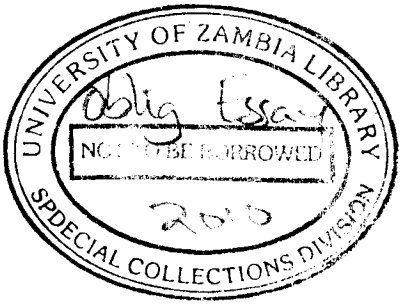
SOLID WASTE MANAGEMENT: HOW EFFECTIVE IS THE LEGAL FRAMEWORK IN COUNTERACTING THE EFFECTS OF SOLID WASTE MANAGEMENT IN ZAMBIA? A CASE OF LUSAKA



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A dissertation submitted to the University of Zambia in partial fulfillment of the requirements for the award of the Bachelors Degree of Laws (LLB)

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ABSTRACT

The issues related to solid waste management are taking a higher level of awareness world wide.

In Zambia, waste management is regulated within the broader framework of the Environmental Protection and Pollution Control Act specifically Part VI of the Act. The EPPCA provides for the sound management of waste to ensure protection of the environment and human life. Under the EPPCA, the Waste Management Regulations of 1993; Statutory Instrument (SI) No. 71 and the Hazardous Waste Management Regulations (SI No. 125 0f 2001) provide for specific procedures and practices for waste generation, storage, transportation and final disposal. In addition, there is a Public Health Act of 1930 and The Local Government Act of 1991.[1]

Industrialization and rapid population growth has become a major concern for Lusaka's environment. The rapidly increasing quantities of waste are generated due to these two factors. As a result, the disposal of waste will become more and more problematic as the amount of waste increases and the land available for landfill decreases. Lusaka alone as a capital city of a developing country has over one million people. [2]

Hence, this high population density results in the formulation of unplanned settlements.

It can therefore be deduced that the existing waste management legislation, although comprehensive for most types of solid waste, is generally not enforced. There are also specific aspects of solid waste management which are inadequately covered by the existing legislation such as guidelines for proper management of hospital waste.

[1] ECZ, "**State of Environment in Zambia 2000**" ECZ, Lusaka – Zambia (2001). Pg 105
[2] Solid Waste Management Master Plan Project for the city of Lusaka (1997) P.4

DEDICATION

I would like to dedicate this piece of work to my husband Silvester Moyo and the children Brian, Annie and Taonga not forgetting my nephew Kenny and my sister Emma for their love and support throughout my studies. The stress they went through though immeasurable has finally come to fruition.

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I write with a view to express my sincere thanks and gratitude to all members of my family for the support they rendered during the period I was writing this dissertation.

I also wish to extend my gratitude to Mr. F. Mudenda, my supervisor for his support and guidance which resulted in the successful completion of this dissertation.

Last but not the least; gratitude is also extended to some organizations/institutions that rendered assistance in different ways. These include the Environmental Council of Zambia with special respect to Mr. S. Zimba (Senior Inspector), its library, the University of Zambia Library and Lusaka City Council.

LIST OF ABBREVIATION AND ACRONYMS

DWAF:	Department of Water Affairs and Forestry
ECZ:	Environmental Council of Zambia
EPPCA:	Environmental Protection and Pollution Control Act
HCWM:	Health Care Waste Management
HIV:	Human Immune-deficiency Virus
IDP:	Integrated Development Plans
IWM:	Integrated Waste Management
KZN:	Kwa Zulu Natal
LCC:	Lusaka City Council
MSWM:	Municipal Solid Waste Management
NCS:	National Conservation Strategy
NEAP:	National Environmental Action Plan
NGO:	Non Governmental Organisations
PCB:	Polychlorinated biphenyls
TR:	Township Regulations
WMU:	Waste Management Unit

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CHAPTER ONE

1.1INTRODUCTION:

This essay seeks to assess the adequacy and effectiveness of the legal frame work regulating solid waste management in Zambia.

Generally, it is acknowledged that protection of the environment has been an important cornerstone of human and sustainable development. Thus, environmental legislation draws its principles from many sources but especially from multi-lateral and international environmental conventions. For instance, Zambia is a signatory to The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 22 March 1989.[1]

In Zambia, waste management in general is regulated within the broader framework of the Environmental Protection and Pollution Control Act (EPPCA)[2]

To understand waste management in Lusaka, one has to look at the historical background. Historically for the City of Lusaka, the Lusaka City Council delivered solid waste management services directly financed through normal municipal financing channels such as government grants and property rentals on council owned properties or property rates. From middle 1980s to early 1990s, financing of Municipal Waste Management Services through these traditional means was no longer attainable.[3] This was attributed mainly to declining national economy which saw a significant decline in governmental grants to local authorities Lusaka inclusive. The

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[1] P. Sands and P. Galizzi, **Documents in International Environmental Law.** Cambridge: At the University Press, 2004.

[2] No: 12 of 1990. Cap 204 of the Laws of Zambia.

[3] LCC and ECZ, (2004) "**Lusaka City State of Environment Outlook Report.**" LCC and ECZ Lusaka-Zambia.

situation was exacerbated by the sale of the Council owned Housing stock which was one of the major sources of income for local authorities in form of rentals. Consequently, delivery of waste management services crumbled and was limited to sporadic collections at public trading places (Markets) or in emergency response during the disease outbreaks, mainly cholera. In other parts of the city, the private sector came in to fill the void left by the council by providing waste collection services to those who can afford to pay directly.[4]

Therefore, waste management is a challenge for Lusaka City. The main waste streams in the city include Domestic, Commercial, Industrial and Hazardous waste.

1.2 STATEMENT OF PROBLEM:

In the current state, waste generated from all sectors of the city's economical activities is not effectively managed. Although, waste management is provided for under the broader framework of the Environmental Pollution Prevention and Control Act, the management provided there under, has a number of drawbacks and challenges. Lack of enforcement and awareness are the major ones.

1.3 PURPOSE OF THE STUDY:

To make necessary recommendations on how to enhance the effectiveness of the legal frame - work on solid waste management, to promote efficiency in management and public awareness.

[4] Ibid P.54

1.4.0 OBJECTIVES:

1.4.1To briefly trace the historical background of the legal frame work on solid waste management in Zambia.

1.4.2 To find out the adequacy of the current regulations or guidelines on solid waste management.

1.4.3 To find out how effective the legal frame work has been on solid waste management.

1.4.4 To find out how much knowledge on solid waste management people of Lusaka City have and if at all they know the dangers of poor solid waste management or staying in a dirty environment.

1.4.5 To compare waste management accorded by the Zambian legal frame work with that offered by other jurisdictions with specific reference to some of the SADC nations.

1.5.0 HYPOTHESIS/RESEARCH QUESTIONS:

1.5.1 Why does the current legal frame work not provide adequate guidelines which seek to enhance implementation and enforcement on solid waste management?

1.5.2 Why is it that the keep Lusaka clean campaign only active in commercial centers and planned settlement areas?

1.5.3 How far is the government involved in the solid waste management since it is only implemented partially in commercial centers and planned settlement areas and not in peri-urban areas where there are high levels of waste disposal?

1.6 SIGNIFICANCE OF THE STUDY:

The significance of this study is to promote the need for a clean and health environment. It also helps in appraising the implementation and enforcement of environmental policies and provision of public awareness as regards solid waste management.

1.7 METHODOLOGY:

The research methodology to be used in this study is based on the collection of both primary and secondary data. The primary data will be collected using structured questionnaire, having a personal interview with different people from both public and private sectors and physically visiting areas of interest with regards to solid waste management. Where as, the secondary data collection will be based on literature review such as articles, past research reports, books, statutes and publications. Finally, data collected from different sources will be analyzed using both qualitative and quantitative analysis. Therefore, the foregoing discussion shall be discussed as tabulated in the following proposed chapters.

1.8.0 PROPOSED CHAPTERS:

1.8.1 Chapter Two

This chapter intends to look at the historical development of Environmental Law on solid waste management in Zambia, stating the changes that have taken place since 1964 to date and analyzing the adequacy of the current regulations.

1.8.2 Chapter Three

This chapter intends to look at the effect of industrialization and unplanned settlements regarding solid waste management.

