under the new policy, thus rationalising legislation on waste and its application by the various bodies of government. Within

this process of reform, the Department of the Environment, with a sub-unit dedicated to waste contamination issues and the management of waste, was created as the ultimate authority in government on matters relating to waste. Identical structures were already in place in the States[69]. Further to these modifications, in September 2001 South Africa committed to the implementation of an extensive municipal integrated solid waste management agenda through the Declaration of Polokwane.

2.1.5.4 Management of Municipal Waste in Kenya

The Ministry of Environment and Natural Resources (MENR) and the Local Government Ministry are jointly accountable for managing solid waste in Kenya. The key waste management responsibilities of those respective ministries comprise: legislation on the environment, formulation of policies, planning, implementation, environmental monitoring as well as monitoring and appraisal, granting of waste operators' licensing and permits, and environmental standards implementation, to name a few[70]. In Kenya, as in most countries, local government agencies are primarily in charge of collecting, transporting, recycling, and disposing of waste in their jurisdictions. In 1992, USAID and the World Resources Institute (WRI) both estimated that these agencies were capable of performing only 50-70% of their municipal waste collection and disposal, for which they incurred more than 30% of their budget for the year[71].

Currently, there are no engineered landfills in Kenya, so disposal of solid waste is carried through open waste dumps, with adverse consequences for the environment. The management of solid waste in Kenya is in fact still heavily centralized, meaning that decisions on operations in the majority of environmental departments in the councils frequently have to come from the

management level first. As a result, long delays often ensue the simplest tasks before they are carried out. Of late, a couple of councils in Kenya have been making a number of contractual deals with waste management companies in the private sector to complement the waste efforts of the councils' waste departments[72].

2.1.5.5 Management of Municipal Waste in Ghana

The situation in Ghana is indicative of the majority of Sub Sahara African countries when it comes to the absence of solid waste data. In the view of the Commission, it is unlikely to be attributed to a policy and institutional framework that is lacking. It is most likely the failure of Ghana's situation to follow from the failure of established governance frameworks to marshal human, physical, and resource resources to meet the goals desired. Like most Sub-Saharan African countries, environmental policy in Ghana since independence in 1957 has followed in line with European models of large-scale, favorable-market development of industry[73]. In 1974, a regulatory body, the Ghana Environmental Protection Council (EPC), was formed, succeeded by the enactment of the 1985 Act 116 of the Provisional National Defence Council (PNDC), later replaced by PNDC Act 207 of 1988, making the Provincial Districts Assemblies the authorities with jurisdiction over matters of pollution management.

It is worth noting here that in spite of the Environmental Protection Council's establishment in 1974, Ghana did not have a formal process for environmental assessments until 1994, when the EPC was converted into the Legal Environmental Protection Authority on the basis of an Act of Parliament. However, this necessitated the creation of a fledged Environment Ministry responsible for national-level policy issues[74]. By 1988, Ghana had developed a Plan of Environmental Action, a strategic document embedded in Ghana's Structural Adjustment Program (SAP), which emphasized greatly agriculture, mining, forestry, as well as sustainability

in the manufacturing sector. In spite of this advancement, the key questions of managing development projects in a manner that is environmentally sound have rarely been tackled in a conjunct format to date[75].

2.1.5.6 Management of Municipal Waste in Nigeria

Socio-economic and Demographic Background

Located in the West African sub region at 10o 00' geographic coordinates, in an area of 910,768 km2, it is one of the world's most populous countries. It has a climate that varies ranging between equatorial in the south to arid tropical in the center and drought climate of the Sahel in the extreme north[76]. The official population of Nigeria is believed to be around 200 million and is estimated by the National Population Commission of Nigeria to be growing at an annual rate of 2.9%[77].

Administratively, there are 36 states in Nigeria, which excludes the Abuja Federal Capital Territory. Meanwhile, sustainability is a major challenge for the economy. 2015 Nigeria illustrates the massive challenges of solid waste development that are present in the majority of Southern Hemisphere countries, as it struggles with the double burden of both waste generation as well as a rapidly growing population base that is at present untenable[78].

A key implication of these economically induced dynamics is for certain parts of the metropolitan population to frequently be no longer able to pay for fundamental services provision, exemplified by the lack of water supply and improved sanitation. Consequently, as a result, they take to self-reliance and resettle on the peripheries of urban areas in such informal settlements as are commonly described as slums. Such developments are part of the urban landscape in sub-Saharan Africa[79].

Africa's most populous country is Nigeria. In the last 50 years, the country has recorded the third fastest growth rate in urban areas worldwide 163 rate of 5.51% annually. At about 45%, Nigeria's adult literacy ratio is higher than the mean for countries in the developing world in comparison to others in the developing nations like India (57%) as well as countries in Southeast Asia (56%), based on the published World Development Indicators (WDI) from the World Bank[113]. Despite 2006 statistics from the Central Bank of Nigeria estimating the Gross Domestic Product of the country at $176.7 billion, showing an average of 8.3% growth, there is still more than 70% of the populace subsisting on under $1 daily[80]. In 2000, the wealth of the top 2% of people was as great as for the bottom 55%. This lopsided economic performance has been argued to be at the root of the urban slum phenomenon in Nigeria, like we can see in many other developing countries. Waste management has influenced the urban areas a lot and it has been one of the major issues affecting the areas in Nigeria[81].

2.1.5.7 Policy and Institutional Frameworks for Municipal Waste Management in Nigeria

Procedures for collections and management of solid waste in the majority of cities in Nigeria are primitive at best. Consequently, gross efficiencies in waste management are commonplace. For instance, some city authorities spend from 20% to 50% of their yearly operating budgets on management of fixed waste, although less than half of the city poor are serviced by these services[82]. From the beginning of British rule in the 1900s, the colonial provincial policies and plans for development included few, if any, claims for the maintenance of our natural features of the environment.

Thus, it may be posited that the earliest years of Nigeria's institutional environmental governance were notable for lack of a firm commitment and focus on both waste generation and wildlife protection management. However, disagreed that this view was valid, pointing out that not much

is known about the waste systems management in pre-colonial administration Nigeria[83]. However, the earliest types of legislation on the environment, including the 1909 Public Health Act, the 1917 Township Ordinance No. 29, as well as the 1946 Town and Country Planning Ordinance, for example, all came into being under the administration of the colonial government and attest to its emphasis on the protection of the environment in general as well as on waste management in specific. However, the genesis of the Nigerian waste management crisis is rooted in the period immediately post-colonial[84].

The Federal Government of Nigeria (FGN) created the Federal Environmental Protection Agency (FEPA) in 1988 as a reaction to the severe environmental disruption challenges epitomized in the dumping of dangerous wastes by an unverified Navy vessel close to Koko Port in the region of the Niger Delta. FGN Decree 58 of 1988 entrusted the agency with the following tasks, including:

i. To provide the Federal Government with advice on issues concerning the national policy and environmental priorities as well as environmental science and technology operations affecting those areas.
ii. Develop comprehensive plans for the advancement of such environmental science as well as related technology at regular intervals throughout the country, and to advise the Federal Government on funding needed for the execution of those needs.
iii. Foster environmental science and technology collaboration with analogous agencies in other jurisdictions and international agencies involved in the environmental protection of the natural environment.
iv. Collaborate on environmental protection issues and facilities with Federal and State departments, local governments, statutory corporations, as well as institutions of research.

v. Carry out any other actions deemed reasonably incidental or appropriate to the complete discharge of the responsibilities of the Service pursuant to this Decree 169.

Modeled on the central government, in the mid-1990s each state level government also instituted a State Environmental Protection Agency (SEPA). However, at the municipal or local level, the responsibilities of environmental regulation as well as management were still left to the discretion of the various environmental agencies. Basically, Nigeria, like most SSA countries, operates a three-tiered approach to pollution/waste management, i.e., central, state, as well as local environmental agencies. In 2000, FEPA was elevated to a fulsome federal environmental body with a state cabinet minister after the establishment of a new civilian government and the rise of the environmental agenda globally. Currently, following these environmental institutional reforms, total regulatory and management responsibility for the environment in Nigeria rests with the Ministry of Housing, Federal Environment and Physical Urban Development[85].

However, 2015 was the last year in which the federal ministry was involved in sustainability management. Nigeria's first policy document on environmental management was issued in November in 1989 and contains orientations for the realization of environmental leadership for achieving environmental leadership in fourteen major Sectors, including urban waste. Many people praised this strategic policy document for being a milestone for the rest of the SSA states[86]. However, as commendable as it was as a step, the policy paper was quickly subjected to a number of criticisms, particularly due to its restricted application area and lack of applicability in practice. The Strategy Paper has been revised as a response to this concern. A beneficial effect of these trends in the solid waste sector was the 1990 adoption of the Hazardous Waste Regulation, an ordinance that offers a legal policy for managing wastes, particularly hazardous

wastes. In 1992, in response to criticism of the FEPA regulation, the government published an amended version[87].

2.1.5.8 Composition of Nigeria's Municipal Waste

It is difficult to determine overall estimates of the volume of solid municipal waste that is produced in Nigeria. A number of studies, however, have estimated per capita generation of waste. Sustained increase in urban population is projected to drive waste growth. Additional variables that were investigated as per the extant literature discussed include the moisture level, bulking density, as well as analysis of chemical composition. Municipal waste from cities including Kano, Ibadan, Lagos, as well as Makurdi, typical, we can infer that fluctuation in the quantity of generated Municipal Solid Waste as well as its composite can be traced to alterations in the generating community's socio-economic attributes. The implication is obvious that reliance on underlying socio-economic variables impacts on both the amount and its composition of generated solid waste[88].

2.1.5.9 Collection of Municipal Waste in Nigeria

MSW recovery is the hardest as well as the costliest dimension of managing solid waste in emerging nations. Given the haphazard nature of majority of Nigerian cities, such task can be discouraging at various times. Ineffective waste collection programs frequently create waste buildups that generate nuisance problems, problems with odor, create pollution and fire danger, and pose a general danger to the people's physical welfare. A glance at the literature available indicates that in Nigeria, there are two primary methods of collection: The door-to-door method as well as the depository or communal disposal method[89].

2.1.5.10 Waste Collection from Door to Door

Standard collection bins are infrequently made available to households in the majority of sub-Saharan Africa. Most notably, in Nigeria, there are many poor and moderate-income households that use whatever bins are available, such as baskets, cans, buckets, open barrels, as well as occasional black garbage bags, for collecting waste. In consequence of the large organic and moisture content and high temperature, waste accumulated in such low-quality containers rots quite quickly, leading to undesirable consequences for the environment. In comparison, higher-income homes as well as agencies use standard receptacles with lids for trash collection. Waste collection from door to door involves good design and management. Waste collectors show up on scheduled days to fill and empty the receptacles and transport them to dump sites. This system requires minimum staffing and facilities, as well as good site accessibility. Where these preconditions are not in place, the system soon collapses[90].

2.1.5.11 Communal/Depots Collection Facilities

In residential areas with limited access, waste from households is taken to municipal collection facilities, which is sometimes referred to as bring storage. Storage collection sites may be in the nature of bins or other specially constructed facilities. On certain designated days, collection crews from local authorities or private waste management companies come to empty the facilities. Usually, the collection bins are centrally located so that they are easily accessible to the entire community and the collection crews[91].

2.1.6 Transfer, Disposal and Recycling of Municipal Waste in Nigeria

2.1.6.1 Resource Recycling/ Recovery

Waste recycling through reclaiming resources holds tremendous potential economically, notably for poor city dwellers across many countries in the developing world. In Nigerian cities in

particular, multiple MSW recycling studies have been performed. Based on the findings of the literature, there are several benefits to the economy and the environment from recycling. Recycling of solid urban waste is at very vestigial level in Nigeria. The reason for doing so is due to the fact there has not been much focus on recycling by its government, resulting in practically no policies and structured to deal with these practices on an effective basis. Lagos happens to be the economic capital of Nigeria has no material recovery facility and this situation is not quite different from other state in Nigeria.

2.1.6.2 Informal Sector of Municipal Recycling in Nigeria

Waste in cities in Nigeria has in-turn created jobs for the urban poor, who did not find a suitable job to do and are forced to the dirty jobs like scavenging, despite the apathy that the government said they are showing towards economic recovery, there had been a little or less changes in the economic standard of the country especially those living below the poverty line in Nigeria.

Materials such as Plastic, metals, glass and paper which is more of higher market value has been found out by research as the only commodity been recycled and recovered in Lagos.

Research conducted by expert in the field shows that 70% to 83% of underemployed and unemployed youth which consist of majorly males in three major cities of Nigeria (Port Harcourt, Nsukka and Onitsha) always prefer to scavenge their materials from an open dumpsite and some goes from bin to bin in a good and rich environment or house to house that they know they can find a useful and good materials. The Northern parts of Nigeria always refer or nickname the scavengers as 'Mai bottle' while in the southern part they always call them 'Ndi-Ebulu or 'Baro Boys[92].

These unemployed youth that does this kind of business always have to two motives of doing the business, they can either keep the materials they scavenge for themselves as personal use or they sell them to the middlemen who in turn sort and sell it to the companies that are of small scale around the cities or other parts of the country. The average earnings of these scavengers daily sum up to $5 as of 2018, while those that serves as middlemen part with much higher profit that the scavengers. Activities like this is of great importance and it environmental friendly and it also reduce poverty in a country such as Nigeria that has over 60% of her population living and struggling below $1 a day[93].

2.1.6.3 Municipal Waste Composting in Nigeria

Municipal solid waste composting reduces the amount of waste and haulage costs while at the same time creating economic and employment opportunities. Traditional Nigerian households made effective use of composting as a management strategy for solid waste generated within their surroundings recorded that waste generated from households such as yam peels, banana leaves, maize cobs, and egg shells were usually deposited in the backyards where they were allowed to decay for subsequent utilization as manure during the planting season. Despite this long-standing composting tradition, post-colonial Nigerian communities have only made limited use of composting as an effective municipal solid waste management strategy, in a survey of farmers use of urban waste in Kano, stated that the huge potentials for compost production in the City has not been exploited as a result of government's apathy in providing the required structures for this purpose[94]. This same situation is true for many other cities in the country. It is estimated that over 60% of Nigeria's adult population are engaged in agriculture as a source of livelihood while the government subsidizes fertilizer importation to the tune of 70%. Compost production as a waste management option therefore has an added advantage of economic

enhancement for Nigeria while at the same time achieving desired environmental sustainability objectives[95].

2.1.6.4 Municipal Disposal and Transfer in Nigeria

There is need to transfer all waste generated from either households or communal facilities in a safe and efficient manner to recycling facilities or final disposal site. Efficient transfer of waste in Nigeria is however difficult due to the peculiar characteristics of tropical waste streams, terrain and other barriers[96]. In most parts of the country, waste transfer is still carried out haphazardly with wheel barrows, carts, open trucks, lorries, tippers and more recently by compactor trucks. As the most common means of transporting waste are open trucks and lorries, it is not uncommon to see street littered with waste dropping from vehicles in transit. There is need to properly dispose of all collected waste in a safe and sustainable manner so as to avoid any negative environmental and health impacts.