1.8.3 Chapter Four

This chapter intends to compare the management of solid waste management in Zambia with other jurisdictions especially with reference to some of the nations in SADC, such as Botswana and South Africa.

1.8.4 Chapter Five

This chapter intends to give the conclusion and recommendations from the findings of the whole research as to why the local authority fails to implement and enforce the current guidelines in place.

CHAPTER TWO

2.0 HISTORICAL DEVELOPMENT OF ENVIRONMENTAL LAW ON SOLID WASTE MANAGEMENT IN ZAMBIA

2.1 BACKGROUND

The management of solid waste has over the years been a very difficulty and challenging issue for the Nation. Even as we got political independence from our colonial masters in 1964, we never got independence for a clean and health environment. Thus, we have not yet achieved independence of a clean and health environment.

This challenging issue has manifested itself in the perennial outbreak of diseases such as cholera, dysentery, and pollution of water resources, air, soil, or land contamination and the loss of aesthetic beauty. As a result, the inappropriate and often careless handling of both municipal and industrial wastes including those that are hazardous has all too often created problems for human health and the environment.[5]

Therefore, in order to make a clean and green Zambia, the government of The Republic of

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[5] ECZ, **National Solid Waste Management Strategy for Zambia**, (2005).pg.vii

[2]No: 12 of 1990 Cap 204 of the Laws of Zambia.

Zambia before enacting the Environmental Protection and Pollution Control Act (EPPCA) [6],

initiated the formulation of the National Conservation Strategy (NCS) in 1985, to identify measures for improving waste management and subsequently the National Environmental Action Plan (NEAP) in 1994. In both these documents, waste management among others was identified as one of the major environmental problems faced by the Nation.[7]

Hence, improvements are desired in waste management covering aspects of minimization of waste generation, collection, re-use, recycling, treatment and disposal. In this regard, the Government of the Republic of Zambia enacted legislation such as the Environmental Protection and Pollution Control Act (EPPCA), which established the Environmental Council of Zambia to provide for the control of activities related to environmental protection. In 1993, regulations for the licensing of transporters of waste and operators of waste disposal sites came into effect whilst the regulations governing the control of hazardous waste were signed in 2001. [8]

Solid Waste is defined under Section 47 of the EPPCA *as garbage, refuse, sludges and other discarded substances resulting from industrial and commercial operations and from domestic and community activities but does not include waste water as defined in Part IV.* This includes such classes of waste as hazardous including waste oils, and wastes arising from mining activities excluding gaseous waste and waste water.

Management is defined under Section 47 of the EPPCA as *a person who is, directly or through an agent, involved in waste management.*

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[7] ECZ, **National Solid Waste Management Strategy for Zambia**, (2005).pg 1
[8] Ibid pg 1

2.2 THE OPERATIONAL LEGAL AND REGULATORY FRAMEWORK OF SOLID WASTE MANAGEMENT

First and foremost, it suffices to state that the Constitution of Zambia[9] which is the Supreme Law of the land provides for a Clean and Health Environment. The Constitution under the Directive Principles of State Policy and Duties of a citizen under Article 112 (h) provides that; the state shall strive to provide a clean and healthy environment for all. Nevertheless, both the state and the citizens must play an active role in the enhancement of a clean and health environment.

Therefore, as a result of problems arising from solid waste management, Zambia as a state has recognised the need for a strengthened legal framework for the management of waste. In this regard, the EPPCA which is a result of the recommendation of the National Conservation Strategy (NCS) of 1985 to have legislation that encompasses all environmental aspects, forms the basis of the frame work.

The EPPCA under **Section 48** empowers the Environmental Council of Zambia to give specific or general directions to District Councils on their functions in relation to collection and disposal of waste operations. In addition, the Environmental Council of Zambia may delegate all or any of the duties of the inspectorate to a local authority as necessary in accordance with **Section 82** of the EPPCA.

[9] Chapter 1 of the Laws of Zambia

In view of the above powers conferred upon the Environmental Council of Zambia, and given a situation where the local authorities like the Lusaka City Council have no capacity to perform their functions in relation to solid waste management, it would render this delegation of power to local authorities by the Environmental Council of Zambia not operative.[10]

The EPPCA which came into effect in 1992 is the principal law on Environment. It provides for the requirements of handling waste such as the licensing or permitting process for collection, transportation, treatment and disposal of waste.

Finally, under the EPPCA, the Waste Management Regulations (SI No. 71 of 1993) and the Hazardous Waste Management Regulations (SI No. 125 of 2001) provide for specific procedures and practices for waste generation, storage, transportation and final disposal.

Furthermore, the EPPCA and its subsequent regulations SI No. 71 and SI No. 125, empowers the Environmental Council of Zambia to monitor industry and commerce in waste management, including Hazardous Waste. Under these regulations, the following activities are undertaken to ensure an environmentally sound waste management practice in the country:

1. Licensing of Waste Generators and Transporters/Managers, provided for under both SI No. 71 of 1993.
2. Compliance monitoring/patrols provided for under SI No. 125 of 2001, Section 15(1)

[10] LCC and ECZ, "**Solid Waste Management Master Plan Project for the City of Lusaka**," (1997) Lusaka, pg 21

3. Attending to public complaints and emergencies provided for under Part II (Section 6) of the EPPCA . [11]

In addition, other supporting pieces of legislation with regard to solid waste management include the Local Government Act of 1991 which plays a key role in the formulation of by-laws and regulations in each local authority's area of jurisdiction and the Public Health Act of 1930 which regulates the prevention and suppression of diseases. [12]

2.2.1 LOCAL GOVERNMENT ACT AND COUNCIL BY-LAWS

This Act provides for an integrated three tier local administration system. It provides for the establishment of local authorities and local government administrative system. It also empowers local councils to make by - laws and policy which should not be in conflict with other existing laws on matters related to environment.

Therefore, the Local Government Act sets out the functions of the local authorities very explicitly even in relation to Solid Waste Management. This is set out in the second schedule of the Act.

The functions of a council are;

1. To establish and maintain offices and buildings for the purpose of transacting the business of the council and for public meetings and assembles.
2. To ensure against losses, damages, risks and liabilities which the council may incur.

[11] LCC and ECZ, (2004) "**Lusaka City State of Environment Outlook Report.**" LCC and ECZ Lusaka-Zambia. pg 56
[12] Ibid pg 59

3. To maintain law and order and ensure national security and the good administration of the council. General administration
4. To prohibit and control the erection and display of advertisements and advertising divises in, or in view of, streets and other public places.
5. To establish and maintain farms and allotment gardens.
6. To take and require the taking of measures for the
   (a) Storage, market and preservation of agricultural procedure;
   (b) Conservation of natural resources, and
   (c) Prevention of soil erosion, including the prohibition and control of cultivation.

In addition, there is Council by - laws made under the Local Government Act which have an impact on Solid Waste Management, for example, the Township Regulations (TRs) and Market by – laws. The solid waste management aspects that are covered by the TRs are the following;

- prohibition of burning refuse in public places,
- setting out of fees to be charged for the removal of refuse from non-domestic premises,
- property owners' obligations to provide dust bins with lids,
- keeping storm drains clear,
- prohibition of the deposition of refuse in public streets, and
- Unauthorized disposal of refuse, thereby prohibition or denying the local authority reasonable access to the removal of refuse and disposing of it in an unauthorized manner.[13]

[13] LCC and ECZ, (2004) **"Lusaka City State of Environment Outlook Report."** LCC and ECZ Lusaka-Zambia. pg 58

2.2.2 PUBLIC HEALTH ACT

Section 75 of the Public Health Act empowers the Minister of Health to make regulations and to confer powers and impose duties on Local Authorities in connection with sanitation and housing, including the management and disposal of liquid and solid waste.

To this end, the Public Health (Drainage and Latrine) of 1963 Regulations were promulgated. The Public Health (Meat Abattoir and Butcheries) Regulations are made under part Xl of the Public Health Act, **Section 82** of the Act deals with Water and Food Suppliers. On the other hand, the Public Health (Infectious Diseases) Regulations are made under Sections **12, 28, and 103** of the Public Health Act. [14]

2.2.3 WASTE MANAGEMENT REGULATIONS

It is worthy stating that Waste Management Unit introduced by the Lusaka City Council was created through Section 47 of the EPPCA to undertake functions stated in Section 49 of the same Act. Among the many functions to be carried out are as follows;

- Formulate standards on the classification and analysis of waste and advise on standard disposal methods and means.
- License and regulate the handling, transportation and destruction of any hazardous wastes.
- License and control the generation of hazardous wastes.

[14] LCC and ECZ, "**Solid Waste Management Master Plan Project for the City of Lusaka**," (1997) Lusaka, pg 21

- Monitor the contamination and degradation of the environment arising from the operation of any disposal site.
- Collect and maintain statistical data on the nature, quality and volume of waste generated on sites and waste processing where waste disposal is taking place or has taken place.
- Undertake country wide inspections, licensing and enforcement of all rules and regulations outlined in this Act.[15]

On the other hand, the Waste Management Regulations (Statutory Instrument No. 71 of 1993) provides for the control of transportation of waste and management of waste disposal sites. Thus, the local authority and private waste management companies through franchise contracts, transporting waste or operating waste disposal sites, are required to obtain licenses from Environmental Council of Zambia and have to adhere to conditions and standards set by the Council. Some of the conditions to be followed which are covered under SI No. 71 are;

- discharge of waste so as to cause pollution in the environment is forbidden,
- collected waste should be transported to a licensed site only,
- hazardous waste generation should be licensed,
- a waste disposal site should be enclosed and secure from scavenging,
- avoid surface and ground water contamination through landfill operations,
- the frequency of collection of waste should be carried out in order to keep all parts of the city clean, and
- Transporters of waste should have a valid license.

[15] Environmental Council of Zambia, Semi Annual Report for January – June, (1997)

2.2.4 HAZARDOUS WASTE MANAGEMENT REGULATIONS OF 2001

The Hazardous Waste Management Regulations (Licensing of Transporters of waste and operation of waste disposal wastes) Statutory Instrument No. 125 of 2001 provides for the control of hazardous waste so that the waste is managed in an environmentally sound manner through waste prevention, reduction, recycling, incineration and land filing.

Hazardous Waste is defined under Section 47 of the EPPCA *as waste, including objects, articles or substances, which are poisonous, corrosive, irritant, explosive, inflammable, toxic or harmful to man, animal, plant or the environment.*

The regulations further provide for control of generation, collection, storage, transportation, treatment, import, export and final disposal of hazardous waste.[16]

2.2.5 INTERNATIONAL CONVENTIONS RELATED TO WASTE MANAGEMENT

The Basal Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 22 March 1989, was originally established to address the global problem of uncontrolled movement and dumping of hazardous wastes, including incidents of illegal dumping in developing countries by companies from developed countries. [17]

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[16] Ibid pg 3

[17] P. Sands and P. Galizzi, **Documents in International Environmental Law,** Cambridge: At the University Press, (2004), pg 881

This was of great concern as indiscriminately disposed, accidental spillage or improper management of hazardous waste can pose severe health problems, even death and can poison water and land for decades.[18] The Basel Convention is therefore a global agreement ratified by member countries including Zambia on 22 March, 1989 and came into force on 5th May, 1992, for addressing the problems and challenges posed by hazardous waste.

The Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa, 29th January, 1991 is the Convention on the ban of the import into Africa and control of transboundary movements and management of hazardous wastes within Africa which was adopted by members of the African Union in 1991 and came into force in 1998.[19]

According to Article 4(1) of the Bamako Convention, the ban on importation of hazardous wastes is absolute and any violation of it is considered a criminal act.

2.3 AN OVERVIEW OF THE CURRENT STATUS OF SOLID WASTE MANAGEMENT IN ZAMBIA

It would appear that there are comprehensive laws in place but lack of enforcement and awareness is the major problem.[20]

[18] Ibid Pg 882
[19] Ibid pg 936
[20] LCC and ECZ, **"Solid Waste Management Master Plan Project for the City of Lusaka,"** (1997) Lusaka, pg 10

The National Solid Waste Management Strategy for Zambia of 2004 also identifies some of the weaknesses with regard to Solid Waste Management in Zambia and these are;

- Duplication of responsibilities
- Inadequate enforcement capacity
- Inadequate revenue
- Inadequate legislation
- Inadequate resource infrastructure
- Slow in providing information
- Inadequate plans in place
- Inadequate trained workers at Local Government Level and
- Inadequate bye-laws [21]

Therefore it suffices to state that apart from the adoption of a detailed and well-structured waste policy, the waste industry requires a legal framework that enables it to reach set objectives and targets. A well elaborated legal frame will assist in the effective implementation of those targets. The legal frame work must also be provided with an effective enforcement system. [22]

Thus, despite the broader legal frame work regulating solid waste management in Zambia, generally, the current waste management situation leaves much to be desired.[23]

[21] ECZ, **National Solid Waste Management Strategy for Zambia**, (2005), Pg 59
[22] International Solid Waste Association (ISWA) Industry as a partner for sustainable development, WASTE MANAGEMENT, U.K (2002) pg 40.
[23] National Solid Waste Management Strategy for Zambia, (2005), Pg 4

Wastes generated from all sectors of the economy are currently not well managed. The critical issues for this sector are waste generation, collection and disposal, institutional and infrastructural capacity for the management of waste in the city.[24]

For example, taking the Lusaka situation as a reference point, less than 14% of the waste generated in the urban centers finds its way to the disposal sites.[25]

While even this less that finds its way there, some of it, falls in the hands of scavengers as observed when visited the Chunga site on 12th December, 2009.

Hence, to ensure sustainable waste management for the city of Lusaka, waste management is administered on two levels thus, Municipal Solid Waste Management and Hazardous Waste Generators. [26]

Municipal Solid Waste Management is a responsibility of the Local Government Act regulated by the Environmental Council of Zambia (ECZ) as earlier alluded to. Hazardous Waste Generators are directly regulated by ECZ with a possibility of delegation of such functions to the Local Authority under the Environmental Prevention and Pollution Control Act (EPPCA).[27]

It therefore suffices to state that despite a wide legal frame work regulating solid waste management in Zambia, the country is faced with a critical waste management problem, which is

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[24] Ibid pg 75

[25] Julliet Chileshe, **Report on Environment in Zambia** held at Fair view hotel, (2005), Lusaka.

[26] LCC and ECZ, (2004) **"Lusaka City State of Environment Outlook Report."** LCC and ECZ Lusaka-Zambia. Pg 75

[27] Ibid Pg 76

threatening the health of the people of Zambia, socio-economic development as well as the environment. Some of the major concerns include;

- Littering, uncollected garbage, and indiscriminate dumping of waste;
- Improper handling of hazardous wastes;
- Health hazards due to indiscriminate disposal sites; and
- Potential for contamination of soils and underground/surface water from operations of disposal sites and the indiscriminate disposal of wastes.[28]

Therefore, strengthening the enforcement and implementation of both the EPPCA and By-Laws is still the cardinal issue for the government if a clean and health environment is to be achieved. For instance, taking Lusaka City as a reference, much has been done theoretically but practically, less has been achieved.

Since 2003, Lusaka City Council has been implementing the Lusaka Waste Management Project whose overall development objective is to establish sustainable and poverty oriented Municipal Solid Waste Management (MSWM) System. The immediate objectives have been achieved with the exception of financial sustainability.

Nevertheless, in spite of the above assertion, Lusaka has no clearly established Hazardous Waste disposal mechanisms and facilities. Health Care Waste is generally disposed off through incinerators located at various clinics. However, these incinerators are not up to standard in terms

[28] ECZ, **National Solid Waste Management Strategy for Zambia**, (2005).pg 6

of emissions and require upgrading. [29] This should be taken care of in the regulations.

Furthermore, according to the author's observations, public awareness and education campaigns have been conducted to sensitize the citizens of Lusaka on the benefits of the improved Waste Management System e.g. through the print and electronic media, cultural groups, e.t.c but to no avail.

In addition, although Lusaka has developed a strategic Plan for Solid Waste Management, implementation depends on the Local Authority's ability to raise needed financing through improved Solid Waste Management service delivery and partnerships with the private sector since revenue generation is still low.