Various methods of waste management have evolved over the years such as burning, open dumping, landfilling, composting, incineration, disposal into the sea, pyrolysis, recycling etc. In respect to municipal solid waste management in Nigeria, Lagos for instance, dump their waste at any location that suits them because there are no defined waste disposal points in the City. This situation best mirrors the state of waste disposal in Nigeria. Open dumping and burning are still the most prevalent waste disposal methods in the country. The very few landfills that exist in the country are neither engineered nor secured; as a result, waste dumped at such dump sites eventually find their way back to block access ways, drainages, farmlands and water bodies[97].

2.1.7 Historical Background to Oyo State Waste Management Agency (OYOWMA)

Lying in South-Western region of Nigeria, Ibadan is the capital city of Oyo State. Largely, one can find the capital city in the lowlands, interspersed throughout with a number of rocky foothills

and a range of hills. Altitudes range between 150m on the valleys level to 275m higher than sea level[98]. There are three major rivers draining Oyo State; Ogbere, Oja Ogunpa and their sub tributaries including Kudeti, Omi, Alapata and Alaro . This combination of hilly terrain as well as stream channels ensures proper city drainage, on the other hand, the waterways get blocked frequently due to the presence of solid wastes as well as the erection of structures lining the riverbanks. It has an equatorial weather, characterized by both dry and rainy periods, as well as fairly high humidity. Its dry season runs through November to March, while its rainy season commences by April ending in October. The average annual precipitation is 1,150 mm. The daily average temperature is between 25°C and 35°C most of the year[99].

In terms of administration, there are 33 local government areas in Oyo State. Ibadan, the capital, has 11 Local Government Areas: The Ibadan metropolis is composed of five LGAs which make up the "city center": Ibadan South-East, Ibadan North-East, Ibadan South West, Ibadan North West and Ibadan North; the other six LGAs make of the suburbs of the metropolis. In terms of the council, the Local Governments Boards consist of Executive Arm, which includes the Chairman of the local government, Vice Chairman, the local government Secretary, as well as the Councilors of the Supervisory Council. The population of Greater Ibadan was nearly 2.6 million and the number of households was 616,103 according to the 2006 National Population Commission census. The 2014 Ibadan Urban Flood Management Project Annual Population Growth Report shows about 3.2%, which means that the population of Ibadan metropolis was about 5.4 million people in 2015. Furthermore, it is possible to classify the metropolis into seven different types of morphological regions: government reserved area, new western suburb, the older suburb, the core, the post-1952 suburb, newer eastern suburb. There is no credible

information that can be generated to show the average income of individual household we have in Oyo state[100].

2.1.7.1 The Legal and Institutional Framework of Waste Management Agency in Oyo State

In Nigeria, the environmental framework is charged with the handling and protection of solid waste management. The next sub-sections will give full details on how the law apply to Oyo state, federal level and as well as the private sector.

2.1.7.2 Federating Level

According to the 1999 constitution, section 20, the responsibility to protect the environment is enshrined on the federal government. The constitution says that: "The state shall protect and improve the environment and safeguard the water, air and land, forest and wild life of Nigeria"[101]. The constitution also specifically assigns the responsibility of environmental sanitation to the Local Government. Under this constitution, local government is also giving a special responsibility on the sanitation of the environment. The protection of environment, conservation of natural resources and sustainable development is the responsibility of the federal ministry of environment.

A set of guidelines and policy were developed in 2005, in order to specify the responsibility and roles each tier of government needs to play in management of waste and how it would be run. The policy recommended four options for the management of solid waste; which is as follows:

i. By government at the local level/ agencies of the municipalities
ii. Companies which are private and has a contract with the local government areas.
iii. Companies which are private and has a solid contract with home owners and
iv. Public private partnership

There has not been a concrete development of the companies that are private at the federal level in the areas of solid waste management, the policies and guidelines has not been effectively implemented like so many other environmental laws we have in Nigeria. Bodies such as National Environmental Standard and Regulation Enforcement Agency (NESREA) is charged with the regulations and enforcement of environmental law and as well as overseeing the waste management. The agency (NESREA) replaced Federal Environmental Protection agency when it was established in 2007[102].

The legal framework for waste control and management was provided in 2009 by National environmental sanitation. These legal frameworks give a proper guideline of how solid waste is managed, handling of waste by person licensed to carry it out, how it is transported and finally and how waste is disposed and managed at the facility.

2.1.7.3 Regional Level (Oyo State)

Oyo State is made up of the jurisdictions of several autonomous Local Government Areas (LGAs). While it is formally possible for states in Nigeria (or indeed cooperating LGAs, with state approval) to establish coordinating or planning authorities for cities, these cannot (for constitutional reasons) be recognized or considered as municipal governments with their own 'fiscal' or administrative identity[103]. In addition to all their other responsibilities, state governments, such as Oyo State, also perform as municipal managers. Solid waste management in Ibadan is the responsibility within three bodies, each with distinct responsibilities:

a. The state government and the (state) Ministry of Environment and Habitat.
b. The local governments
c. The Oyo State Solid Waste Management Authority (OYOWMA).

As the head of the State Executive, it is the Governor of the State which makes the ultimate policy decisions on matters relating to SWM and PSP. Due to its nature, OYOWMA is the operative authority responsible for the management of solid waste in the city. It is responsible for waste collection, private operator registration and supervision, transportation of waste to dumpsites, dumpsite management, and implementation of policy. It is led by a general director reporting to the authority's chairman.

2.1.7.4 The Oyo State Ministry of Environment and Habitat

The Ministry of Environment and Habitat (MEH) in Oyo State in 2011 was established at the state level by the Ministry of Environment and Habitat Act and is charged with the duty of environmental protection, maintenance and enhancement among others. The functions of the Ministry of Environment and Habitat also entail the adoption and measures to ensure effective structures for the promotion of the protection of the environment in Oyo State for the control of floods by dredging, solid and bulk waste collection as well as waste disposal, the elimination of water as well as air contamination, and control of noise as well as sanitation in general[104].

Department of Environment and Habitat also has responsibility for sensitization on waste disposal and other pollution related issues in Ibadan and the entire Oyo State. They supervise the mandatory weekly as well as monthly environmental sanitation and cleanup exercises, part of which is to assess the condition of waste management in within the Local Government Areas. Citizens are expected to participate in the cleaning of their direct environment throughout the course of the environmental sanitation exercises. The task of the Ministry of Environment and Habitat is to make everybody take part in the exercise, as well as penalties for individuals who do not provide cooperation throughout the exercise[105].

2.1.7.5 The Local Governments

The task of each local government includes participating in the planning and economic growth of its locality. Tasks of local governments encompass levying and collecting taxes as well as maintaining and providing sanitation services.

A couple of years however, Oyo State local governments had no resources to manage refuse disposal services within their areas effectively. As a result, the burden of providing services was passed on to Oyo State Waste Management Agency (OYOWMA) while the local governments transferred their respective waste management sites to OYOWMA. Roles were reversed in October 2015 resulting in OYOWMA transferring the management of waste collection vehicles back to the local governments. Currently (at the time of writing this report), the local governments are providing waste collection services in their jurisdictions[106].

Oyo State Waste Management Agency had been partially funded by the local government councils in Ibadan in exchange for waste services rendered. In addition, the following are the functions of the local government administrations:

i. Issuing adequate legal documents as well as instituting the sanctioning and implementation procedures necessary to provide efficient delivery of services
ii. ii Hiring, retraining, and educating staff to provide service efficiency
iii. iii Setting up a consultative platform involving the general community to develop a common consensus on suitable strategies for waste management
iv. iv Development of informative, educative, as well as communicative resources regarding the techniques used to manage solid waste at the household level

v. Promotion of participation of the private sector in the provision of waste management options.

2.1.8 The Concept of Sustainable Development

Since its inception, the notion of sustainable development has gone through several stages of development. Various groups were involved in the concept's historical development, and they are presently working hard to put it into practice. While the concept has been recognized in several fields of human activity, it has received various criticisms and interpretations over time, and the definition of sustainable development has become one of the most quoted definitions in the literature[107].

In its most basic form, sustainable development is a philosophy that attempts to meet human development goals while also conserving natural systems' capacity to access the natural resources, ecosystem services, and other benefits on which the economy and society are reliant. Sustainable Development can be described as development that fulfills the requirements of the present without risking the ability of the future generations to achieve their own demand in the future. There was a report called the Brundtland Report that came out in 1987. This report came up with the official definition of "sustainable development." Sustainable development is a way to make sure that society can last for a long time. This entails understanding both the needs of the present as well as those of future, such as protecting the environment and natural resources or making sure that everyone has a fair chance at a good job and a good life.

The concept of sustainable development is grounded in the concept of development (socioeconomic development in line with social constraint), concept of needs (redistribution of resources to ensure the quality of life of all) and future generation (the possibility of long-term usage to ensure the necessary quality of life for future generation)[108].

Sustainable development is the conservation of natural resources and a sense of obligation to future generations[9]. It is also the means of looking after resources while maintaining present and existing activities[10]. Sustainable development concept is defined as the development that meets the needs of the present without compromising the ability of the future generations to meet their own needs, it can therefore be inferred that the ability to meet the compulsions of equity within generations of humans and also of inter-generational equity is sustainable equity. It is the development that meets the needs of future and present generations. The Brundtland Report describes sustainable development as an idea that reaches beyond environmental protection, as it means a process of change in which exploitation of resources, direction of investments, orientation of technological development and institutional changes are made consistent with future as well as present needs. Sustainability development makes for a "balance between economic development—all the changes in the economy development both quantitative and qualitative and the ecological sustainability—both the quantitative and qualitative environmental strategies that improves the ecosystem and welfare"

The Brundtland Commission on Sustainable development is the most used definition of sustainable development as it does not limit the scope of sustainability, however, it does not make provision for the importance of intergenerational equities. The key principle of sustainable development is that it integrates economic, social and environmental concerns into the aspects of decision making, the overall goal of sustainable development is the long-term stability of the economy and environment which is only achievable through the integration of the economic, environmental and social concerns throughout the decision-making process. Another principle of sustainable development is the principle of conserving resources for future generations, this

principle sets sustainable development apart from the traditional environmental policies that seeks to internalize the externalities of environmental degradation.

United Nations Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted in 2022 as a universal call to action for ending poverty, protecting the environment, and ensuring that all people live in peace and prosperity by 2030. The 17 Sustainable Development Goals (SDGs) are interconnected; they understand that actions taken in one area will have consequences in another, and that advancement must strike a balance between social, economic, as well as environmental protection. A number of countries have pledged to prioritizing advancement for people who are the most behind in their development. The Sustainable Development Goals (SDGs) are intended to put an end to hunger, starvation, AIDS, and inequality against females. To attain the Sustainable Development Goals in every setting, it is vital to draw on the creativity, knowledge, technology, as well as financial capacity of the entire society[109].

Sustainable development can be thought of in many different ways, but at its core, it is an approach to development that tries to find a balance between different and sometimes conflicting needs while also remembering that we all have an obligation to care, improve social well-being, and make sure that the economy is stable. Progress is often driven by a single need, rather than looking at the bigger or longer-term effects of that need, which can be hard to do. Because of irresponsible banking and fossil-fuel-based energy sources, we are already seeing the effects of this strategy on a world-wide scale. The more we go on with unsustainable development, the more likely its consequences will become more common and severe, requiring us to act quickly.

Sustainable development refers to economic planning in this manner. It aims to protect the environment for future generations while also expanding the economy. Sustainability has grown in popularity over time. It proved difficult to apply, however, because the conclusions of long-term sustainability evaluations are dependent on whatever resources are examined. It may be difficult for native birds to live in a region with a lot of forest, yet a mineral deposit that will eventually run out may nevertheless be able to support more or less stable people. Following the 2019 Earth Summit, many environmental research focused on how to keep things safe and healthy[110].

The three major goals of sustainable development are to improve the planet.

Economy: Ensuring that there is enough land of the correct type and in the right places at the right time to sustain development and innovation; and finding out, and then cooperating to plan and build new things.

People that labor to safeguard the environment help to promote biodiversity, properly use resources, decrease waste and pollution, adapt to and help stop climate change, and seek to make the world a more ecologically friendly place.

When we think about social inclusion, we think about ensuring that there is enough housing to meet the needs of both current and future generations, as well as ensuring that there are high quality developments with accessible local services that reflect what the community needs and contribute to a good health, social, and cultural life[111].

17 Sustainable Development Goals (SDGs)

1. Put an end to poverty in all of its manifestations everywhere.

2. Put an end to hunger, ensure food security, increase nutrition, and promote sustainable agriculture.
3. Ensure healthy lifestyles and promote well-being for all ages.
4. Ensure inclusive and equitable quality education for everyone, as well as opportunities for lifelong learning for all.
5. Achieve gender equality and empower all women and girls.
6. Ensure the availability and long-term management of water and sanitation for everyone.
7. Ensure universal access to affordable, dependable, sustainable, and modern energy.
8. Promote long-term, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.
9. Invest in robust infrastructure, promote inclusive and sustainable industrialization, and encourage innovation.
10. Reduce intra- and inter-country inequalities.
11. Make cities and human settlements more inclusive, safe, resilient, and long-lasting.
12. Ensure long-term consumption and production patterns.
13. Take immediate action to address climate change and its consequences (noting agreements made by the UNFCCC forum).
14. Conserve and utilize oceans, seas, and marine resources in a sustainable manner for long term development.
15. Protect, restore, and promote the sustainable use of terrestrial ecosystems; manage forests sustainably; battle desertification; and prevent and reverse land degradation and biodiversity loss.

16. Promote peaceful and inclusive societies for long-term development, ensure equal access to justice, and construct Institutions that are successful, accountable, and inclusive at all levels.
17. Strengthen and revive the global partnership for sustainable development's implementation mechanisms.

2.1.9 Structural Elements of Sustainable Growth

This worldview stresses a positive change direction dependent on issues like social, financial, and ecological angles. Maintainability is characterized by three elements: monetary development and social uniformity, as per an educator. The thought of SD depends on three calculated columns, as per this contention. Among these are monetary, social, and natural maintainability.

Economic Maintainability

Financial maintainability suggests an arrangement of creation that fulfills present utilization levels without compromising future necessities. Traditionally, economists assuming that the supply of natural resources was unlimited, placed undue emphasis on the capacity of the market to allocate resources efficiently. They also believed that economic growth would be accompanied by the technological advancement to replenish natural resources destroyed in the production process. However, it has been realised that natural resources are not infinite; besides not all of them can be replenished or are renewable. The growing scale of the economic system has overstretched the natural resource base, prompting a rethink of the traditional economic postulations. As indicated by an analyst there are directing structures by which exchanges are assessed and choices about monetary exercises are made. Three primary exercises that are completed in an economy are creation, appropriation and utilization however the bookkeeping

system used to direct and assess the economy as to these exercises horribly misshapes qualities and this doesn't foreshadow well for society and the climate. A prominent researcher likewise reverberation that human existence on earth is upheld and kept up with by using the restricted regular assets found on the earth. Moreover, the fundamental concern is by all accounts on monetary development, significant expense segments like the effect of exhaustion and pollution, for instance, are disregarded while expanding interest for labor and products keeps on driving business sectors and encroach damaging impacts of the climate. Monetary manageability, hence, necessitates that choices are made in the most fair and monetarily solid manner conceivable, while thinking about different parts of sustainability[112].