Finally, it can be stated that the achievement of a clean and quality environment that would promote economic, social and cultural development requires concerted efforts from the government, the general public and the private sector if enforcement and implementation of the regulations in place are to be achieved.

[29] LCC and ECZ, (2004) "**Lusaka City State of Environment Outlook Report.**" LCC and ECZ Lusaka-Zambia. pg 75

CHAPTER THREE

3.0 EFFECTS OF INDUSTRIALISATION AND UNPLANNED SETTLEMENTS ON SOLID WASTE MANANGEMENT IN ZAMBIA

3.1 INTRODUCTION

In Zambia, solid waste has been a talking point for many years. Poor garbage disposal has been an eyesore in many parts of the country. Therefore, the issue of Solid Waste requires serious attention because it has a direct impact or effect on the human health and the environment.

Waste may be generated from residential, commercial, industrial, agriculture and institutional areas/settings. But, rapidly increasing quantities of waste generated due to industrialization and population growth during the last few decades has become a major concern for Zambia's environment. The annual average rate of this waste in Lusaka alone is increasing and is expected to grow from 220 000 tones to 530 000 tones in 2011, an increase 14%.[30]

This has almost made it impossible for the municipal authorities to fulfill their obligations concerning solid waste management due to limited financial capacity and lack of trained manpower. Only a fraction of this solid waste is collected and disposed at designated sites. The remaining uncollected waste has become a major concern for the responsible authorities as this has caused several outbreaks of cholera and other diseases and a general deterioration of the environment especially in the peri-urban areas and the adjoining high-density "compound". [31]

[30] ECZ, "**State of Environment in Zambia 2000**", ECZ, Lusaka – Zambia, (2001). Pg 104.
[31] Ibid Pg 105

Industrialization and rapid population growth has become a major concern for Lusaka's environment. The rapidly increasing quantity of waste is generated due to these two factors. Lusaka as a capital city of a developing country has over one million people.[32] This high population density and growth rates is coupled with expanding and formulation of new unplanned settlements. Thus, industrialization can be regarded as a double edged sword, pushing our economy and at the same time causing adverse environmental problems by producing industrial wastes which they are failing to manage. It is this urban growth and industrialization that has resulted in increased amounts of waste which has become an eyesore and a hazard to the environment and human health.[33]

Furthermore, Health Care Waste Management (HCWM) at all levels of health care provision is generally unsatisfactory in Zambia. Many health care facilities do not take due responsibility for the waste they generate to ensure safe, sustainable and environmentally acceptable methods for segregation, storage, collection, transportation, pre-treatment and final disposal both within and outside their premises.[34]

Therefore, Waste Management is a challenge for Lusaka City and the main waste streams in the city include, Domestic, Commercial, Industrial and Hazardous Waste.

3.2 DOMESTIC WASTE

This category of waste comprises mainly of wastes that are generated from household activities. This normally includes such materials as waste paper, plastics, wood off cuts, kitchen waste and

[32] LCC and ECZ, "**Solid Waste Management Master Plan Project for the City of Lusaka**," (1997), Lusaka. Pg 1
[33] LCC and ECZ, "**Lusaka City State of Environment Outlook Report**." LCC and ECZ Lusaka-Zambia. Pg 54
[34] Environmental Council of Zambia, **Minimum Specifications for Health Care Waste Incineration**, (2007) Pg 1

yard waste. [35]Currently there is no separation of the various types that constitute this category. The waste components are usually mixed and dumped in places that are not designated for disposal. Much of this type of waste is generated from residential areas and at the moment, the Lusaka city council is finding it difficult to collect solid waste from unplanned settlement areas like 'Misisi' Compound.[36]

3.3 COMMERCIAL WASTE

This is the waste stream that is generated from commercial and business houses and will normally compose of such materials as discarded office paper, cardboard, plastic and general packaging waste. The management of this type of waste like for domestic waste is also not well defined. This is exhibited by the presence of piles of uncollected waste in town centers[37] as shown on Muvi TV Main News bulletin of 8th February, 2010.

3.4 INDUSTRIAL WASTE

Various industries such as manufacturing (of oil, sugar), refining (petroleum), chemicals (e.g. Nitrogen Chemicals of Zambia) and mining (e.g. privatized units of the Zambia Consolidated Copper Mines) exist in Zambia. These produce a variety of wastes that are both hazardous and

[35] ECZ, National Solid Waste Management Strategy for Zambia, (2005), Pg 4
[36] National Solid Waste Management Strategy for Zambia, (2005), Pg 4
[37] National Solid Waste Management Strategy for Zambia, (2005), Pg 5

non-hazardous. The extraction of raw materials and energy production are also principal sources of waste and a cause of major problems.[38]

In other words, this is waste that is generated from industrial production processes. Types in this category include such wastes as industrial sludge from factories, manufacturing facilities and refineries. It also includes food processing waste and ash from industrial combustion processes. This waste stream also covers wastes from mining activities such as waste rock, tailings and slag.[39]

3.5 HAZARDOUS WASTE

This is the type of waste with such characteristics as flammability, irritability, ignitability, corrosivity and toxicity. Examples include; industrial hazardous waste products such as wastes containing heavy metals such as lead and chromium, polychlorinated biphenyls (PCBs), asbestos and ink sludges. Other types include, lead acid batteries, clinical waste and waste oils. This category also includes wastes from hospitals and other health care facilities. It is characterized by such types as sharps, swabs and pathological and cytotoxic wastes. [40]

Hazardous waste is waste or a combination of waste that poses an immediate potential hazard to the public health and the environment.

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[38] ECZ, **State of Environment in Zambia 2000,** ECZ, Lusaka – Zambia, (2001). Pg 106
[39] ECZ, **National Solid Waste Management Strategy for Zambia,** (2005), Pg 5
[40] National Solid Waste Management Strategy for Zambia, (2005), Pg 5

3.6 HEALTH CARE WASTE

Health waste is one stream that is becoming one of the major concerns in the area of waste management. With increasing population and a corresponding increase in number of Private Clinics, the amount of waste generated from this sector is exceptionally high thereby exerting pressure on the available treatment and disposal facilities.[41] However, it is important to note that there are currently no adequate facilities for treatment and disposal of health care waste. Incinerators for disposing of health care waste is mainly found in large hospitals while some of the clinics use pits or burning chambers or even nothing for disposal. As observed by the Forum for Democracy and Development (FDD) President[42] that, "pregnant women were being told to take buckets with them when going to deliver at Chipata Clinic in Lusaka because there was no were to throw the placenta after delivery."

Many of these incinerators do not even meet environmentally acceptable standards and legal requirements for air emissions or waste disposal. Untreated Health Care Waste has been seen at disposal designated for general waste where scavenging is practiced without taking necessary measures to control or abate it.[43] Incineration is thus a common method of Health Care Waste disposal in Zambia which either reduces the volume of the waste or renders it less harmful.

Therefore, the urgency to implement measures to manage health care waste emanates from the potential of infection from objects contaminated with Human Immune-deficiency Virus (HIV)

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[41] Environmental Council of Zambia, **Minimum Specifications for Health Care Waste Incineration**, (2007) Pg 1

[42] Post News Paper, 18th March, 2010.

[43] Minimum Specifications for Health Care Waste Incineration, (2007) Pg 1

and Hepatitis viruses B and C.[44] There is need therefore to put in place a system to address healthcare waste.

3.7 WASTE GENERATION

There has been an increase in the amount of waste generated in the city. In 2006, the total waste generation was estimated at 242 803mt. Households are the main generators of waste, contributing about 75 per cent of the total amount of waste generated. Peri- urban areas are the main sources of all waste fractions except paper and cardboard. [45] A high number of people are involved in trade/business for various goods which coupled with general households; generate large amounts of solid waste. [46]

The non residential areas (industry and commerce) are the main generators of waste paper and cardboard with the sector contributing about 41 per cent of the total amount generated. According to the Institutional Waste Survey for the City of Lusaka conducted in 2002, it was estimated that institutions in the city generate a minimum of 439.3 tons of waste per month, of which paper and cardboard constituted about 268 tons per month and 123 tons per month were leftover food stuffs. In addition, garden waste and PET bottles, cans, tins, plastics, tetra packs, etc contributed approximately 26.3 tons of waste per month.[47]

Therefore, it suffices to state that an estimated 243,000 tons of municipal solid waste was generated in 1996 in Lusaka alone. Of this, more than two thirds was generated in high-density

[44] ECZ, **National Solid Waste Management Strategy for Zambia**, (2005), Pg 6
[45] LCC and ECZ, "**Lusaka City State of Environment Outlook Report**." LCC and ECZ Lusaka-Zambia. Pg 54
[46] Lusaka City State of Environment Outlook Report." LCC and ECZ Lusaka-Zambia. Pg 54
[47] Lusaka City State of Environment Outlook Report." LCC and ECZ Lusaka-Zambia. Pg 55

areas where about 75 per cent of the population is living since almost no waste is collected from these areas.[48] This is well illustrated in the table below;

TABLE 3.7.1 ESTIMATED YEARLY QUANTITIES OF WASTE GENERATED IN LUSAKA AND ITS DENSITY (1996)

CATEGORY OF WASTE	ESTIMATED QUANTITIES (TONS/YEAR)	PERCENTAGE OF TOTAL QUANTITY	DENSITY (Kg/m3)
Domestic:			
High Density	169 143	69.50%	395
Medium Density	364 93	15.00%	309
Low Density	136 78	5.60%	447
Trade and Industry:			
Hotels	1 392	0.60%	277
Markets	11 783	4.80%	207
Industry, Commerce	5 559	2.30%	51(1)
Others:			
Hospitals	528 11	2.20%	Not analysed
Total	243 329	100%	

Source: ECZ, LCC and CIDA 1997. Solid Waste Management Plan Project for the City of Lusaka, phase 1 Diagnosis

[48] ECZ, **State of Environment in Zambia 2000,** ECZ, Lusaka – Zambia, (2001). Pg 104

Hence, various types of waste are generated from households, industry, trade and commercial enterprises and service institutions. The table below shows Waste Categories and their Constituents;

3.7.2. Table Showing Waste Categories and their Constituents.

CATEGORY	EXAMPLE
Paper and Card board	Newspaper, cardboard, tetra pack, office paper, tissues, coated paper, soap packets, etc.
Ferrous	Cans, containers, etc.
Non ferrous	Aluminium foil, beverage cans, bags, etc.
plastics	Food containers, plastic foil, bottles, plastic bags, etc.
Glass (Clear/Coloured)	Bottles, pots, etc.
Rags	Textiles, clothes, etc
Putrescibles	Fruit skins, vegetable peelings, miscellaneous, food refuse, bones, leaves, etc
Toxic Waste	Pesticides, expired chemicals and infectious wastes (medical waste)
Mine Waste	Tailings, waste rock, smelter slag and overburden dumps
Other Waste	Waste oil compounds containing heavy metals, wood, rubber, soil, leather, ashes, ceramics, sewer sludge, etc.

SOURCE: ECZ/LCC 1998, Lusaka Mater Plan.

Therefore, with regard to the above statistics on solid waste generation, it is imperative to state that all commercial and public facilities, industries and mines should develop a policy to minimize the generation of waste. Generators such as commercial, industrial, agriculture and institutional areas, should further put in place mechanisms to treat all hazardous waste generated. Considering the fact that there is currently a lot of packaging waste for example, plastic bottles as a result of the proliferation of the drink and beverage industry, legislation to this effect will be

very imperative in order to compel producers of products that ultimately end up in the environment as waste to take back such kind of waste or altogether change the packaging regime.[49]

Hence, in supporting efficient waste management, the Lusaka City Council has highlighted the Municipal Solid Waste Management By-laws of 2004 which compels all waste generators in Lusaka's residential areas, commercial outlets, institutions and industries to register with the respective waste management companies.

However, in an interview with the Lusaka City Council Public Relations Manager Chanda Makanta of 8th February, 2010, she admitted that the waste management system has not been as effective as it was intended to be. She said that it hasn't been as effective as expected, the reason being that members of the public do not appreciate it. Communities depend so much on the local authority, believing it is mandated to manage the waste alone. The council has so much work to do and it needs support from the people.

She further stated that the council devised the waste management system because it lacked support from the public and that the system was a way of getting everyone involved in waste management. Her wish and appeal was to companies such as the telecommunications companies which generate waste in form of used scratch cards and also to the bottling and opaque beer companies to come on board and help to address the problem of litter. She said that she would like to see companies such as MTN, Zain and Zamtel working hand in hand with the local authority towards their scratch cards which generate a lot of garbage and also not forgetting

[49] ECZ, **National Solid Waste Management Strategy for Zambia**, (2005), Pg 11

companies which manufacture opaque beer. Other companies in the city should also partner with the council in finding the solution to the problem of poor garbage disposal.

In support of her assertion of litter being thrown all over the city especially in high density areas after drinking opaque beer, Ndangwa Mwittah[50] reports that, "because of the high number of taverns, over 60 percent of the garbage in Misisi is generated from drinking places. The surroundings are littered with containers used to drink beer and empty packets of the opaque brews."

3.8 WASTE COLLECTION AND TRANSPORTATION

Collection of waste from where it is generated or stored is one of the priority areas in the current waste management system. Waste collection should be done according to license conditions, using the right mode of transport and proper methods of collection. However, investment in expanding the collection capacity must be accompanied by corresponding investment in safe disposal facilities, which include resource recovery and recycling plants to reduce the volume of waste to recover the value from discarded materials.[51]

Therefore, because of its huge population, Lusaka City generates more waste compared to other towns around the country. This has prompted the government through the Lusaka City Council

[50] Zambia Daily Mail, 22nd January, 2010. Pg 5
[51] ECZ, **National Solid Waste Management Strategy for Zambia,** (2005), Pg 12

(LCC) to device a waste management system using community enterprises and the re-launch of the keep Zambia Clean and Health Campaign.[52]

Thus, to implement an effective waste collection service in conventional housing and commercial areas, Lusaka City Council has established partnerships with private waste management companies. To facilitate the local authority's intervention, the council divided the city into twelve (12) waste management 'districts' and these are;

A. Barlestone, Matero and Lilanda
B. Emmasdale
C. Chudleigh, Kalundu, Olympia Park, Olympia Extension and Roma
D. Kamwala Commercial Area, Central Business District, Thorn Park and Villa Elizabetha
E. Longacres, Northmead and Rhodes Park
F. Chamba Valley and Chelstone
G. Avondale, Chainama and NRDC
H. Handsworth, Ibex Hill, Kabulonga, Sunningdale and Helen Kaunda
I. Arakan, Kabwata, Kamwala, Libala, Madras, Ridgeway and UTH
J. Chilenje, Nyumba Yanga, State House, Woodlands and Woodlands Extension
K. Heavy and Light Industrial Areas
L. Lilayi and Makeni. [53]

Among the private service providers and contract franchisers involved in garbage disposal in the capital city are; clean Fast, City Mop, Twin Care, Catron, G.L. Carriers and LCC's Waste Management Unit. [54]

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[52]LCC, **A Publication of Lusaka City Council Waste Management Unit,** (2006), Lusaka. Pg 3
[53]A Publication of Lusaka City Council Waste Management Unit, (2006), Lusaka. Pg 2

However, some contractors are mainly involved in cleaning drainages as well as sweeping the streets. According to the Lusaka City Council, a franchise contract provides a private waste collector with the sole right and obligation to collect and transport waste from all premises in a franchised waste management district. A franchise contractor is also responsible for setting and collecting waste fees depending on the locality of the service provided. Lastly, they determine the type of waste receptacles to use such as bags, bins or containers, subject to approval by LCC.[55]

On the other hand, in peri-urban areas, waste collection is conducted using different waste collection systems. In most areas waste is collected through large (15m3) containers picked up for emptying by the Waste Management Unit of the Lusaka City Council. In addition, Lusaka City Council has been encouraging the formation of Waste Management Committees to be responsible for the day to day management of the waste system in that area.[56]

3.9 WASTE DISPOSAL

Engineered Landfill sites as well as properly sited and constructed dumpsites are a pivotal component in a sound waste management system. It is important to note that despite active waste prevention and recycling, a residue will always remain which requires final disposal. Waste

[54] A Publication of Lusaka City Council Waste Management Unit, (2006), Lusaka. Pg 3
[55] Ibid Pg 4
[56] LCC and ECZ, "**Lusaka City State of Environment Outlook Report.**" LCC and ECZ Lusaka-Zambia. Pg 64

should therefore be disposed of in such a way as not to cause harm to the environment and mankind.[57]

It suffices therefore to state that Lusaka has no clearly established Hazardous Waste disposal mechanisms and facilities. Health Care Waste is generally disposed off through incinerators located at various clinics. However, these also are not up to standard in terms of emissions and require upgrading.