Social Sustainability

Social manageability includes thoughts of value, strengthening, openness, support, social personality and institutional steadiness. The concept implies that people matter since development is about people. Basically, social sustainability connotes a system of social organization that alleviates poverty. However, in a more fundamental sense, "social sustainability" relates to the nexus between social conditions such as poverty and environmental destruction. In this regard, the theory of social sustainability' posits that the alleviation of poverty should neither entail unwarranted environmental destruction nor economic instability. It should aim to alleviate poverty within the existing environmental and economic resource base of the society.

Supportability, according to a researcher, entails encouraging individuals, networks, and communities to develop themselves in order to achieve meaningful goals in life, utilizing genuine medical services, and training in sexual orientation equity, harmony, and soundness around the globe[113]. Social sustainability is also said to be very easy to achieve, despite the fact

that social assessment looks to be confusing and overwhelming. While streams and cycles are easily observable in natural and financial frameworks, the elements inside the social framework are extremely enigmatic and cannot be easily proved. Achievement within the social framework means that individuals are not exposed to situations that undermine their capacity solve their difficulties[114].

Scholars say social sustainability doesn't mean meeting everyone's needs. Instead, it strives to provide the circumstances for everyone to be able to meet their own needs, if they so desire. A barrier is anything that prevents people, organizations, or communities from achieving social sustainability. From a systems viewpoint, it is crucial to understand social processes and how these structures evolve. Especially, in views of some notable authors, social sustainability also encompasses many issues such as human rights, gender equity and equality, public participation and rule of law all of which promote peace and social stability for sustainable development[115].

Environmental Sustainability

A shared environment and its ability to support human life is the focus of ecological sustainability. In terms of ecological manageability, it refers to the integrity of biological systems and the communication of the limits of native habitat. It requires the sustainable use of natural capital as a source of economic inputs and sink for waste. It means that the rate of use of natural resources should not exceed them. Regeneration at an achievable rate and the rate of waste discharge should not exceed the rate at which the environment absorbs the waste. The implication is that natural resources must be harvested no faster than they can be regenerated while waste must be emitted no faster than they can be assimilated by the environment. This is on the grounds that the earth frameworks have cut off points or limits to maintain balance[116].

In any case, the excursion for unbridled improvement is constraining perpetually essential solicitations on the earth system and putting always conspicuous strain on these cutoff focuses in light of the fact that inventive movement may disregard to help amazing turn of events. Verification to help stresses over the acceptability of the environment is extending. The effects of natural change, for instance, give a convincing dispute to the necessity for biological sensibility. Ecological change implies basic and suffering changes in the climate structure achieved by ordinary climate capriciousness or by human activities. These movements join warming of the climate and oceans, reducing ice levels, rising sea level, extending maturation of the oceans and growing combinations of ozone draining substances[117].

Changes in the climate have been displayed to essentially affect biodiversity. One examination showed, specifically, what expanded temperature means for animal and plant species propagation, relocation examples, and populace sizes. Regardless of whether pundits' assumptions are high, the whole effect of an unnatural climate change is obscure, as indicated by an investigation. What is obviously prudent, for sustainability, all social orders should acclimate to the arising real factors concerning overseeing biological systems and regular cut off points to growth[118].

Biodiversity loss is now occurring at a faster rate than usual. According to scientists, global biomes will expand and contract with climate change, as species expand their ranges and heights, as well as global plant cover. Species' chances of surviving will be reduced if they can't adapt to new geological distributions. Approximately 20 percent of coastal wetlands might disappear by 2080 due to rising sea levels. In view of the fact that they provide ideas for how the normal environment remains profitably stable, they are major ecological sustainability concerns[119].

2.1.10 Historical Background of Sustainable Development (SD)

Determination Disorder (SD) as a concept may be well-known, but its history and evolution will be mostly overlooked and downplayed. Despite the fact that the progress may seem little to some, it might help predict future trends and flaws and, therefore, provide essential assistance now and in the future. It has been noted that the notion of SD actually derives from financial issues in terms of a discipline. The dialogue concerning whether or not the capability of the Earth's constrained herbal assets could be capable of constantly guide the lifestyles of the growing human populace received conspicuousness with the Malthusian populace hypothesis in the mid 1800s[120].

As early as 1789, Malthus assumed that population was growing exponentially and that livelihoods could only grow in arithmetic progression. Therefore, if no steps are taken to curb population. With rapid growth, natural resources will be depleted or depleted, causing suffering to humans. However, the importance of this assumption lies in the belief that technology can be developed to eliminate this situation. Some organic assets are non-renewable, and ecological contamination and corruption will jeopardize output and long-term economic growth debate. This rekindled interest in the likelihood of Malthus' thesis coming true, and raised questions about whether the growth path being discussed was viable[121].

Similarly, analyzing whether or not the paradigm of worldwide financial improvement became "sustainable", the usage of facts on boom of population, business manufacturing and pollutants. Meadows concluded that "because the global is bodily finite, exponential boom of those 3 key variables might in the end attain the limit"[131]. It was no longer officially stated, but the worldwide network agreed on the concept that each improvement and the environment, formerly treated as distinct concerns, may be handled in a collectively beneficial way[122].

These occurrences prompted Gro Harlem Brundtland's World Commission on Climate and Improvement to renew the demand for sustainable development (SD), bringing full circle the Brundtland Report titled "Our Normal Future" in 1987. As of now referenced, the report characterized SD as improvement that addresses the issues of current age without compromising the capacity of group of people yet to come to addresses their own issues. Key to the Brundtland Commission Report were two central points of contention: the idea of requirements, specifically the fundamental necessities of the world's poor (to which superseding need ought to be given); and the possibility of impediments forced by the condition of innovation and social association on the climate's capacity to meet present and future necessities[123].

A scholarly recommended that the Brundtland report brought forth the Assembled Countries Gathering on Climate and Advancement (UNCED), the 1992 Rio Earth Summit 132. The report's proposals were the primary subject of the UNCED banter. The UNCED explained a few critical accomplishments of supportable advancement in the gathering result record (i.e Plan 21). It pronounced that feasible improvement ought to be a need issue on the global local area's plan, "and kept on suggesting the plan and definition of public techniques to address maintainable advancement issues. The economic, social and environmental aspects of sustainable development. In 2002, it was called Li Around +10 World Summit on Sustainable Development (WSSD) was held in Johannesburg to review the progress of sustainable development. Application of the results of the Rio Earth Summit. WSSD developed an implementation plan for the actions proposed in Agenda 21, the Johannesburg Plan, and initiated a series of multi-stakeholder partnerships to promote sustainable development[124]. In 2012, 20 years after the main Rio Earth Highest point, the Unified Countries Gathering on Economical Turn of events (UNCSD) or Rio+ 20 was held. The gathering zeroed in on two topics with regards to economical turn of events:

green economy and an institutional system. A reaffirmed obligation to SD was critical to the gathering result record," The Future We Need" so much that the expression "reasonable turn of events" seems multiple times inside the 49 pages. Results of Rio +20 incorporated a cycle for growing new SDGs, to produce results from 2015 and to empower zeroed in activity on SD in all areas of worldwide turn of events[125].

2.1.11 Basic Tenets of Sustainable Development (SD)

Accomplishing SD relies on various standards. Notwithstanding, the dominant message with respect to the standards of practical improvement, floats towards the economy, climate and society. In particular, they relate, among others, to protection of environment and biodiversity, creation frameworks, populace control, human asset the executives, preservation of reformist culture and individuals' investment.

A vital guideline of SD is ensuring the environment. It is important to ensure environments and biodiversity, on the grounds that without these, creatures would presently don't exist. The restricted means and assets on earth are adequately not to meet the endless requirements of individuals. The unnecessary abuse of assets will adversely affect the climate. Hence, for practical turn of events, the advancement of regular assets should be inside the conveying limit of the earth. This implies that advancement exercises should be done as per the limits of the earth. This is the reason example should, have elective energy sources, for example, sun oriented energy as opposed to depending vigorously on oil subsidiaries and hydropower[126].

In addition, to achieve sustainable development, there is a need for people control. However, due to human development, human needs such as food, clothing and additional space where goods

available in the world to meet these needs can often be expanded to meet basic needs. In line with these lines, human and management controls are essential to sustainable development.

Human resource management is another important command of sustainable development. It is the people who have to make sure that the ideas are followed and followed. It is the people who are responsible for using and conserving the environment. It is the people who should make sure that there is peace. This makes the humanitarian position within sustainable development wishing critical. It means that human data and the ability to worry about the environment, financial system and society want to improve. This may be completed essentially via schooling and education in addition to right healthcare offerings considering the fact that a valid thought is living in a valid body. These factors can also help in growing wonderful mindset in the direction of nature. Education also can have an effect on society in the direction of retaining the surroundings and appreciating human values in addition to suited manufacturing techniques`.

It is similarly battled that, the course of sustainable development ought to be participatory to be productive and down to earth. The dispute, which implies the systems speculation, is initiated on the possibility that sustainable development can't happen through the undertakings of simply a solitary individual or institution. It is an aggregate liability which requires the cooperation, all things considered, and pertinent substances. Sustainable development is based on the rule of support, which requires uplifting outlooks of individuals in order for visible advancement to be accomplished with liability and reasoning for soundness[127].

Reformist customary and political culture should be created and kept up with or maintained and based upon to hold the general public together as well as help to esteem and preserve the climate for sustainable development. Pretty much, the essential summative norm of sustainable

development is the conscious mix of regular, social, and monetary concerns into all pieces of dynamic across ages. The SDGs reflect a reasonable arrangement of monetary, social and regular destinations and targets. In achieving the SDGs, countries ought to see and like the presence of possible trade-offs and devise ways to deal with them. They also need to see the potential for further development.

2.1.12 Employee Development and Training

An organization is just as efficient as individuals operating in it. It is a truth that the stipulation of effective solutions by any kind of company relies on the top quality of its labor force. Therefore, staff training and development refers to the procedures and methods that aim to offer learning steps to increase the skills, understanding, and capacities of individuals, groups, and companies so there is no shift in action to accomplish the targeted outcomes. If it is to keep an educated as well as competent workers, staff member training and also advancement is not just preferable yet, it is a task which monitoring need to devote human as well as financial sources[128].

Employee training and development is a procedure of changing staff member's practices to additional business objectives. Training is herein referring to as any kind of understanding task which is routed in the direction of the procurement of particular expertise and also abilities for the functions of a profession or job. The emphasis of training is the work or job. Development on the other hand, is any kind of learning task which is guided in the direction of future demands instead of existing requirements and also which is worried a lot more with job development and also prompt efficiency. The emphasis of development has a tendency to be largely on an organization's future workforce demands, and also second of all, on the development requirements of people in the work environment[129].

The accumulation of information and abilities that may be applied now or in the future is referred to as development. It must be emphasized that the word development is more of a long-term strategy. It is a broad phrase that refers to a variety of approaches to encouraging individuals to improve, upgrade, and adapt their understanding, talents, abilities, and competences. Development as explained, has a greater emphasis, a longer time span, and a bigger reach.

The training plan of an organization might consist of a series of plans on managing personnel. The plan declaration lays out what the organization is prepared to do in regards to establishing its workers as well as it should sustain the business objective, methods and approach. The policy declaration has to be specified in clear terms and also should likewise be readily available to all for recommendations. Some organizations have a custom of expanding their very own supervisors as well as expert by giving a considerable internal training to maintain all their requirements[130].

Various organizations or companies contract their training to outside suppliers such as universities, colleges, professionals and also personal training organizations. There are, nonetheless, various other organizations that take on a midway placement, giving induction training as well as work training inside yet contracting out management as well as supervisor training.

2.1.12.1 Concept of Employee Training

So many authors have defined training in a different of ways. Some defined it as a systematic acquisition and development of the knowledge, skills, and attitudes required by employees to adequately perform a task or job or to improve performance in the job environment". Put differently, training generally refers to teaching employees how to execute his or her existing

duties as well as assisting employees in acquiring the information and capabilities necessary to be great performers. Other scholars view training as, "a planned process to modify attitude, knowledge, or skill behaviour through learning experience to achieve effective performance in any activity or range of activities"[131]. Its goal is to help individuals improve their talents while also meeting the organization's current and prospective demands.

The above definitions did not rule out the vibrant and also transforming nature of the setting in which organisations run. It likewise suggests that training immediately equate to organisational efficiency. Abilities required by staff members are continually transforming; besides, the ever-changing enhancement on details as well as modern technology makes expertise and also abilities outdated in an instant. This indicates that workers ought to align their demands to that of the organisations needs as well as their very own long-lasting development and the Human Resources Department must think about the future and also present requirements of the organisation when preparing for staff training[132].

Despite their differing perspectives, all experts appear to agree on one thing: training strives to organizational productivity. Training and development has been a subject of many studies over the years. A survey of 100 sample was conducted, the study observed that there is a positive relationship between training design and organisational performance. Similarly, in some other studies carried out in Pakistan, it was observed that there is a positive correlation between employees' training and organisational competitive advantage. On the other hand, another study pointed out that only off-the job (general) training improves organisational performance, whereas on the job training does not[133].

Training and development have actually been recognized to be extremely crucial elements of organisational performance. It is not an end objective, instead, training is qualified as a

way to an end, that is, the end being effective, reliable work organisations, occupied by educated employees that see themselves as considerable stakeholders in their organisations' success. However, less than 5% of all training programs are analysed in regards to their monetary advantages to the organisation. Relevance of training has actually been recorded for variables besides organisational performance. Several of these added end results are relevant to performance indirectly. Development and training are primarily routed at staff member, yet its supreme effect is likely felt by the organisation. When it combined with each other with the human source management techniques training will certainly have the best influence[134].

Several researches have actually amassed assistance for the advantages of training for organisations as a whole. These advantages consist of improved organisational efficiency, for example, efficiency, performance, running income per staff member in addition to various other end results that associate straight, for example, decreased prices, improved high quality, as well as amount or indirectly, for example, worker turn over, organisation's credibility, social resources to efficiency.

It is worth noting that information systems, staff development, and reward schemes all revealed a substantial and substantial link to organizational success. This might be related to the fact that employees in most developing nations are not compensated as well as those in developed countries, therefore workers are more concerned with human resource procedures that could help them earn more money. Several interventions are effective at increasing the benefits of training to the organization[135].

First, organisations should conduct a needs assessment using experienced subject matter experts to make sure trainees are ready and motivated for training. Second, in terms of design, organisations should apply theory-based learning principles such as encouraging trainees to organise the training content, making sure trainees expend effort in the acquisition of new skills, and providing trainees with an opportunity to make errors together with explicit instructions to encourage them to learn from these errors enhances the benefits of training.