Although Lusaka has developed a Strategic Plan for Solid Waste Management, implementation depends on the local Authority's ability to raise needed financing through improved Solid Waste Management service delivery and partnerships with the private sector. Otherwise, as mentioned above, revenue generation is still low.[58]

The Chunga dumpsite on the outskirts of Lusaka is the only legalized modern dumpsite in Lusaka. According to Lusaka City Council, residents who are dumping garbage without paying the Waste Management Unit have been warned to desist from the retrogressive practice for instance through the Media. Once garbage has accumulated, it is compressed and leveled by graders as opposed to burning it. This is in line with the standards set by the Environmental Council of Zambia under the Environmental Protection and Pollution Control Act (EPPCA of 1990) which has been discouraging the use of refuse pits and burning of waste, even in backyards. However, the site has not been spared by scavengers who bring some of the garbage back to the townships. Thus, the Waste Management Unit is expected to restrict and keep

[57] ECZ, **National Solid Waste Management Strategy for Zambia,** (2005), Pg 13

[58] LCC and ECZ, "**Lusaka City State of Environment Outlook Report.**" LCC and ECZ Lusaka-Zambia. Pg 75

scavengers away from the dumpsite, otherwise the whole purpose of moving garbage to the site will be defeated. [59]

Furthermore, based on the Polluter Pay Principle, all waste generators, residents, commercial entities and institutions, shall pay for the collection and disposal of the waste they generate. As provided under section 70 of the Local Government Act. However, based on the affordability principle, the decision has been made to keep these fees below 1.5 percent of the disposable family income. As a result, the fees had to be differentiated for different areas within Lusaka. In the peri-urban areas, where 70per cent of Lusaka's population lives, fee levels were set at a maximum of ZMK5, 000 per house hold per month.[60]

Nevertheless, despite the little amount each house hold is required to pay monthly in peri-urban areas, solid waste management has continued being an eyesore for the city of Lusaka especially in high density areas. This has not spared the residents from the same areas to exposure of different diseases such as cholera. Every year during the rainy season Lusaka City has been recording cholera cases with a big number coming from the same prone areas such as Kanyama, Misis, Chawama, Mandevu, and many more other compounds.

Not only that, poor solid waste management has also led to blockage of drainages during the same rainy season as water can't flow and instead remains stagnant causing floods in the same compounds. Hence as a result many deaths have been recorded this year only for people who have died by drowning in flooded queries. Most of the drainages are blocked with plastics, bottles, cans and card boxes.

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[59] LCC, **A Publication 0f Lusaka City Council Waste Management Unit**, (2006), Lusaka. Pg 3

[60] LCC and ECZ, "**Lusaka City State of Environment Outlook Report**." LCC and ECZ Lusaka-Zambia. Pg 73

Thus, the effects of industrialization and unplanned settlements have brought harm to the government as it has to release funds for mitigation and the people/citizens at large. Take for instance the Kamwala Commercial area; the owners of the shops are not even very much concerned with solid waste. Their customers just throw away litter anyhow after removing their merchandise from the packages which they just leave along the corridors sometimes. In addition, as earlier alluded to, it may cause sickness and injuries such as gastro-enteritis, hepatitis A, cholera, typhoid and worms among others. It has been reported by ZNBC[61] that in Lusaka alone, 564 cases of cholera have been recorded in less than three weeks at various cholera centers with Matero center having 162 recorded cases by Thursday 18th March, 2010. Health Minister Kapembwa Simbao said that the fast rising cases of cholera in Lusaka is due to floods.

Nevertheless, one of the contributing factors to floods in Lusaka is solid waste. The refuse thrown in the drainage system blocks the flow of water which eventually causes flooding and consequent traffic blockages, road deterioration and property damage. The blockage of the drainage system in the city forces the government through the Disaster Management Unit to release funds to unblock the drainages year in and year out. This is indeed a cost burden on the government as it has to be done every year. Thus, most of these cases come form unplanned settlement areas such as Misisi, Kanyama, Chawama, Kuku, George and Matero.

[61] ZNBC Main News, 20th March, 2010.

CHAPTER FOUR

4.0 SOLID WASTE MANAGEMENT UNDER THE ZAMBIAN, SOUTH AFRICAN AND BOTSWANA LEGAL FRAME WORK COMPARED

The issue of Solid Waste Management is a global concern which needs quick attention. Thus, sustainable solid waste management is a strategy for achieving environmental quality in both the developed and the developing world.

4.1 SOLID WASTE MANAGEMENT IN BOTSWANA

Various waste streams are growing in volume and complexity as the economies of developing countries expand. Botswana as a developing country has not been left out from this global crises of Solid Waste Management although currently the major challenge the country is facing, is construction waste.

In Botswana, the control of the environmental impacts associated with construction waste is of increasing concern. While the implementation of environmental management has a direct contribution to environmental protection, it involves the allocation and investment of resources, thus presenting a profit- making challenge, particularly to contractors in the construction industry.[62]

[62] A. F. Urio and A.C Brent, **Journal of the South African Institution of Civil Engineering, Volume 48 No. 2**, (2006) Pg 18

Therefore, it has been observed that construction sites generate large amounts of materials waste and poor waste management leads to direct financial losses, poses a danger to the environment and hampers the national waste management efforts of Botswana.

As for Botswana, it is suggested that Waste reduction can be achieved by introducing Cleaner Production Mechanisms at the generation stage which I think is as well a good idea for Zambia since we are also facing a challenge in construction waste. Hence in 1993, the government of the Republic of Botswana established a Waste Management Project to address the growing waste dilemma in the country, which is attributable to the expanding economy and the increasing urban population.[63]

The project developed a waste management strategy, launched landfill guidelines and was responsible for the promulgation of the Waste Management Act of 1998. The Waste Management Strategy in Botswana addresses waste management in a broad perspective and embeds the key principles of waste prevention, payment by the polluter and cooperation among all the parties involved in the waste lifecycle. The broader perspective includes the hierarchy of Waste reduction (can quality of waste produced be minimized?), Reuse/Recycling (can waste be reused or recycled?); Waste treatment (does the hazardous nature of waste need to be reduced?) and finally, Safe disposal. These points are the foundation on which all other waste management tools are built.[64]

Therefore, the waste management process should be based on the current conditions as a starting point, and thereafter strive for progressive improvement of the situation in terms of (ILO-OSH 2001):

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[63] **Journal of the South African Institution of Civil Engineering, Volume 48 No. 2**, (2006) Pg 18
[64] Ibid Pg 20

- Minimizing and reducing wastes in industry, commerce and households;
- Maximizing waste reuse and recycling, and
- Promoting waste collection, treatment and disposal.

As a result, the waste streams which have been addressed include scrap metal, oil containing wastes, medical waste, packaging wastes, industrial wastes and tyre + and battery wastes.[65]

Furthermore, taking Francistown as an example, construction waste contributes a high percentage of waste received at the formal disposal sites. Therefore, specifically in the developing country context such as Botswana, Zambia, and many others, there should be a call for change in attitude towards material waste control and disposal of the unavoidable waste. Care and proper handling in the use of materials is thus essential and the need for materials control policies is thereby cardinal.

Finally, in view of the importance of waste prevention to the national economy of Botswana, the following general recommendations are made:

- Waste prevention clauses should be incorporated in the general conditions of contract for construction works. Which I think should be the same even in Zambia.
- Materials management and waste control should be included in the construction education curricula in the country. As for Zambia, this can be included under the TEVETA syllabus.