Third, in terms of training delivery, the benefits of using technology for training delivery can be enhanced by providing trainees with adaptive guidance. The model of gauging training efficiency established by Donald Kirkpatrick in the late 1950s can improve the viewed advantages of training from the point of view of different stakeholders at the same time, consisting of those that take part in training, as well as those that fund it, which is the organisations. Numerous studies pinpoint the ecological variables such as managerial assistance as well as chance to perform as mediators of the relationship in between training as well as transfer of training back to the job environment[136].

There are two main theoretical approaches towards employee training and development, they are, the human capital approach and the technology-based approach. The human capital approach regards training as investment in human capital. Thus, training is provided only when the benefit from productivity gains is greater than the cost of training[65]. Also, the world economic forum focused on prioritizing training and mentoring**.** More than half of high performing companies say they offer supplemental training programs as an employee benefit. In fact, high- performing companies were nearly ten (10) percent more likely to have a mentoring program as compared to underperformers.

Additionally, high-growth companies are sixteen (16) percent more likely to have a formal mentoring program than underperforming companies. Training programs are important because the new generation of workers expects these initiatives to be in place in order for them to grow and succeed. The survey found that millennials rated development as a bigger priority than compensation in the United States. This is a big factor in attracting the next generation of talent. Plus, as baby boomers exit the workforce, there will be a strong need for new leaders to replace them. Organisations should start developing leaders through training programs and developmental job assignments in order to be ready for the future.

On the other side, the technology-based strategy view training as an ability for development procedure. For this approach, the increased training in the modern period is driven by the swiftly transforming modern technologies and also job reorganisation. Therefore, training is given due to the fact that it pleases the useful demands of an organisation and also similarly adds to human resources build-up or skill development. These techniques nevertheless, overlooked the content of worker training, which might be a resultant impact of training layout as well as training distribution design.

It is believed that the complication regarding staff training can be found in the following four ways. For starters, it has nothing to do with the technical components of certain work responsibilities. Moreover, given the fact that many instruction manuals recommend it, previous need evaluation for these training is rarely done. Third, organizations and instructors seldom evaluate the behavior or result improvements that arise as a result of such training. Whenever there is an evaluation, it is frequently about whether one feels

about the training or how one has learnt. The assessment form is known as a "smile sheet" since trainees frequently answer positively to the questions. However, the training's impact is unknown. Fourth, despite the lack of empirical proof of a relationship between personal training courses and improved corporate bottom lines, personal development training has grown rapidly[137].

Training presents a prime opportunity to expand the knowledge base of all employees, but many employers in the current climate find development opportunities expensive. Employees attending training sessions also miss out on work time which may delay the completion of projects. However, despite these potential drawbacks, training and development provides both the individual and organisations as a whole with benefits that make the cost and time a worthwhile investment. The return on investment from training and development of employees is really a no brainer. Human Resource professionals also believe that an organisation is only as good as its employees, and this understanding suggests that training should be more specifically responsive to employees" training needs. Effective company leaders acknowledge that their one-upmanship in today's market place is the people[138]. They additionally recognize that couple of organisations understand exactly how to handle personnel efficiently, mainly due to the fact that standard monitoring designs are unacceptable in today's vibrant workplace.

To handle an organisation, both little as well as huge calls for staffing them with qualified workers. The education system in Nigeria does not effectively teach work abilities for a placement in a specific organisation as well as couple of workers have the requisite understanding, proficiencies, abilities, and also capabilities required to function. Consequently, several staff members call for comprehensive training on duty to get the

needed expertise, abilities, capacities, and also proficiencies required to make substantive payment in the direction of the organisation's development.

The performance and also success of an organisation rests on individuals that function and also work within the organisation. It adheres to for the reason that for the staff members in an organisation to be able to execute their obligations and also make significant payments to the success of the organisational objectives, they require to obtain the pertinent abilities as well as knowledge[139]. In the admiration of this reality, it is essential for organisations to determine the training and also development requirements of its workers, with its training requirement evaluation as well as straighten such requirements to the organisational requirements and also purposes in order to actualise the organisational vision and mission.

Hence training encourages employee as well as make them extra efficient and innovative. Well-trained workers are more capable and eager to exercise greater authority over their employment; they require less oversight, allowing organizations to focus on some other activities; because staff are better qualified to answer client queries, rising consumer loyalty. Staff understand their jobs are also less quick to argue, are far happier, and driven, which improves managerial interactions. Among the most essential components in employees' motivation is the ability to continue to develop via training and development[140].

2.1.12.2 The Advantages of Training and Development

Employee training and development is among one of the most considerable incentives utilized to aid both people as well as companies in attaining their temporary objectives and long-term goals. It must be noted that, training and objective not just enhance understanding, abilities, and also mindsets, yet it likewise provides a number of various

other advantages. Some of the common advantage of employee training and development are:

- It boosts workers' spirits, self-confidence, as well as inspirations.
- Since people are able to lower waste, it decreases manufacturing prices.
- It promotes a complacency which consequently minimizes turn over and absenteeism.
- It enhances employee's participation in the modification procedure by supplying the expertise required to adapt to difficult as well as brand-new circumstances.
- It unlocks acknowledgment, greater pay, and also promotion.
- It assists the company in boosting the accessibility as well as high quality of its personnel. It is significant to bear in mind that people end up being much more effective due to the fact that training and development programs enhance people' capabilities and also abilities. Also, companies supply tuition compensation for people to participate in such programs[141].

Furthermore, training and development programs provides numerous advantages to company's people and companies, they are:

Individual Benefits: Training and development programs aid people in discovering the soft, functional, as well as technological abilities essential to execute their tasks. They accomplish greater degree of work contentment, due to the fact that they feel they are

investing their very own future. They really feel that their duty within the company has a genuine function.

Considering that the people' commitment often tends to increase considerably, they spend even more of their effort and time in attaining the bottom line for the company. People have a tendency to proactively look for possibilities to obtain cutting-edge abilities, to experience varied functions and also obligations, as well as to search for added individual and also professional development. Such propensities increase their work, self-worth, as well as self-confidence satisfaction. Training and development increase the general efficiency of people.

Organizational Benefits: Training and development programs aid companies in remaining affordable and competitive in their various industry. The American Society for Training and Development (now known as the Association for Talent Development) identified a link between financing for employee training and development activities and higher earnings from the stock market. Organizations that spend approximately $1,575 per employee on learning, obtained 24% development in gross revenue and also 218% rise in income per worker. Consequently, development as well as training programs assist companies in maintaining their ability, distinguishing themselves against various other companies, enhancing their appearance as the best company in the work market, as well as raising the total business performance.

Every company is accountable for enhancing workers' efficiency by carrying out efficient as well as pertinent training and development programs. Given that employee are one of the most crucial possessions of a company, it is critical to maintain such a concept. Company has to enhance the payment of its workers by guaranteeing an ideal resource of

personnel that is functionally, practically, as well as socially with the ability of becoming specialized or supervisory duties. Generally, companies that proactively carry out employee training and development programs obtain favorable outcome from the people that make use of the programs[142].

2.1.12.3 The Purpose of Training and Development

Training and development take place at various level of the company and also aids people in obtaining varied objectives. This initiative helps people in lowering their stress and anxiety or aggravation encountered in the office. When a job is not effectively executed and also completion outcomes are not viewed as anticipated, the person might not really feel determined to maintain performance[143]. People that are unable to perform at the anticipated level of efficiency might also choose to leave the company, since they feel they are not efficient and also come to be disappointed with their task. Therefore, employee training and development acts as the device that not just increase the proficiencies required for employee performance, however it additionally gives the ways to help people in feeling a lot more pleased with the outcomes of their performance.

Increase competencies cause much better efficiency as well as retention. Worker training and development is a crucial element of Human Resources preparation tasks, since it not just takes full advantage of the returns of people, however it might additionally bring in much better ability to the company. Adequately, it establishes the assuming capacities and also imagination of people for far better choice production, customer support, issues dealing with, and also general self-efficacy[144]. On top of that, employee training and

development offers the abilities when people relocate from one job to one more of a various nature. In any levels of the company, it is vital to provide high-quality work.

Employee training and development ought to be made use to orient people and also to boost their functional and also supervisory abilities. By supplying core effectiveness as well as framework throughout the worker training and development procedure, it raises the possibility for people to successfully provide the objective, while sustaining others in producing a discovering society as component of the company's calculated objectives. When companies give the sources needed to do a task, people come to be completely satisfied with their tasks as well as even more efficient, while the company comes to be a lot more effective[145].

2.1.12.4 Effect of Training on Employee Performance

Training delivery style is a very important part of training. Employees are very conscious about the delivery style. Thus, if someone is not delivering the training in an impressive style and not capturing the attention of the audience, it means the trainer is wasting the time. Therefore, it becomes imperative for a trainer to engage its audience during the training session. Delivery style means so much in the training because it is what goes into making the change expected in the trainee.

The Human Resource Department must ensure that no matter the type of method used, must be able to catch the trainee's interests. Once training has been designed, then the actual delivery of training can begin. The general recommendation is that training be pilot-tested or conducted on a trial basis in order to ensure that the training meets the needs identified and that the design is appropriate[146].

2.1.12.5 The Concept of Training and Development

Among the most significant aspects of human management in organizations or institutions is training and development. Workers in the organization can improve their understanding, talents, and abilities via training and development, allowing them to accomplish their tasks more efficiently and effectively. Furthermore, training and development serve as a source of inspiration for employees. Training is defined "as a set of activities which react to present needs and is focused on the instructor and contrast with learning as a process that focuses on developing individual and organisational potential and building capabilities for the future". Training is essentially a management tool derived to foster, develop, and increase skills and knowledge base of employees and also employers with a view to ultimately increasing both the employees and organisations performance in terms of efficiency, effectiveness, and overall productivity[147].

Training and development describe the initiatives made by a company to give learning opportunities to workers in the company. Training and development must comply with this goal. The first is to instil recognition awareness among employees. Secondly, to increase the abilities of an employee several areas of expertise. Thirdly, to raise the inspiration of an employee order to perform its job in a better way. A company's training and development efforts are designed to equip its staff with the information and skills necessary to improve their expertise, competence, and attitude in the short and long term.

Training is all the initiatives made by the company to increase the capacity of an individual to perform his obligations or contribute that has been established by the company. Training can likewise be stated to be a preparation task of a company to boost the understanding

and also social practices of its staff members to be in accordance with the objectives of the company. Such tasks vary from easy physical abilities to the development as well as adjustment of intricate attitudes. However, the following features explain the concept of training. First, training is a learning procedure that has a detailed content. Secondly, its objectives are work-oriented as well as prompt. Thirdly, its period of its short but prolonged. Fourthly, the technique of its application either formal or informal. Fifthly, the objective of training is for the self-development of employees either from a mental or cognitive element[148].

Training is described as a systematic and organized activity by an organization which tries to give its personnel with the skills, knowledge, and capacities they need to effectively fulfil their tasks and responsibilities in order to accomplish organizational goals. Employees' skills relate to the abilities they must possess in order to complete their given responsibilities efficiently and successfully. Employee's capacity to perform the physical or mental activities necessary in a work is defined as having a fundamental comprehension of ideas or principles linked to a particular field of study.

Development is a more advanced tool which essentially allows the employees to progress along a career plan and path with the skills and knowledge gained over time. It allows employees progress according to the needs of the organisation. Training and development go hand in hand and are vital in the pursuit of organisational effectiveness, efficiency, and overall productivity and performance in actualising set goals and targets[149].

2.1.12.6 Identification of Training Needs in an Organisation

The prominent claim that ‘a problem identified is half resolved' recommends the demand to identify the various means of identifying the needs for employee in an organisation. A complete analysis of what is already being trained, as well as what expertise, talent, and competences must be provided now and, in the future, is the basis of an entire organizational training needs assessment. Assessment methods training requirements may be determined in a variety of ways, depending on the situation:

- A seen or felt need: This is a general need for enhancement in a particular discipline.
- Relative requirements: These are demands that are determined by contrasting the training target market to a collection of requirements.
- Reaction to a failing of some kind. This can be as an outcome of the organisation's failure to satisfy a collection objective for a certain duration.
- Important Incident demands: This demand might take place due to a devastating failing such as a manufacturing facility surge.
- The last demands: This is an awaited requirement that will certainly happen based upon organisational adjustments, such as brand-new items, brand-new solutions and so on. There ends up being a demand to re-train if present training is not satisfying its purpose.
- When there is a void in the work. When efficiency is listed below spec or requirement, this happens- Training Needs Assessment

Educating demands evaluation techniques vary from one organisation to another. Relying on the objectives, the timeline for the spending plan, treatment, and also

staffing, yet one of the most usual requirements evaluation devices is a study (created or on the internet). Work evaluation is one more technique of recognizing training demands and also this pertains to the contrast of task being done with work summaries or supervisor's summary, and even anticipated result[150]. Various other devices are enumerated below:

- Competency recognition; as well as Operational dimensions.
- Benefits of Training Needs Assessment

The following were recognized as the significance of training requires analysis to organisations:

1. It checks out methods which the proficiency, capacity and also possibility of organisation can be enhanced
2. It makes it possible for organisations acquire much better out results with maximum exercise of sources
3. It develops significance of training for staff members as information gotten from the analysis discloses training demands
4. It aligns with organisational objectives and training
5. It gets criteria that require to be complied with for excellent expertise degrees. It aids to deal with locations in which workers require abilities growth and also
6. It recognizes the listing of abilities or expertise that workers require in order to attain organisational objectives.

2.1.12.6 Individual Advantage of Training and Development

Employee obtain a great deal of take advantage of the worker training and development program. They discover the technological and also soft abilities needed by their work. In last 10 years joblessness goes to its highest possible prices which is not valuable for the employees to begin a new work, if possibilities for development are less. Employee development program assist staff members to make it through in the future and also establish their capabilities to handle brand-new modern technologies. From several years the demands for blue-collar job is consistent, as well as countless business have actually prepared an adjustment for requiring finding out software application as well as configured systems. This need is engaging employees to evaluate their occupation abilities to maintain their work. As a result of this scenario, countless workers have actually restored their mindset to get promotion inside their companies to create and also function out of the company[151].

Employees utilized to prepare 10year strategy for their future as well as regularly alter their strategies after two years as per the modification of innovation and also information. Tires Plus supplies training to advertise a varied profession via the company which makes up 80 hours training for manager to advertise them to the supervisor. I-Cube, Information modern technology seeking advice from company give employee development program for their staff members which is called by I-Altitude and also deal to fresh staff members to ensure that they can conveniently readjust themselves in the company. Workers comprehend that training program can routed to remarkable obligations and also greater pay. Aiding employees to enhance their abilities and also understanding to deal with the future demands, lead to work contentment[152].