[65] **Journal of the South African Institution of Civil Engineering, Volume 48 No. 2,** (2006) Pg 18

- Professional bodies in the construction industry should organize workshops and seminars to educate contractors and members of the construction design team on the importance of waste prevention in the industry and the national economy at large.[66]

It has also been suggested that public environmental education and regulatory measures be strengthened in Botswana.

4.2 SOLID WASTE MANAGEMENT IN SOUTH AFRICA

The management of both general and hazardous waste is an environmental issue causing concern globally as well as in South Africa. Section 24 of South Africa's Bill of Rights[67] states that: "everyone has the right to an environment that is not harmful to their health and well-being." Therefore, unlike in Zambia where the Directive Principals provided for in the Constitution of Zambia are not justiciable, the South African Constitution allows citizens to take legal action against the local government to ensure these rights.[68] Thus, Solid Waste is being generated from residential, commercial, industrial and other streams. The City of Cape Town and Mpumalanga shall be used as examples under solid waste management in South Africa.

In 2002 and 2003, residents, visitors and business in Cape Town generated 2.3 million tons of waste. That's almost 2kg per person a day on average. It is stated that waste generation is growing at almost 7percent per annum faster than the city's population growth rate of 1.7percent.

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[66] **Journal of the South African Institution of Civil Engineering, Volume 48 No. 2**, (2006) Pg 22

[67] Constitution of the Republic of South Africa Act 108 of 1996

[68] International Solid Waste Association (ISWA) Industry as a partner for sustainable development, WASTE MANAGEMENT, U.K (2002) pg 40.

Out of the six landfills the city has, three are already closed and the remaining three are filling up fast.[69]

Since the adoption of the city's Integrated Waste Management (IWM) policy in May 2006, the solid waste management department now concentrates on preventing pollution and waste at source, instead of focusing on treating and disposing of waste once it has been generated. Note should be taken that most waste has economic value; thus, recycling and reuse creates economic activity and minimizes health, socio-economic and resource impacts, thereby reducing the amount of waste that ends up in expensive landfills in the municipal area. [70]

Nevertheless, people in Cape Town are already catching onto the practice of waste management and are producing less waste and recycling and reusing items. This follows the Solid Waste Management Department's main functions of waste collection, area cleaning and waste disposal.

Over the 2006 to 2007 financial year, 14percent of 'waste' was diverted from landfill sites and was recycled or reused instead. This includes anything from builders' rubble to glass, paper and plastic. The City has also developed a materials recycling facility at the transfer station in Athlone where waste is sorted and streamed in order to separate recyclables and organic waste from disposable waste component.[71]

Hence, there has been a shift in South Africa's waste management strategy from control to prevention (White Paper on Integrated Pollution and Waste Management for South Africa, RSA 2000) and this focus is emphasised by the fact that municipalities now have to prepare an

[69] http://www.CapeTown.gov.Za/en/Solid Waste/pages/default.aspx. 16th March, 2010.
[70] www.CapeTown.gov.Za/en/Solid Waste/pages/default.aspx. 16th March, 2010.
[71] www.CapeTown.gov.Za/en/Solid Waste/pages/default.aspx. 16th March, 2010.

Integrated Waste Management Plan (IWMP) as part of their operational strategies of their Integrated Development Plans (IDP).[72]

4.3 WASTE PRODUCTION AND DISPOSAL

Mpumalanga province contributes 9percent (3 831 000 cubic meters) to South Africa's general waste stream and has the third highest per capita waste generation, 1.37 cubic meters per person per year, which is higher than the national average.[73] The following indicators were used to reflect waste production and management:

- Total General Waste Produced per capita per year and
- Expenditure on Waste Management per capita per year [74]

There is currently sufficient landfill airspace in the province, although certain regions may experience shortfalls in the near future. The provincial total projected landfill lifespan is 27 years, which is assuming that some of the existing landfills can be upgraded to meet the DWAF minimum requirements for landfills. The escarpment, however, faces an immediate crisis with only 2 years of landfill lifespan remaining in the region. This is indicated through the Available Landfill Lifespan indicator.[75]

4.3 HAZARDOUS WASTE IN SOUTH AFRICA

[72] www.CapeTown.gov.Za/en/Solid Waste/pages/default.aspx. 16th March, 2010.

[73] **Department of Water Affairs and Forestry, 1998; Stats SA, (2002).**
[74] www.CapeTown.gov.Za/en/Solid Waste/pages/default.aspx. 16th March, 2010.
[75] www.CapeTown.gov.Za/en/Solid Waste/pages/default.aspx. 16th March, 2010.

Mpumalanga is the largest producer of hazardous waste in the country and is responsible for just over a third of all hazardous waste produced in South Africa, largely due to the fertilizer manufacturing sector. Of the 3 416 973 cubic meters of hazardous waste produced in Mpumalanga, less than 0.1% actually reaches a hazardous waste site, the remainder is disposed of on-site or in some other way. The Total hazardous Waste Produced per sector per year indicator is used to monitor this. [76]

4.3.1 HEALTH CARE WASTE IN SOUTH AFRICA, BOTSWANA AND ZAMBIA.

Health Care Waste is a mounting problem in South Africa, Botswana and Zambia as in many other countries. Over recent years there have been numerous press statements of medical waste being disposed of in an incorrect manner. The people that have been most effected by medical waste have been the poor disadvantaged members of society. The incineration of medical waste has also caused much concern. Numerous studies indicate that incinerators have been associated with a wide variety of health problems such as disrupting the body's hormonal, immune and reproductive systems, and have caused cancers.[77]

Previously, civil society in South Africa had not been given a platform to voice their concerns regarding the health impacts that health care waste and incineration has had on their quality of

[76] Department of Environment Affairs, (1992), **Hazardous Waste in South Africa Volume 5:** Impact Assessment, Edited by R.G Noble. CSIR: Pretoria
[77] Llewellyn Leonard, **Health Care Waste in South Africa Report**, (2009) Pg 4

life, and only recently has civil society taken a stand to state that "enough is enough", and have sort ways to voice their concerns in a legitimate manner[78]

Meantime, there is very little control over how medical waste is stored, handled and disposed off and sometimes dumped together with municipal garbage in municipal landfill sites. Since incinerators are present at most hospitals, there is no incentive to segregate the waste. Majority of the hospitals that have on-site incinerators for health care waste do not operate satisfactorily. The worst problems arise in small rural hospitals and clinics, which are unable to give the required special care in handling medical waste because of lack of resources.[79] This challenge affects all the three countries stated above.

Desktop studies show that 45% of health care waste generated in the province of KwaZulu-Natal alone cannot be accounted for, suggesting that it is being illegally dumped, buried or burnt somewhere, thus affecting the health of people and the environment. Wastes from health care facilities pose a risk to health care workers, patients and local communities. While there is much concern about the possible spread of disease (especially from contact with "sharps" such as needles), the treatment of those wastes, through incineration, releases an array of hazardous pollutants into the air and water, thus affecting the health of our communities. [80]

There is also the lack of capacity in South Africa to properly dispose of the large unnecessary amounts of health care waste being generated. There have been numerous instances where health

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[78] **Health Care Waste in South Africa Report,** (2009) Pg 5

[79] D. Thomas and others, **Environmental Management and awareness**, Northern Alberta Institute Technology, (1998), Canada. Pg 38

[80] Llewellyn Leonard, **Health Care Waste in South Africa Report**, (2009) Pg 6

care waste has been dumped in residential areas, thus posing a hazard to the community and environment. Due to illegal dumping in disadvantaged residential areas; there have been situations were children have been found playing with medical waste, i.e. children pricked with syringes, etc.[81]

At present, the Kwa Zulu Natal (KZN) Department of Health does not have one incinerator that meets the legal requirements for the disposal of medical waste due to government's failure to monitor and enforce laws governing incineration. For a long time civil society have lobbied government to stop incineration and implement non-thermal technologies. A Non Governmental Organisation (NGO) for Environmental Justice known as G*roundwork* had even resorted to taking government to court after numerous attempts to have the Ixopo incinerator shut down, since it was the largest incinerator in KZN and had been poorly managed. Audit reports had shown that the incinerator had failed to meet important health and safety conditions of its permit. These included exceeding emission levels prescribed, as well as failing to meet the required temperature to prevent the release of certain chemicals such as dioxins into the environment. The incinerator was also located in the middle of a primary dairy producing area in South Africa. [82]

Incinerators are dangerously polluting technologies that will virtually undermine the objectives of the Protocol on Persistent Organic Pollutant's Treaty. The Stockholm Convention on Persistent Organic Pollutant, which has been ratified by South Africa, identifies waste incinerators as the principle source of dioxins and furans, which belong to the initial 12 substances being targeted for continuing minimization and ultimate elimination by the global

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[81] Llewellyn Leonard, **Health Care Waste in South Africa Report,** (2009) Pg 7

[82] Ibid Pg 8

community. Government has targeted these 12 pollutants because they are extremely dangerous to human health. Recently, the KZN Department of Health took a policy decision to halt the incineration of medical waste in the province (The Mercury, 20 November 2002).