2.1.12.7 Organizational Performance and Training Design

It is critical for the organization to plan training with extreme caution. The training must be designed to meet the needs of the employees. Some organizations that build a good training plan based on the needs of both the workers and the company consistently get positive outcomes. Excellent training strategy takes into account educational ideas, legal concerns, and various teaching approaches[153]. Training design has a significant impact on employee and organizational performance. A poor training design results in a waste of time and resources.

When developing training, there are three key factors to consider. They are

1. Establishing student's preparedness,
2. Recognizing various understanding designs, and also
3. Developing training for transfer.

For training to be qualified as well as effective of affecting organisational efficiency, the students have to have the fundamental abilities essential for discovering, the inspiration to have as well as discover self-efficacy. Considering that the purpose of training is to aid students obtain the practices needed for reliable job efficiency, it is consequently critical that a clear understanding of the methods which knowing concepts are used when creating training programs are discussed. The more strongly driven an employee is, the faster and more completely he or she will gaining a new technique or knowledge.

If people recognize the need for training and commit to it, they will learn. For example, if their desire is low and they question their capacity to learn, the efficacy of their training

will be restricted, regardless of how effectively it is designed and conducted. This means that training should be relevant to something that the student is interested in. The motivation might be a need that the trainee believes training would help him or her address. For instance, job advancement, recognition, and so on[154].

As a result of the training, the employee or the learner recognizes relevant information and correlates them with his or her own desired responses as a result of training. The third step is to respond. To allow the trainee to comprehend the reaction, training should indeed be swiftly followed by constructive feedback. There is still a good chance that even if feedback is still not timely, strong, and consistent, it will not generate the desired consequence. Some other key necessity is feedback. The feedback and suggestions that the associated with an improvement on the accuracy of his response. This should be made released as soon as feasible in order to guarantee the most successful learning feasible. However, these training fundamentals are sound, the author neglects to explain their applicability, wherein the trainee actively engages in adding the skills acquired, as well as the fact that participants' levels of proficiency and insight vary, which may influence training methods[155].

The way by which training concepts are delivered to participants or trainees is referred to as training techniques. The techniques and approaches employed in training determine its efficacy. Nevertheless, an organization's decision on which approach to use will be influenced by cost, time constraints, the number of personnel to be educated, the level of expertise necessary, and the trainee's background. The approach to be taken on depends upon whether the training is most likely to be used in the worker's existing setting, future or expected position. Considering that training is the emphasis, the Human resources

Department must take into consideration the appropriate and also most gratifying approaches.

Apprenticeship

Apprenticeship is a strategy for accelerating the development of organised competence professionals consisting of a set of abilities. Apprenticeships ranged from those seeking a craft or trade license to those seeking a professional license to perform in a regulated field. Apprenticeship training equips a person with the information and skills necessary to do a craft or a set of related tasks. The majority of the training takes place when the apprentices are employed by an employer who assists them in learning their trade or profession in exchange for their continued labour for a set length of time (usually 4-6 years) once they have demonstrated demonstrable competencies. During the apprenticeship, the company provides them with a stipend to cover their living expenses. On-the-job training and formal or classroom learning are sometimes combined in apprenticeship programs.

Initiation/Orientation

This form of training is provided to new employees to familiarize them well with organization's overall needs, such as values, morals, laws, and policies. This training focuses on orienting new workers to their new duties, frequently on their first day on the job.

Internship

This is a system of on-the-job training, however for expert and white-collar professions. Internship for professional careers resemble instructions for profession and also employment works. The significant distinction is that Internship is generally for university

or college student. Often, post-graduate grownups take place internship. Typically, internship functions as an exchange of solutions for experience in between the trainee and also his/her company. Trainees trade their complimentary or economical work to acquire experience in a certain area. If an individual has rate of interest in a certain occupation, internship can likewise be made use of to figure out. It is important to note that, an internship might be paid, overdue, or partly paid. Paid internship prevail in specialist areas. Non-profit and also nongovernmental organisations have unsettled internship.

Coaching and Understudy

Understudy is a kind of training where a staff member functions as a subservient companion with a manager to ensure that ultimately the staff will certainly think the complete duties and also tasks of the certain task. In other words, it is the act of studying another actor in order to replace in instance of an emergency situation. The existing or inbound worker must function straight with a senior supervisor or manager he or she is to change for weeks to guarantee appropriate training with the intent that the new worker will certainly end up being the new manager. It was said that for understudy to be reliable, training, need to be carried out as component of a supervisor's everyday job much prior to leaving a firm or retiring.

Job Rotation

This is a training method that designates trainee to numerous works as well as divisions over a duration of couple of years. This is a training method in which learners are assigned to numerous positions and departments over the course of several years. Job rotation is an efficient managerial strategic approach in which an employee is rotated through a series of jobs aimed to expose him or her to the full organization's activities. A well-structured work

rotation program at an organization has a significant opportunity for enhancing employee satisfaction, employee engagement, and retention. Leadership growth, job enrichment, efficient incentive to succeed generated by novel difficulties, and career development are some of the advantages.

Informal Training

Conversations and comments between staff provide informal training. Rather than formal training programs, individuals learn a lot of what they know about their employment through posing questions and gaining assistance from many other workers and supervisors.

E-Learning: On-line Training

E-learning is using the net or an organisational intranet to perform training online. As a growing number of staff members utilize computer systems and also have accessibility to internet sites, their companies try to find training chances online that will certainly be useful to the worker. Computer-supported simulations within organisational training can reproduce the behavioral as well as mental needs of a job, along with supplying some quantity of physical similarity to the student's job environment.

Vestibule Training

This is a system of training wherein a worker is sent out to a similar organisation in other places outside his workplace. The training area looks precisely like the worker's workplace. The distinction in between the training place and also worker's environment is that it focuses learning as opposed to manufacturing. The student exists just to obtain the preferred understanding or ability. Some financial institutions in Nigeria have this type of training center. The significance is to make sure that the trainee discovers the work

abilities without always imbibing some bad customs and practice of the workplace. An additional benefit of this technique is that expensive blunders/mistake are prevented and also purchase of expertise is improved given that the trainee experiences the same equipment and also devices.

Classroom Instruction Technique

This strategy is typically used to transfer information in a non-work setting such as training centres, schools, or professional organisations. The focus is on acquiring a comprehensive comprehension of concepts, background, and a general understanding of comparable ideas. This technique is generally developed for the function of handing down understanding in an off-the-job area such as training centres, colleges, expert establishments. The focus gets on creating an understanding of basic concepts, history expertise as well as basic understanding of relative suggestions. The strategies utilized in this technique consist of study, role-playing, in-basket, as well as lectures. Workshops, seminars, seminars, as well as conferences likewise come from this group of training. Often, an evaluation is performed at the end of the training as well as a certification of engagement provided[156].

2.2 Theoretical Framework

This research used Emile Durkheim's structural functionalism theory to govern the study of waste management authority management in Nigeria, with Oyo State Waste Management Authority (OYOWMA) as a study.

The structural functionalism, or simply functionalism in some contexts, is a broader outlook in sociology and anthropology that seeks to analyze society as a structure with interrelated parts.

Functionalism considers society as a unit in terms of the role played by its constituent members, i.e., standards, customs, traditions, and institution. A common illustration, made popular by Herbert Spencer, posits these parts of society as "organs" that ensure the smooth functioning of the entity as a whole[157]. Put very simply, it concerns attributing to each feature, custom, or usage as precisely as possible its impact on the functioning of a presumably stable, interrelated system. Structural functionalism argues that society is composed of different parts (e.g., police, hospitals, schools, and farms) that exhibit their own functions, each cooperating to foster social stability. Prominent advocates of structural-functionalism theory are: Herbert Spencer, Talcott Parsons, Emile Durkheim, Robert K. Merton, Almond and Powell, and Radcliffe-Brown[158].

A leading figure in the theory, was interested in how specific populations maintain their core stability and evolve through time. He suggested, for example, that such societies are prone to be segmented, with equal segments held together by common values, shared symbols, or systems of exchange. In contemporary intricate societies, individuals serve very distinct roles, resulting in a high level of mutual interdependence. Based on the metaphor above of an organism in which many parts work together to maintain the whole, Durkheim reasoned that complicated societies are held together by organic solidarity[159].

A scholar argued that society is a distinct level of its own reality, distinct both from functionalism and from the seeming stable and internally unified nature that societies need in order to persist over time. Societies are conceived of as coherent, bounded, and fundamentally relations-based constructs that function like organisms with different parts (or social institutions) working collaboratively in an unconscious, quasi-automatic manner to achieve overall social equilibrium. All social and cultural practices are therefore regarded as functional in the sense of interacting with each other, and are assumed to in fact have a life of their own. They are

fundamental and are analyzed in terms of such function. The individual is not significant in and of itself, but instead in relation to his status, his position in the paradigms of social relations, and the behaviors associated with his status. The social structure is hence a network of statuses linked by roles that correspond to them[160].

Although in the 1940s to 1980s the theory receded, the early writings informed the rise of contemporary structural-functionalism theory. For scholars, social system is made up of the activities of individuals and institutions, which he termed actors. The interaction between two individuals, faced with a variety of possible actions, is affected and influenced by a number of physical and social agents. Each person has expectations about the action of the other and the response to his or her own behavior, and that these expectations are drawn from the acceptable norms and values of the society in which he or she lives[161]. To the extent that the behaviors are repeated in subsequent interactions and these expectations are consolidated or institutionalized, a role is formed.

Structural-Functionalism theory was advanced by Parsons who emphasized the manifest and latent functions as the two distinctive roles. Manifest functions relate to actors' conscious purposes, while latent functions are the objective consequences of their actions, which are often unintentional. Structural-Functionalism theory which is an invention from scholars of political science extradition maintained that to comprehend a political system, one needs to understand not only their institutions or structures, but their respective functions as well[162]. They expressed the view that social institutions are integrated in function to form a robust system, and that a shift in one institution triggers a shift in other institutions; they opined that society is made up of components, each with its distinct functions that work in concert to foster social stability[163].

Drawing on the positions of the above theorists, structural-functionalism has been defined as consisting basically of viewing society as a system made up of a specific arrangement of its parts (structures) that act (functions) in a manner that is coordinated and mutually dependent in order to achieve the goals set for them by society, given that only through this means can equilibrium and peace be maintained within society[164].

Structural-functionalism theory has been heavily scrutinized by conflict theory and Marxism for its failure to explain social transition, contradictions, and conflict. In terms of epistemology, it has been found to be criticized for merely describing social institutions in terms of outcomes and for failing to explain the cause of outcomes. It has also been criticized ontologically because society cannot sustain needs as humans do, and even if society does have needs, they do not have to be satisfied[165].

2.2.1 Using the Theory of Structural Functionalism

The main tenets of the theory are outlined below to enable use of the theory to conduct an analysis of our study, i.e., the administration of waste management in Nigeria: A study of Oyo State Waste Management Authority, (OYOWMA) in carrying out its functions, which has led to ineffectiveness and inefficiency in waste management in the state:

i. The structures within the society exist as connected parts.
ii. Structures that exist in society are connected or based on functions and "organic solidarity".
iii. These structures, which are divided parts, are held together in the similar way by common standards, values, common symbols and systems of exchange.

iv. These interrelated parts or structures jointly perform various tasks, resulting in a strong interdependence and stability that sustains the whole.

v. A social system consists of actions of individuals or institutions called actors.

vi. The behavior of each individual or institution is based on the expectations of the actions and reactions of others.

vii. These expectations and behaviors are based on the accepted and agreed norms and values.

viii. The continuous interplay of expectations and behaviors, based on accepted and agreed norms and values, establishes a role that substantiates the role actors.

ix. Individuals or institutions, in fulfilling their roles, must abide by the standards and values that apply to the nature of the role they are fulfilling.

x. An individual or institution is conscious of the fact that the other party expects him/her to fulfill his/her roles in order to achieve a perfect conditions or equilibrium, a society without any conflicts.

xi. An understanding of the functions of a structure, an institution or an individual is absolutely necessary because it helps to understand a social issue or problem[166].

2.2.2 Applying the Theory of Structural Function to the Research Study

Drawing from the basic ideas of the structural-functional theory outlined above, the following perspectives are derived to analyze our work:

i. The Oyo State Waste Management Authority (OYOWMA) is an arm of the State Ministry of Environment, which constitutes a social system that manages waste of the residents of Oyo State, where OYOWMA's waste management activities take place. The inability of OYOWMA to execute its mandate of operations effectively negatively affects

the metropolitan center's landscape and the health of the people. The populace often reacts negatively to OYOWMA's inability to effectively perform its mission.

ii. On the premise that OYOWMA is properly funded, staffed, mechanically and technologically enabled to perform its activities, it is expected that OYOWMA will maintain a safe and healthy environment in support of its mandate. If OYOWMA experiences shortages in funding. Skilled personnel, technological capabilities, it cannot meet its obligations as stated.

iii. The responsibilities and conduct of OYOWMA and the residents of Oyo are guarded by the core obligation of OYOWMA on one side and that of the masses (customers) on the other side.

iv. These areas of responsibility establish roles for both OYOWMA and Oyo residents (clients) and substantiate them as partners in roles, OYOWMA on one side and residents (clients) on the other.

v. Relying on the principle that individuals or institutions in the fulfillment of their tasks should adhere to the norms that dictate the kind of tasks to be fulfilled. It is argued that the fulfilled duties of the OYOWMA would be to maintain a clean and healthy environment in the state, and that anything contrary to this means that the duties of the OYOWMA have not been fulfilled, i.e. that it has failed to fulfill its own duties as expected.

vi. In respect to the principle that each (individuals or institutions) is aware that others expect them to perform their role in reaching a perfect state of equilibrium, as a society without conflicts.

OYOWMA acknowledges the residents are contributing their part to help OYOWMA maintain a clean and healthy environment in the country. Having the support of local residents, OYOWMA needs to fulfill its duties. In turn, the residents of Oyo know that OYOWMA maintains a clean and healthy environment through its operations; therefore, the residents must fulfill their own obligations. Therefore, if one party does not perform its task, the other party will not perform its task either. It appears that success of one party relies on the success of the other party.

2.3 Review of Empirical Studies

The first relative study reviewed in this research study is titled "The waste management system in low income areas of Jos, Nigeria: the challenges and waste reduction opportunities". According to the researcher, an estimated 2 billion people do not have access to waste collection services, and 3 billion do not have access to controlled waste disposal. This lack of services and infrastructure has a detrimental impact on public health and the environment with waste being dumped or burnt in communities. With waste levels projected to double in Less Economically Developed Countries (LEDCs) by 2025 there are significant challenges facing municipalities who already lack the basic resources needed to manage waste. The United Nations acknowledged the problems of poor sanitation and waste management in the Sustainable Development Goals which sets targets to address these challenges, including the target by 2030 to substantially reduce waste generation through prevention, reduction, reuse and recycling[167].