Instead the department will seek to treat and dispose of health care waste using environmentally safer, non-combustion technologies. As of last year, two first ever non-thermal treatments were set up in KZN, and a third is soon underway.[83]

As for Botswana, the ideal disposal for clinical waste is by incineration. Incineration performs two functions, thus, to sterilize the waste and to destroy it, leaving a relatively harmless ash as a residue which may then be safely landfilled.[84] This equally applies to Zambia.

Nonetheless, incinerators are now available which have suitable emission controls to reduce these harmful emissions to extremely low levels despite being expensive. Fortunately, the quantities of clinical wastes in Botswana by virtue of its relatively small population are small and the likely environmental impact of the emissions from clinical waste incinerators is correspondingly small, especially in view of the large land area and low population density.[85] This is not the exact situation in Zambia which has a large population especially in the City of Lusaka.

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[83] Llewellyn Leonard, **Health Care Waste in South Africa Report**, (2009) Pg 8

[84] The National Conservation Strategy (Co-coordinating) Agency and Germany Technical Cooperation, **Study on the Management of Medical Wastes**, Report No. NCS/GTZ 7/96, Botswana. Pg 90

[85] Study on the Management of Medical Wastes, Report No. NCS/GTZ 7/96, Botswana. Pg 90

CHAPTER FIVE

5.0 CONCLUSION

In conclusion, it has been observed that the critical issues for this sector of Solid Waste Management are waste generation, collection and disposal, institutional and infrastructural capacity for the management of waste in the city.

Therefore, from the foregoing, it has been observed that Lusaka has no clearly established Hazardous Waste disposal mechanisms and facilities. Health Care Waste is generally disposed off through incinerators located at various clinics. However, these also are not up to standard in terms of emissions and require upgrading.

Although, Lusaka has developed a Strategic Plan for Solid Waste Management, implementation depends on the Local Authority's ability to raise needed financing through improved Solid Waste Management service delivery and partnerships with the private sector as observed from the South African approach of NGOs such as the Environmental Justice Groundwork.

Furthermore, the private sector and Lusaka City Council need to establish the required customer base to make their operations financially viable. There is a significant risk that city dwellers choose not to use Solid Waste Management services especially if they consider it too expensive. Most people in Zambia have no environmental consciousness. Thus, significant public awareness and education campaigns should be encouraged to sensitize the citizens especially Lusaka residents on the benefits of the improved waste management system.

On the other hand, disposal facilities for other categories of Hazardous Waste do exist and it is not uncommon to find hazardous waste in the municipal waste stream. This does

not only pose danger to the environment but also to waste handlers as well. Hence, there is need to put in place mechanisms of upgrading the Chunga Engineered Sanitary Landfill from a Municipal Landfill to include Hazardous Waste Landfill disposal cells. Although the best approach would be building another legal dump site for the fast growing Lusaka City than waiting for the current legal Chunga dump site to get filled up to its capacity.

Furthermore, the Lusaka City Council and the Environmental Council of Zambia need to enforce improved waste disposal practices that will minimize the extent of illegal waste disposal, which continues to pollute the environment and potentially lead to insufficient income from disposal fees to maintain operations. It therefore suffices to state that as can be observed, matters of sustainability of the entire waste management system need to be given extra attention. Thus, the suggestion for the following recommendations;

5.1 RECOMMENDATIONS

It is accepted that despite the broader legal framework provided within the Environmental Protection and Pollution Control Act (EPPCA) on Solid Waste Management, much needs to be done in order to achieve an effective legal frame work on Solid Waste Management. First of all, there is need to improve institutional capacity of the local authority to effectively manage waste in the City. Ensure Private sector access to affordable financing to invest in waste collection equipment unlike it is at the moment were our means of transport for waste is not up to the required standards such as not being covered hence leaving behind bad smell on its way to the dump site. Public awareness should be encouraged through Community Liaison and News Media. Also, there is need to

strengthen knowledge transfer between Waste Management Unity Staff from the local authority and Franchise contractors from the Private sector as well as providing curricular development for specific formal training in waste management. The issue of vehicles transporting Solid Waste should also be taken care of in the regulations as the vehicles which are currently used do meet the standards.

There should also be facilitation of establishment of waste recovery and recycling facilities to reduce waste at the disposal site and ensure value addition to waste through material recovery. This is what has led to the improvement of solid waste management in South Africa. Thus, there is need of attracting more investors in the industry of recovery and recycling of solid waste. Although, I think moving away from the three Rs of Reduce, Reuse and Recycle would be the best and instead promote prevention measures. Development of relevant regulations for health care waste is also another cardinal issue to be looked into.

Lastly, there is need of strengthening the enforcement of both the Environmental Protection and Pollution Control Act (EPPCA) of 1990, amended in 1999 and the By-Laws. For instance, under the By-Laws of the City of Cape Town, there are some sections which we can as well incorporate in our local By-Laws if they are to be effective and enforceable. Some of these are;

Section 12(1) of the City of Cape Town, Integrated Waste Management By-Law of 2009, provide that, any holder of waste who stores or transports waste must ensure that-

(b) Suitable measures are in place to prevent accidental spillage or leakage

(f) Hazardous waste is sealed in an impervious container and suitable measures are in place to prevent tampering.

Also section 15(1) provide that, no person may drop, throw, deposit, spill, dump, store or in any other way discard, any litter or waste into or onto any public place, municipal drain, land, stream, water course, street, road, wetland, coastline, or any place to which the public has access, or otherwise dispose of it nor may they allow a person under their control to do so.

Finally, section 23 (1) provide that, a person who contravenes sections 12(b), 12(f) and 15(1) shall be guilty of an offence and shall on conviction be liable for-

(a) Littering or dumping under $1m^3$ to over $8m^3$ of waste or hazardous waste and be charged the fine of ranging from R500 to R2 500;

(b) Spillage or leakage under $1m^3$ to over $8m^3$ of waste without putting in place suitable measures and be charged the fine ranging from R500 to R2 500;

(c) Conveying of an uncovered load of hazardous waste of any volume;

(d) Conveying of an uncovered or unsecured load which results in spillage under $1m^3$ to over $8m^3$ of waste or hazardous waste and be charged the fine of ranging from R500 to R2 500;

Such fine or imprisonment as the court may deem appropriate and the court may in addition order the removal of such waste or determine what measures must be taken by such person and the payment of the expenses incurred in respect thereof or any other cost or damages.

This should be the Zambian approach as well because currently the Citizens just throw litter and dump it any where because they know that there are no stiff laws put in place to deter the offenders. Hence, as a result, our public places such as streets, markets, roads, etc are full of uncollected garbage/litter. Indeed, enforcement requires special attention since it is always the weakest point in environmental control. Therefore, Solid Waste Management Regulations should

be few in number, transparent, unambiguous, easily understood (e.g. be translated into local languages as it is in South Africa), equitable and considered to have significant positive physical and economic effects. The keep Lusaka clean campaign should not be politicized. We should maintain keeping Lusaka clean as it used to be in the past so that we can overcome the belief that, "Lusaka once called a Garden City is now a Garbage City."

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