Jos, the capital of Plateau state in Nigeria, shares the waste management challenges facing cities in LEDCs. The population of Jos is projected to increase from 1.3 million in 2007 to 2.7 million

in 2025, with much of the population living in densely populated areas that lack basic sanitation and controlled disposal of waste. The researcher employed the descriptive method to carry out the research study. Thus, the research presents the results of a detailed investigation into the current waste management system in Jos with a focus on low income areas. Through the adoption of mixed methods the research work identifies how waste is currently being managed and establishes the challenges to sustainable waste management. The existing waste management system was found to be grossly inadequate with 64 communal collection containers being used to collect waste for the entire city, this equates to 20,313 citizens per container. The system leads to most residents disposing of their waste through open dumping in public space and water bodies, and open burning, with impacts to public health and the environment. Key challenges identified include the lack of suitable resources, political interference, poor governance, overlapping responsibilities of agencies, lack of waste awareness amongst the public, and poor infrastructure.

Similarly, thirteen recommendations were presented to help develop an improved waste management system in the study area[168]. Despite reduction and reuse being the priorities of the waste hierarchy there is a paucity of research on the potential of waste prevention within LEDCs especially low income areas. With waste levels projected to increase, waste prevention interventions could play an important role. Following waste analysis and a review of waste prevention initiatives adopted globally, a shortlist of options suitable for the study area was developed.

This shortlist was assessed using Ketso and SWOT analysis facilitated in focus groups representing the waste industry and the community. Community composting was identified as waste prevention intervention with the most potential due to 65.2% of the waste stream in the study area being biodegradable, and only 5.2% of the community currently composting. Benefits

of this approach would be less pressure on the waste collection system, reductions in waste being indiscriminately dumped, increased awareness of waste issues, and compost production that could be utilised in the community.

Furthermore, seven recommendations were presented that in the long term could help to promote waste prevention in the study area including training of community volunteers, engagement with community leaders, and the development of holistic waste awareness campaigns.

Another scholarly work reviewed in the course of this research work is titled "sustainability appraisal of waste management in Nigeria: development and evaluation of an index based tool". The researcher opined that solid waste management assessment is a complex multi-dimensional process, which involves multiple criteria and multiple actors and the many components that make up the system. Although various options such as incineration, gasification and composting are available as a solution for waste management, these options also add to the complexity of the situation in determining most preferred alternatives and decisions[169].

In this study, an in-depth investigation of solid waste management in Nigeria is conducted by quantifying sustainable development to develop an assessment tool. Sustainable development with respect to solid waste management was broken down into its aspects and factors that influence those aspects in a hierarchy of three levels according to the procedure of analytic hierarchy process. Solid waste management practitioners across five locations representing Nigeria's multiple ethnic groups and diverse cultures and the climatic zones as well as four work sectors were surveyed[170].

The researcher employed descriptive method in executing the research. However, primary and secondary source of data collection was employed. Therefore, data were obtained from a paired

comparison based questionnaire survey using Analytic Hierarchy Process. A function was derived that illustrates the potential of SD as a tool for solid waste management assessment. General agreement across sectors was recorded but significant differences exist between regions. The regional difference highlighted indicates context as highly influential. Quick response and cooperation of participants suggests sympathy towards female researcher while slow contact establishment was recorded in Lagos despite an alliance with an indigene of the region. The function derived was adopted to evaluate the solid waste management strategy in Kaduna metropolis of Nigeria using a case study methodology. The accomplished assessment has shown that waste management strategies can be evaluated with the tool developed in this study. An index of 0.457 was established from the evaluation that employed the use of indicators, scoring and normalisation. High scores assigned to indicators will result in a high index, which suggests an effective strategy.

2.4 Conceptual Framework

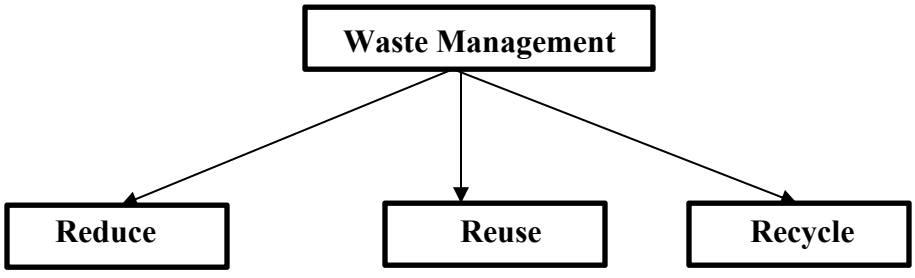

Fig. 2.1 Conceptual Framework on Administration of Waste Management Agency in Nigeria

Source: Author's fieldwork 2023

2.5 Summary of Gap in Literature Reviewed

Amidst the scholarly empirical review above, it is obvious that several studies have been carried out in respect administration of waste management around the world. However, little research has been done or executed in the administration of waste management in Nigeria with a narrowed scope on Oyo State. Therefore, this research study tends to fill this gap. Oyo State is one of the biggest states state in Nigeria. It has 33 local government, has the biggest city in West Africa and one of the biggest rural market in Sub-Sahara Africa. As a result of the aforementioned, a critical study on waste management in the state is necessary if not essential.

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Chapter Three

Methodology

3.1 Research Design

This research makes use of descriptive research method. As the name implies, a survey is a type of research that involves gathering data from predetermined group of people from a whole in order to get insight and knowledge about a variety or varieties of issues[1].

The research is design in a way that addresses the research objectives and research questions which have been itemized by launching an investigation with the aim of providing answers to the questions. The researcher employs primary quantitative research design method of data collection through secondary sources like magazines, published and unpublished dissertation and thesis, journals, articles, internet sources etc.

3.2 Population of the Study

Population refers to cases or individuals that fit a certain specification. It is the entire group the researcher seeks to study. In other words, it is the entire group whose characteristics we want to explain[2]. These elements may be human beings, animals, events, objects and any other phenomenon.

It is important to understand that the population of the study is not arbitrarily chosen. It is determined by the problem under investigation. The population of this study encompasses Oyo State Waste Management Agency. However, the data and information on the activities of these persons will be gathered through secondary source of data gathering.

3.3 Sampling and Sampling Techniques

Sampling simply denotes the technique of selecting individual members or a subset of the population to make statistical inferences from them and estimate the characteristics of the population. However, as a result of the adopted research design for this research study, the sampling is arbitrary not chosen because the research employed qualitative research alongside content analysis.

3.4 Description of the Research Instrument

The research relied on secondary sources of data. Thus, the research instruments used for this work are textbooks, journals, newspaper editorials, magazines, and articles. These instruments where studied diligently in the course of the research.

3.5 Validity of the Research Instrument

Validity of instrument is the ability to make finding that are in agreement with theoretical as well as conceptual values. In order words, validity of the research to measure that is suppressed to be the level of consistency of the measuring instrument. In order to ensure the validity of this research work, the booked reviewed for this research aligns with the research objectives and research questions thereby, maintaining validity. Similarly, the sources of data collected are presented to the researcher's supervisor. Also, it has been subjected to the department's corrections and approval for proper validation.

3.6 Reliability of the Research Instrument

Reliability in this context refers to the dependability of a measurement. However, in the cause of this research work, the researcher work is executed empirically and not subjectively so as to arrive at a logical and more empirical conclusion.

3.7 Administration and Method of Data Collection

This research relies mainly on secondary sources. The secondary sources will include published (and un-published) materials, such as: books, journals, government recordings, and newspapers. The reason for employing this data is the suitability of the means to the research topic. Also, the source is an indication that there are extant works already done in the chosen line.

3.8 Method of Data Analysis

Data collected will be analysed with the use of content method of analysis. The study recommended that for organizational restructuring. That is, refocus and a renewed commitment toward selecting and achieving list of goals with a clearly well-defined plan based on simple comprehensive principles that can be understandable by at least an average citizen in order for them to take part and benefit in it.

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Chapter Four

Results and Discussion of Findings

4.1 Presentation of research Questions

Research Question One: What are the factors affecting the efficacy and efficiency of waste management agency in Oyo State (OYOWMA)?

Lackadaisical Attitude of Employees to Work

In OYOWA, employee productivity is relatively low. This is due to some inevitable factors such as the sociological factor. Here, sociological factor means when employees or staffs feels that they don't have a sense of belonging in a corporation or organization and similarly the employee perceiving the said job as another means of getting income[1]. The forgone employee's attitude to work has created a negative impact on the state government on waste management. Thus, this lackadaisical attitude is not limited to the employee's alone[1]. The government of the day is also culprit of this as a poor attitude by government itself to coordinate staffs, bureaucratic impediment which sometimes leads to chaos, ineffective manner of delivering a good public service to the populace.

Corruption

Corruption is believed to be a cankerworm which has eaten so deep in every nock and crane of the Nigerian populace. Corruption is believed to be the main reason for previous lapses in Oyo State waste management authority. There are instances whereby it has been reported that market women in urban areas had to go to the extent of bribing the waste management officials before they remove waste from the market areas[2]. Similarly, scavengers as well as truck pushers are also believe to go to the extent of bribing officials of the waste management so that they will be allowed to dump their respective refuse or waste. It is important to know that this scenario has

led to the creation of illegal and unauthorized dumpsites in the entire state thereby creating more problems for the agency which is already plague by previous problems[2].

Corruption leads to substandard waste disposal practices that could potentially harm public health. The government's regulatory agencies that should be responsible for enforcing environmental regulations are often corrupt. Bribery and embezzlement of funds lead to insufficient monitoring and enforcement mechanisms, which means that unscrupulous actors can dispose of hazardous waste improperly without any consequences. As a result, tons of medical waste such as syringes, needles, and blood-stained fabrics often find their way into landfills or open spaces where they pose significant health risks. Similarly, corruption slows down the implementation of critical waste management policies. In recent years, the government has enacted several laws aimed at improving the state's waste management processes. However, many of these policies have not been fully implemented due to corruption and bureaucratic bottlenecks. For example, the National Environmental Standards and Regulations Enforcement Agency (NESREA) Act 2007 requires industries operating in the state to submit environmental impact assessment reports before commencing operations. However, many companies have failed to comply with this regulation either because they lack proper understanding or because they choose not to comply bribing their way out[3].

Furthermore, corruption undermines efforts aimed at promoting recycling programs of the waste management system in Oyo state. Recycling is an essential component of effective waste management as it can help reduce landfill usage while generating income for some people who collect recyclables like plastic bottles or metal cans from bins on the streets. However, corrupt

practices such as illegal dumping by organized syndicates prevent recyclers from gaining access to sufficient materials needed for their work[4].

Also, Corruption breeds inefficiency among stakeholders involved in waste management activities including collection agents or contractors tasked with cleaning up streets and neighborhoods. Often times than not officials collude with these stakeholders to inflate the contract sum, thus causing a shortage of funds that could have been used for more effective waste management programs[3]. This inefficiency invariably leads to poor service delivery as waste collection and storage facilities are not properly maintained.

Therefore, Corruption promotes a lack of accountability, transparency and encourages the mismanagement of funds allocated for waste management projects. Funds allocated by the government or donors meant for sustainability and upkeep of materials and equipment needed to manage waste effectively often go unaccounted for due to corrupt practices. The corrupt officials may embezzle these funds or divert them into personal accounts leading to underdevelopment in the sector. Thus, corruption is one of Oyo State waste management authority most significant challenges affecting waste management processes. To tackle this problem effectively, there needs to be a deliberate effort aimed at improving accountability and transparency in governance while severely punishing perpetrators caught engaging in corrupt practices. Additionally, public awareness campaigns on proper waste disposal methods should be carried out so that people can become more informed about environmental issues they face within their communities[2]. If these measures are taken into account with stakeholder involvement across board such as civil society groups working with government agencies, then Nigeria will undoubtedly make significant strides towards efficient and effective waste management policies.

Inadequate Vehicles, Equipment, Plants and Tools Necessary for the Execution of Waste Management

Waste deposited or disposed at every designated collection points needs to be conveyed to the agency's loading station where its believed that sorting is done or to the sanitary landfill, incinerator facility or the depositing final point.it is believed that for the forgone to be well administered and executed, there must be a well-equipped and maintained equipments such as pay loaders, truck tippers, road sweepers, compactors, bulldozers and so on. Inspiration probably needs to be drawn from the municipal solid waste agency in Lagos on how these things are properly managed for the benefit of the populace and the state[5].

A quite number of problems such as lack of spare parts, fund's dearth, non-availability of spare-parts, poor maintenance culture, lack of funds and motivation are some of the problems devilling the agency in actualizing a sustainable environment. The total number of vehicles needed for proper running of the agency is over two thousand while the agency can only boast of a 1200[5].

It is therefore believed that the stretch and heaps of waste which litres the road pollute and infuriate the environments are the results of an inefficient and ineffective disposal and collection management system.

Function Overlaps of Enforcement Agencies

It's important to know that in achieving development, it is linked to establishment and promulgation, regulations, legislation, control as well as enforcement on environmental pollution and management control. Thus, overlaps in the agency's responsibilities in enforcing their various laws often lead to ineffective management of the agency[6]. Waste management is a crucial aspect of any society's development. It helps to prevent the spread of diseases, protect the environment, and promote sustainable living. In Oyo state, efficacy and efficiency of waste

management authority has been a major challenge for a while. One of the primary reasons for this is the lack of coordination between enforcement agencies responsible for managing waste in different sectors. Enforcement agencies are responsible for ensuring that waste is properly collected, transported, and disposed of in accordance with established regulations and guidelines. In Nigeria, there are several enforcement agencies involved in waste management at different levels of government[6]. These include the Federal Ministry of Environment (FMEnv), state ministries of environment, local government councils (LGCs), and private waste management companies.

The overlapping functions of these enforcement agencies have significant implications for the efficacy and efficiency of waste management in Oyo state. For instance, one agency may assume responsibility for collecting and disposing of waste while another agency may be responsible for monitoring and enforcing compliance with environmental regulations. This lack of clarity can lead to confusion as to which agency is responsible for what tasks. Another issue with overlapping functions is that it can result in duplication of efforts by different agencies or departments within the same organization[6]. This could lead to unnecessary costs being incurred by organizations or government bodies involved in waste management. Furthermore, overlapping functions can result in inconsistencies in regulations and guidelines governing waste management across different regions or states within the state. This inconsistency could lead to non-compliance among stakeholders involved in waste management. In addition to these challenges, overlapping functions can also impede effective collaboration between enforcement agencies, resulting in reduced efficiency in managing wastes. Effective collaboration among relevant stakeholders involved would help ensure that regulatory requirements are well understood and adhered to by all parties involved. Thus, it is important that organizations

involved in waste management collaborate more effectively while ensuring there is no duplication or overlap when carrying out their respective roles. The synergy created via effective collaboration would enhance environmental protection efforts as well as improve the lives of citizens.

Population Growth

Nigeria is the most populous country in Africa and the seventh most populous country in the world, with a population of over 200 million people[7]. The country's rapid population growth has put immense pressure on its resources, including waste management systems. Waste management refers to the processes involved in collecting, transporting, processing, treating and disposing of waste materials generated by various human activities. As Oyo State population continues to grow at an alarming rate, so does its waste generation. Waste generation in the state is a function of population density, level of urbanization, and socio-economic status. A high population density in urban areas leads to increased waste generation due to higher consumption rates and lifestyle changes. Urbanization has also led to an increase in industrialization and commercial activities which generate more waste. The rising middle class also contributes significantly to waste generation as their lifestyle involves the use of products that are not biodegradable or recyclable such as plastic bags and containers[7].

Population growth has had a significant impact on the efficacy and efficiency of waste management in Oyo State. This is because managing waste requires adequate infrastructure such as landfills, incinerators, recycling plants and transportation systems. Population growth has led to increased demand for residential buildings, which have taken up much-needed space for waste disposal facilities. This means that there is limited space available for landfills or incineration

sites leading to overflowing landfills and illegal dumping sites becoming common in many areas. In addition, inadequate funding from government agencies responsible for managing wastes has further hampered efforts towards efficient waste management practices. The government resources are stretched thin trying to provide basic amenities such as health care services, education facilities and security which leaves little room for funding initiatives aimed at improving waste management practices[7].

Health Implications

Uncontrolled disposal of solid wastes can lead to public health hazards such as air pollution from burning wastes emitting harmful gases into the atmosphere. The uncontrolled disposal of waste leads to the breeding of harmful insects and pests such as mosquitoes, rats, and cockroaches. This increases the risk of diseases such as malaria, typhoid fever, cholera, and other infectious diseases[7].

Environmental Implications

Population growth in Nigeria has led to increased waste generation which has far-reaching environmental implications. Improper waste disposal causes soil degradation resulting in reduced soil fertility necessary for agricultural activities. This can lead to food insecurity and economic losses for farmers[7]. In addition, improper dumping sites lead to water pollution through leaching of toxic substances into nearby rivers and streams from decomposing waste which contaminates groundwater resources leading to contaminated drinking water sources in nearby communities[7].

Poor Funding

Waste management is a critical issue in Oyo State, and poor funding has negatively impacted the efficacy and efficiency of waste management efforts in the country. In this essay, Thus poor funding remain one of the indices affecting the efficacy of waste management system in Oyo state. Waste management is carried out by both the government and private organizations. However, despite these efforts, there are still significant challenges facing waste management in the state. Funding is crucial for any public service like waste management to function effectively. The lack of adequate funding leads to inadequate infrastructure such as refuse trucks, landfills or incinerators which can result in inefficiencies in waste collection and disposal.

Lack of funding enhance inadequate infrastructure means that collection services which is often available to reach all areas within the state resulting to uncollected wastes littering streets and posing health hazards to people living nearby. Furthermore, if garbage goes uncollected for too long it can create an unsanitary breeding ground for insects and rodents which can lead to disease spread[8]. Poor funding also results in inadequate staffing levels which further exacerbates the problem of inefficiency within the sector. This shortage reduces manpower available for collecting wastes from households or businesses within designated time frames leading to street littering.

Additionally, workers operating with insufficient equipment are prone to easily contract diseases from handling toxic materials while working under unsafe conditions without proper personal protective gear due to lack of funds provided by authorities to keep them safe whilst carrying out their duties. As a result, work-related sicknesses caused by hazardous materials found during collection activities could occur more frequently where safety measures have not been adequately enforced due to financial constraints[9].

Inefficiencies created by poor funding also contribute significantly towards environmental degradation with improperly managed wastes contributing towards land pollution through leaching harmful chemicals into soils or groundwater sources thus contaminating drinking water supplies. This often led to health issues for people living nearby or downriver from the waste dumpsites and could have severe environmental consequences.

Furthermore, the lack of proper funding results in limited public awareness campaigns that can educate communities on the importance of proper waste disposal practices and recycling. This leads to a general attitude of apathy towards waste management and an increase in indiscriminate dumping of waste materials, creating additional environmental hazards[8].

Thus, poor funding has negatively affected the state's ability to efficiently and effectively manage its waste. With inadequate infrastructure, insufficient staffing levels, unsafe working conditions, inadequate equipment supply and lack of public campaigns to raise awareness about responsible waste disposal practices; littering has become commonplace across Nigerian cities causing significant risks to both human health and the environment. The government must prioritize investing more funds into creating sustainable solutions for managing wastes while making sure that workers are provided with necessary safety equipment so as not to jeopardize their health any more than they already are whilst carrying out their duties[9]

Inadequate Policies and Regulations

The absence or poor implementation of policies and regulations contributes significantly to poor waste management. For example, there are insufficient legal frameworks to govern hazardous waste handling and disposal in the state. Consequently, hazardous wastes such as medical wastes

end up being disposed of improperly alongside municipal solid wastes leading to environmental pollution[9].

Research Question Two: What effects do improper waste management poses on Oyo State?

Improper waste management is a significant issue that affects Oyo State in Nigeria. The state has a population of more than 7 million people, and the amount of waste produced by the population is enormous. Improper waste management poses several effects on the environment, health, and economy of Oyo State[7]. Waste pollution has become a significant environmental problem in Oyo State. Improper disposal of waste leads to the accumulation of rubbish in residential areas, streets, canals, and waterways. This not only makes it difficult to navigate these areas but also degrades the aesthetics of the state[10]. When this rubbish lies uncollected for extended periods, it poses a serious health risk by becoming breeding grounds for vectors such as mosquitoes, rats or other insects that carry diseases like cholera, malaria and typhoid fever among others. Furthermore, improper waste management leads to pollution of the air in Oyo State. Large amounts of waste produce greenhouse gases such as carbon dioxide and methane which are harmful to human health and increase global warming with its attendant consequences such as flooding and erosion[10]. The damaging impact on aquatic ecosystems cannot be underemphasized when it comes to how improper waste management affects Oyo State. Dumping waste in rivers or streams causes water pollution which can cause harm not just to fish but also contamination of drinking water sources leading to health problems like diarrhea among others.

Another notable effect with financial implications is that poor waste management will significantly impact the economy of Oyo State. Businesses may suffer if customers are deterred by overflowing rubbish bins or polluted environments around their premises which leads to reduced sales revenue which gradually translates into losses over time if not checked. Besides affecting businesses directly as stated earlier poor sanitation drives foreign investors away from Nigeria while local firms tend to lose out on opportunities due to limited investment capacity brought about by avoidable costs incurred as a result of inadequate or nonexistent sanitation facilities being provided. Thus, effect of improper waste management pose on Oyo state is better understood in the following strata;

Effects of Improper Handling and Disposal of Waste on Environmental Sustainability in Oyo State

Improper handling and disposal of waste have a significant impact on environmental sustainability in Oyo State. The state is located in the southwest region of Nigeria and has a population of over 7 million people. The increase in population has led to an increase in waste generation, which poses a threat to environmental sustainability. The improper handling and disposal of waste is a major issue affecting environmental sustainability in Oyo State, Nigeria. The effects of this problem are numerous and far-reaching, including negative impacts on human health, the environment and economic development[11]. One of the most immediate effects of improper waste disposal is its impact on human health. When waste is not properly handled or disposed of, it can attract disease-carrying organisms and create breeding grounds for pests such as rats and mosquitoes. As a result, people living near improperly managed landfill sites or open

dumpsites are at risk of contracting diseases such as malaria, cholera and typhoid fever. This can lead to increased healthcare costs for individuals and communities.

Improperly disposed waste also has severe impacts on the environment. Landfills that are not properly designed or maintained can lead to contamination of soil and groundwater with hazardous chemicals that can cause long-term damage to ecosystems. Additionally, solid waste that is burned releases toxic gases into the atmosphere which contribute to air pollution - a major global environmental issue[11]. Furthermore, littered garbage poses risks for wildlife through ingestion or entanglement in plastic bags. The economic implications of improper disposal of waste cannot be ignored either. Inefficient waste management practices lead to reduced land productivity due to contamination from hazardous substances found in decomposing landfill materials; less productive lands mean less food production thus higher food prices as well as decreased agricultural outputs which could affect national income via exports. Another significant effect is on tourism potential within Oyo State - uncontrolled garbage dumps reduce the aesthetic value of tourist destinations leading to reduced attractiveness for tourists; this translates into lower tourism revenues.

Environmental Effects

Improper waste management has become a major problem in Oyo state and the consequences of this are quite significant. In this, we will discuss some of the effects of improper waste management in Oyo state[12]. One of the major effects of improper waste management poses on the state is air pollution. This is caused by the burning of waste, which releases harmful chemicals into the. These chemicals can cause respiratory problems, such as asthma and bronchitis. In addition to burning, when waste is dumped in open landfills or on roadsides, it can

also lead to air pollution. The decomposition process releases methane gas, a greenhouse that contributes to climate change.

Similarly, improper waste disposal can lead to water pollution. When waste is dumped open landfills or on roadsides, rainwater can seep through it carry into nearby water bodies like streams and rivers. This polluted water can be hazardous to humans and animals who come in contact with it either directly or indirectly; for example, if they drink from these contaminated sources. Similarly, when wastes are dumped indiscriminately at inappropriate locations like street corners or undeveloped fields, they create eyesores and often result in soil degradation[12]. Waste materials contain heavy metals like mercury which pose serious health risks when ached from the soil into groundwater. Therefore, when littered wastes decompose, they release methane gas. The gas not only adds to air pollution but also could cause explosions if ignited around poorly maintained dump.

Thus, improper waste management has several adverse effects on Oyo State, Nigeria. It affects the environment, health, and economy of the state. The government needs to prioritize waste disposal management by investing in effective waste collection systems, provide incentives for recycling and also enforce strict environmental regulations designed to curb pollution caused by industries and individuals alike[12]. The people themselves should also take individual responsibility for their surroundings by disposing of waste properly and being actively involved in initiatives that promote cleaner cities or communities.

Waste Disposal Manner and Habit of the People of Oyo State

Vast poverty as well as ignorance can be concluded as the reason for poor sanitation habit of most people in Oyo state most especially in the highly density area of the state. It's so surprising

seeing a man for instance defecating on the road in a broad daylight or seeing a woman pulling up while she do her thing in an open gutter or a pedestrian walkway or a scenario whereby a woman or man parks his car and throws refuse on the floor instead of the waste bin, it then beats one imagination why our people are just so untidy[13]. It is a generally agreed assumption that Nigerians are generally dirty while they are in the country but tend to comport themselves outside the shores of the country they may find themselves. Evidence of the above assumption can be seen in the indiscriminating way and matter at which waste are thrown into drainage when it rains or when it doesn't rains in Oyo State.

Effect of Human Population on Oyo State Waste Management

No doubt, human population has an effect on waste collection, waste generation and also waste disposal which can be attributed to population growth which keeps soaring high in geometric progression, as well as increase high standard of living. Oyo state's population rose from 569,755 in 1963 to 2,685,981 in 1991 and to 7,512,855 in 2019[13]. It is most likely that the current population of Oyo state has span up to about 8 million thus impacting negatively both on waste generation and the environment of Oyo state.

Oyo state whose capital is one of the highly densely populated as a result of its cosmopolitan and commercial activities, the quality of waste which is generated is therefore proportional to the population-size. This therefore means that as the state grows in population, the waste generated in the state likewise increases. Not limited to Nigeria, as this problem is being confronted by other urban cities in the world, they are all confronted with the twin problem in name of rapid expansion and population increment.

As a result of the forgone, it has led to continual strain on infrastructural facilities in the urban areas one particular area where this strain is obvious is the waste management area whereby the

existing systems in place are incapable of handling the vast amount of waste which is generated in these areas which thus find itself on the surface[13].

Lastly, it's important to know that there is a correlation between population, increase pollution as well as environmental decay. That is to say, continual increase in population growth in the state has a direct influence on the effectiveness and efficacy of the Oyo state waste management authority.

Research Question Three: What are the best strategies for waste management utilisation and reduction in Oyo State?

Description of the Identified Solid Waste Utilization and Reduction Methods

Solid waste utilization and reduction approaches involve the application of appropriate or suitable management systems or technologies so as to achieve a sustainable and optimum system void of contamination and pollution in the environment[8]. These processes make the environment cleaner, minimize air and water pollution, create employment and save resources for future use.

Generally, this involves the selection and implementation of the appropriate practices, technologies, tools and infrastructure that are necessary to achieve a sustainable system. Thus, every sustainable waste management must include the following strategies, viz; prevention of the generation of avoidable wastes, reduction of the generated waste through recovery, reuse of the recovered wastes, recycling of the recyclables, composting of organic wastes for energy/electricity generation, and eventual disposal at sanitary landfills[1]. With proper consideration of the environmental, economic and social factors peculiar to the particular location, this principle aid waste management agencies in the implementation of a sustainable system[14].

Reduce

This involves the reduction of wastes at the point of generation or before final disposal[9]. It also involves the consideration and incorporation of necessary SW management principles starting from the material design through all the processes to the eventual material consumption. It significantly reduces the quantity as well as the harmful effects of SW generated. This can also be achieved by the use of less but quality material resources in product manufacturing incorporating the principle of reusability of the products through the production and design stages. This will contribute immensely in actualizing solid waste reduction strategy. Industries have major roles to play in the reduction of solid wastes. They can adopt more efficient manufacturing processes by making larger quantities of products without increasing the use of raw materials. In other words, incorporating lesser materials in making products[2]. Another important strategy of achieving waste reduction is the separation at source[2]. This is achieved by providing separate bins/containers, which are clearly labeled, at designated places of collection or generation points like households, industries, workplaces, commercial areas, offices, etc[9].

Some of the possible ways of reducing the quantity of MSW generated include buying products that involve less packaging or buying products in bulk so as to reduce the quantity of materials used for the packaging; making use of reusable items rather than the disposable ones, for instance, the use of handkerchiefs rather than tissue papers, rechargeable batteries, refillable ink pens, etc.; making use of cotton/textile bags for shopping rather than plastic bags; maintaining/repairing of damaged products like clothes, leathers, furniture[10], etc.

Reuse

This involves the use of discarded or disposed-off materials in their original form without transforming them. It also involves the collection of discarded useful products from sources that no longer make use of them and passing the supposed wastes to the ones that can still make good use of the materials. Solid wastes that can be reused include glass bottles, PET bottles clothing, papers/cardboards, leathers, food leftovers, metals, and anything that can be used for a similar purpose to the first intended. These instances clearly indicate that reuse is a very important aspect of MSW management that can foster sustainability[11].

Waste Segregation: Another important strategy is source segregation which involves separating different types of wastes at the point of generation. This makes it easier to handle and manage wastes effectively while also promoting recycling[12].

Waste-to-Energy Conversion: Waste-to-energy conversion involves converting non-recyclable wastes into energy through incineration or other technologies such as gasification or pyrolysis. This provides an alternative source of energy while also reducing landfill volumes[13].

Landfill Management: Landfills are essential components of any solid waste management system; however, their location, design, operation, and closure must comply with international standards to avoid negative impacts on human health and environmental degradation[14].

Public-Private Partnerships (PPP): Public-private partnerships can help to mobilize resources for solid waste management. Governments can partner with private companies for the collection, transportation, and disposal of wastes while ensuring that standards are maintained[15].

Enforcement of Environmental Laws: Strict enforcement of environmental laws and regulations is important in reducing the negative impacts of solid waste on the environment and public health. This will also discourage illegal dumping and promote sound environmental practices[16].

Awareness Campaigns: The first step towards effective waste management is creating awareness among people about the importance of proper disposal of waste. Authorities should conduct awareness campaigns through various media channels to educate people about the adverse effects of improper waste disposal[17].

Recycle

Recycling is one of the most effective ways to manage solid waste as it reduces the need for new raw materials and reduces the amount of waste going into landfills. Government agencies should encourage recycling by providing incentives or tax breaks for companies that recycle their wastes. This involves the reprocessing or transformation of waste materials into other forms before use. When wastes are recycled or treated, they become valuable resources rather than wastes. For instance, paper wastes can be transformed into new paper products that can be used for different purposes like printing, tissue papers, cardboards, etc.; metal wastes and glasses can be melted and transformed into other useful metal and glass products; plastic (PET or HDPE) bottles can be transformed into plastic ropes or coating rubbers for electric wires[12].

The recovery/recycle process helps in recovering, transforming and reusing of valuable materials such as plastic, polythene, paper, organic wastes, etc. hence, improving the economy. These practices significantly reduce the quantity of solid waste disposed-off at the landfills hence, extending the life span of the landfill, reducing the amount of poisonous emissions from those

facilities and saving a reasonable amount of fund for the authority[17]. The composting activities of organic wastes produce composts that serve as nutrient for soil enrichment for both reforestation and preservation of green areas on campus and other areas in the community. Recycling processes majorly include composting and all waste-to-energy processes. Hence, composting and other waste-to-energy technologies are discussed below:

Composting

Composting is a decomposition process that involves the biological conversion of mixed wastes into humus-like substances, also known as compost, by mixed microbial population. Sometimes, for the process to be successful, it must be performed under very optimum and controlled environment with the appropriate moisture level, aeration and temperature[18]. It requires a moisture content ranging from 40–60% and a carbon to nitrogen ratio of about of 25–30:1[18]. It is a process or a strategy employed in the recovery or transformation of mostly organic wastes for other very useful applications[5]. It practically involves the conversion of organic wastes like food wastes, leaves, sludge, fruits, animal waste, etc. into soil humus by microorganisms. The composting process must be managed properly by controlling the biological and oxygen demand as process passes through different stages till the final compost is achieved[18]. In this organic waste composting process, the materials are decomposed into stabilized products useful as conditioners or fertilizers to the soil. The decomposing organisms are widespread in nature. They include actinomycetes, fungi and bacteria. These organisms are spread in many places like in the soil, fruits, vegetables, dust, etc.

Thus, Organic wastes such as kitchen refuse or garden debris can be converted into compost which can then be used as a natural fertilizer for plants. This reduces the volume of organic waste going into landfills while also providing a useful product for agriculture[19].

4.2 Discussion of Findings

Based on the findings the factors affecting the administration of waste management in Oyo State (OYOWMA) are multi-faceted and include:

Lackadaisical Attitude of Employees to Work: Employee productivity in OYOWMA is hampered by a sense of disconnection from the organization, leading to ineffective service delivery. Secondly is corruption: Widespread corruption within the waste management system o substandard disposal practices, illegal dumpsites, and inefficient recycling programs. Corruption also hinders policy implementation and ineffective funding. Thirdly is Inadequate Vehicles, Equipment, Plants, and Tools: OYOWMA lacks essential equipment like loaders, tippers, and road sweepers, leading to waste buildup and environmental pollution. Another is Function Overlaps of Enforcement Agencies: The presence of multiple enforcement agencies with overlapping responsibilities has caused confusion, inefficiency, and a lack of coordination in waste management efforts. More so is the challenge of Population Growth: The rapid population growth in Oyo State has strained waste management infrastructure, resulting in overflowing landfills, pollution, and inadequate funding for waste management initiatives.

Another factor is Health and Environmental Implications: Inadequate waste management practices have led to public health hazards and environmental degradation, including air and water pollution, soil degradation, and the spread of diseases.

Ineffective Funding: Ineffective funding has resulted in insufficient infrastructure, understaffing, unsafe working conditions, and limited public awareness campaigns, contributing to inefficiencies in waste collection and disposal. Inadequate Policies and Regulations: A lack of

robust policies and regulations, particularly regarding hazardous waste management, has led to improper disposal practices and environmental pollution.

Improper waste management has significant effects on Oyo State, Nigeria, impacting the environment, public health, and the economy. The state's population of over 7 million people generates a substantial amount of waste, leading to various detrimental consequences.

Environmental Effects: Improper waste disposal leads to air pollution due to burning waste and the release of methane gas during decomposition. This pollution contributes to respiratory problems, climate change, and the degradation of air quality. Water pollution occurs when rainwater carries waste from open landfills or roadsides into nearby water bodies, posing risks to human and animal health. Littered waste also results in soil degradation.

Health Implications: Improper waste management creates breeding grounds for disease-carrying organisms like mosquitoes and rats. This increases the risk of diseases such as malaria, cholera, and typhoid fever for people living near waste disposal sites. Air pollution from burning waste can cause respiratory problems.

Economic Impact: Poor sanitation and waste management deter customers from businesses, reducing sales revenue. Additionally, inadequate waste management discourages foreign investment and limits local firms' capacity to grow. The tourism industry is also affected, as littered areas become less attractive to tourists, leading to lower tourism revenues.

Poor Waste Disposal Habits: Poverty and ignorance contribute to poor sanitation habits among the population, including open defecation and littering. These habits exacerbate the problem of improper waste management.

Population Growth: Oyo State's rapid population growth strains waste management infrastructure, resulting in overflowing landfills, pollution, and inadequate funding for waste management initiatives. Therefore, addressing these challenges requires investment in effective waste collection systems, recycling incentives, and the enforcement of environmental regulations. It also necessitates individual responsibility in proper waste disposal and active participation in initiatives promoting cleaner communities. Moreover, managing the impact of population growth on waste generation and disposal is crucial for sustainable waste management in Oyo State.

Effective waste management in Oyo State can be achieved through a combination of strategies that emphasize waste reduction, reuse, recycling, and sustainable disposal be considering the following:

Waste Reduction: Focus on reducing waste generation at the source by promoting efficient manufacturing processes that use fewer raw materials. Encourage the use of products with minimal packaging and bulk purchasing to reduce packaging waste. Promote repair and maintenance of products to extend their lifespan, reducing the need for replacements.

Reuse: Encourage the reuse of items in their original form or repurposing them for different uses.

Implement waste segregation at the source to facilitate the collection of reusable materials. Establish collection points for discarded but still useful items to be accessed by those in need.

Recycling: Develop comprehensive recycling programs for materials such as glass, plastic, paper, and metals. Raise awareness among the population about the importance of recycling and provide convenient recycling collection points. Promote waste-to-energy conversion methods to utilize non-recyclable waste for energy production.

Composting: Implement composting programs for organic waste, including food scraps and yard waste. Ensure proper management of composting processes to produce nutrient-rich compost for soil enrichment.

Waste Segregation: Encourage the separation of different types of waste at the source to facilitate recycling and proper disposal. Provide clearly labeled bins and containers for waste segregation at homes, industries, and commercial areas.

Landfill Management: Establish well-planned and environmentally compliant landfills with proper location, design, operation, and closure procedures. Ensure that landfills adhere to international standards to prevent environmental degradation.

Public-Private Partnerships (PPP): Collaborate with private companies for efficient waste collection, transportation, and disposal while maintaining quality standards. Mobilize resources and expertise through PPP to enhance waste management efforts.

Enforcement of Environmental Laws: Enforce environmental regulations to promote responsible waste management practices and discourage illegal dumping. Implement strict penalties for non-compliance to deter improper waste disposal.

Awareness Campaigns: Conduct public awareness campaigns to educate the population about the importance of proper waste disposal and environmental protection. Utilize various media channels to disseminate information on waste management practices.

By implementing these strategies, Oyo State can work towards effective waste management, reduce environmental pollution, improve public health, and promote sustainability. It requires a multi-faceted approach involving government agencies, private sectors, and active community participation to achieve lasting results

Endnotes

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Chapter Five

Conclusion

5.1 Summary of Findings

This research work focuses on the administration of waste management agency in Nigeria's political dispensation citing the Oyo State Waste Management Authority (OYOWMA) as a case study. The research similarly aims at explaining the attitude of the Oyo People towards OYOWMA in maintaining a serene and sanitize environment and also verify the impact of the scavengers in waste management authority.

The researcher started the research by critically examining the study's background which entails the origin of disposal and waste management generation, the birth of industrial revolution, increase in human population and the unchecked/mass migration of people from rural areas to urban cities and industrial towns which in-turn causes a major challenge to waste management.

This research also went further to discuss the way and manner waste disposal is seen all over Oyo State and the subsequent attempt to cub this nemesis by successive government of the state.

The research statement of problem pinpoints the problems which are often associated with refuse and waste management in Oyo State. These problems include by not limited to: incompetent

work force, lack of waste/refuse professionals/experts, and the lackadaisical attitudes of the citizens to Oyo State Waste Management Agency. The research questions of the study were also highlighted in this section. Furthermore, the objectives of study which the research seeks to achieve were similarly stated. Followed after the objective of the study is the research significances which entails the theoretical, practical and empirical significance of the research to the public. The research's limitation as well as the scope of the study was also cleared stated. The limitation of the research entails the hindrance faced by the researcher towards actualizing a productive empirical research. All the forgone comprises of the research's chapter one

The chapter two of the research work which is the literature review reviewed several concepts. Scholarly researches that contribute to the study and concept of waste management and waste were reviewed respectively. The literature review of waste management which was conceptualized includes waste disposal as well as waste management in other countries as well as the Nigerian State. Similarly, the structural functional theory was used to justify the research and the empirical study of the research subsequently follows. Most importantly, the theoretical framework as well as its proponents was used and effectively x-rayed in the application of the research.

Chapter three of the research work extensively focused on the methodology adopted for the research work. The research adopted descriptive research method and quantitative method of data was employed. Due to the fact that lots of research has been carried out relating to this research discourse, the research adopted the secondary source of data collection.

The chapter four of this research work focused on the analysis of the research objectives and research questions. Highlighted research objectives and research questions which was adopted in the chapter one were answered in this chapter. The last chapter of the study which is chapter five

is the concluding chapter of the study and dealt with the summary, conclusion and recommendations for further studies.

5.2 Conclusion

This research aimed at discovering administration of waste management agency in Nigeria's political dispensation citing the case study of Oyo state management authority. The study find out that insufficient funding of OYOWMA has a major negative effect on the efficiency of the agency's administration. As a result of inadequate funding, it often leads to littering of the environment with refuse, delay in staffs will to clear or evacuate refuse and so on.

Similarly, the research also find out that the agency continues to suffer from proper regular checks, insufficient number of engineer personnel at the OYOWMA and the Agency do not carry out continuous exercise and training for its staffs even if they sometimes do. The last time they did was under Governor Abiola Ajimobi's regime. It is also important to know that during the last training exercise that took place, the senior staffs of the agency were the only beneficiary of the training. The training did not include the junior staffs of the agency. With the aid of the forgone, this study thus comes to the conclusion that professional re-training and training of OYOWMA is significantly low. It was also discovered that monitoring and control unit of OYOWMA display incompetency and have impacted negatively on the waste management activities in Oyo State. This is observable as the records of evaders' heighten; court cases between the agency and its client's increases, inability to thoroughly monitor waste disposal at the streets and highways, etc. Findings showed that clients' attitudes make it difficult for OYOWMA to perform effectively.

These attitudes can be failure to pay sanitation rates, indiscriminate disposal of wastes, failure to bag wastes before disposal government-does-everything philosophy of clients (most clients

would take to the easy way of depositing waste along the highway and corners of street for "government" to pick up) etc. all of these have negative impact on OYOWMA and had resulted into shortages of expected amount of the internally generated funds, misallocation of generated fund, unpaid salaries, non-maintenance of equipment and unnecessary psychological distress. However, there is no doubt that there might have been some salient issues in the study that were not adequately discussed and also there might be important issues that were not raised in the course of this work. These inadequacies might have been caused by the limitations of this study. We therefore plead that future research should be geared towards these inadequacies.

5.3 Recommendations

So as to be of help to all other waste management agencies in Nigeria as well as OYOWMA, as a result of the researcher's findings and analysis, the researcher thus comes up with the following recommendations.

i. The Oyo State government should increase and also step up on supplementary allocations which is always which is used to run the affairs of the waste management agency. With the aid of increment in allocation for the agency, it will help train more staffs, pay salaries when due which will in turn be a means of motivation to the staffs of the agency. OYOWMA should in turn regulate as well as strengthen their training programs for all staffs (both the junior as well as the senior staffs). Thus, the agency should step up with effective monitoring of staff by stopping the habit of business as usual so as to make the staffs perform their task and duties diligently.

ii. Environmental/Sanitation protection Court is hereby recommended to be in place so as to persecute and listen to all sanitation/environmental pollution suits as it is also obtainable in other agencies and jurisdiction. The creation of this court would need an effective

policing/monitoring in the rural and urban suburb. However, the creation of this unit will create a positive reduction if not elimination of dumping refuse waste by citizens of the state.

iii. OYOWMA should henceforth, cultivate the habit of organizing a public sensitizing programs so as to re-orientate as well as enlighten people's attitude toward their respectively environ and OYOWMA at large. OYOWMA should also be encouraged to sensitize the people to raise awareness then the OYOMWA staffs are doing their job with lefty hands. The people have legal conscience as well as legal basis to turn the staffs in as much as they pay sanitation fees. The research believes that as this sensitization program goes on fine, it will help to enhance a cordial relationship between the public and OYOWMA and societal obligation by the two parties involved.

5.4 Contribution to Knowledge

This research work contributes to the body of knowledge as it will help to shed more light on the administration of waste management not just in Nigeria but also in developing states of Sub-Sahara Africa.

5.5 Suggested Area for Further Studies

Significant areas for further studies worthy of research is Efficacy and Efficiency of waste management system in Sub-Sahara Africa States.

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- PGD in Public Administration - Lead City University, Ibadan. 2019
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- HND in Business Administration - The Polytechnic of Ibadan 1990
- **WAEC/SC - Lagelu Grammar School, Ibadan. 1982/1983**
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- International Tobacco company, IIorin (Regional Marketing Manager) 1998 - 2000
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E. Membership of Academic and Professional Bodies

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ii. Member, Nigeria Institute of Management (MNIM)

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F. Publication

None

G. Major Conferences Attended with Dates

None

H. References

Available on request

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Signature **Date**

The University Compliance Certification

This is to certify that this project by Victor Muyiwa KAYODE with Matric No. LCU/PG/000351 in the Department of Politics and International Relations, Faculty of Management and Social Sciences, Lead City University, Ibadan is in full compliance with the approved university style and format.

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Signature **Date**