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SCHOOL OF LAW

**NAVIGATING THE ENVIRONMENTAL LEGAL AND REGULATORY CHALLENGES
OF SEWERAGE SYSTEMS IN ZAMBIA: A COMPARATIVE STUDY WITH
ZIMBABWE**

By:

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LLB22112557

**An obligatory essay submitted to the University of Lusaka in partial fulfillment of
the requirement for the award of the Bachelor of Laws (LLB) Degree.**

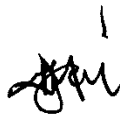
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DECLARATION

I **MARTHA NYONI**, do hereby declare that this dissertation titled “**NAVIGATING THE ENVIRONMENTAL LEGAL AND REGULATORY CHALLENGES OF SEWERAGE SYSTEMS IN ZAMBIA: A COMPARATIVE STUDY WITH ZIMBABWE**” which is hereby submitted to the University of Lusaka, School of Law as part of the requirements for the award of the Bachelor of Laws (LLB) degree, is my original work and has not previously been submitted for the award of a degree at this or any other institution.

I understand what plagiarism entails and I am aware of the University’s policy in this regard. Thus, the sources that I have used or quoted have been indicated and duly acknowledged as complete reference.

MARTHA NYONI



SIGNATURE.....

2025

SUPERVISOR'S RECOMMENDATION

I MR K.G.M CHISANGA recommend that this dissertation prepared under my supervision by **MARTHA NYONI**, entitled **NAVIGATING THE ENVIRONMENTAL LEGAL AND REGULATORY CHALLENGES OF SEWERAGE SYSTEMS IN ZAMBIA: A COMPARATIVE STUDY WITH ZIMBABWE** be accepted for examination. I have checked it carefully and I am satisfied that it fulfills the requirement pertaining to format laid down in regulations governing directed research.

A handwritten signature in black ink, appearing to be 'K.G.M. Chisanga', written in a cursive, flowing style.

SIGNATURE:

DEDICATION

This dissertation is dedicated to God for without him nothing is possible and I also dedicate it to my parents whose unwavering support and love have been my constant strength and sacrifices made towards to the fulfillment made to make this opportunity possible. Thank you for all the encouragements that made me to keep pushing and not give up.

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STATUTES

Environmental Management Act 12 of 2011)

Rio declaration on environment and development (1992)

Environmental Protection and Pollution Control Act (1990)

ACRONYMS

EMA: Environmental Management Act

EPPA: Environmental Protection and Pollution Control Act

IWW: industrial wastewater management

NWASCO: National Water Supply and Sanitation Council

OSS: On Site Sanitation

FSM: Faecal sludge Management

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ABSTRACT

This thesis was focused on the legal and regulatory challenges of sewerage systems in Zambia by doing a comparative study with Zimbabwe. The purpose of this study was to address the challenges faced with sewers In spite of some laws enacted and also addressing accountability of sewerage system law challenges. The objectives of this thesis addressed the laws and challenges faced in Zambia and Zimbabwe by bringing out laws and existing negative effects of sewerage systems on the environment. Further they addressed reforms and best practices performed by other countries.

The thesis also addressed the negative impact caused by sewerage systems in Zambia due to lack of abiding by the laws and also in spite of abiding by the existing laws. It also addressed ways in which other countries are working on their laws and frameworks in order to address and minimize challenges arising from sewerage systems.

The dissertation further gave recommendations on how Zambia can improve its sewerage systems in order to help with the proper maintenance and management of sewerage systems and contribute to the well being and sustainable development of the environment.

CHAPTER ONE

NAVIGATING THE ENVIRONMENTAL LEGAL AND REGULATORY CHALLENGES OF SEWERAGE SYSTEMS IN ZAMBIA: A COMPARATIVE STUDY WITH ZIMBABWE

1.0 INTRODUCTION

A sewerage system, or wastewater collection system, is a network of pipes, pumping stations and appurtenances that convey sewage from its point of origin to a point of treatment and disposal. A sewer system, also called a sanitation system, is the infrastructure that's designed to collect and dispose of storm water and wastewater, thereby preventing stagnation and flooding. They are essential to maintaining healthiness and hydrological balance.¹

In Zambia, however, the development and regulation of sewerage systems faces legal, institutional and environmental challenges. These include outdated legislation, inadequate enforcement mechanisms, growing impact of urbanization and climate change. Poor management or lack of proper care of sewage systems can lead to difficulties in maintaining public health and environmental sustainability in urban areas. The consequences of these challenges are evident in frequent sewage overflows, water contamination and related health risks, particularly in densely populated urban areas.

Both Zambia and Zimbabwe face significant challenges in this regard, with aging infrastructure, inadequate funding, and regulatory complexities exacerbating the situation. In Zambia, the strain on existing sewage systems is evident, particularly in rapidly growing towns like Chirundu, where the capacity of waste stabilization ponds has been exceeded, leading to environmental and health risks.² As for Zimbabwe, issues such as burst sewage pipes and outdated systems have resulted in health crises, including cholera outbreaks³.

¹ What is a sewer system at <https://www.ferrovial.com> accessed on 9th April 2025

² <https://www.sadc.int/file/4431/download?token=sO5qhOA>

³ The problem of burst sewage pipes and sewage outflows in east view suburb in kadoma city, Zimbabwe at https://jsd-africa.com/Jsda/V11N01_summer2009/PDF/The%20problemBurstSewagepipeSewrageOutflows.pdf accessed on 10th April 2025

Evidence continues to show for example the sewer system in some parts of Chunga Township in Lusaka as from 2015⁴. And just recently in 2024 the Lusaka City council had to suspend operations at Royal Park platinum over unsanitary conditions due collapsed sewer systems resulting in discharge of effluent into open environment.⁵

1.1 BACKGROUND OF THE STUDY

Sewerage systems in Zambia are characterized by early infrastructure development followed by periods of underinvestment and neglect, culminating in the current need for improved sanitation and wastewater management.

Zambia inherited limited sanitation infrastructure at independence in 1964, with urban areas relying on stabilization ponds and outdated systems from colonial era. Rapid urbanization, especially in Peri-urban areas, led to increased human waste production, overwhelming existing sewerage systems. Sewerage systems in Zambia began with aqua privy systems in the late 1950s and early 1960s, primarily targeting low-cost, high-density housing. However, these systems faced challenges in technical performance and social acceptability.

During the post independence, efforts were made in improving water supply sanitation which introduced piped water supplies and hygiene education. In the 1990s institutional reforms were formed such as the **Water Supply and Sanitation Act of 1997** which established commercial utility companies to replace fragmented local governments services. These utilities were tasked with urban water and sanitation provision. **The national water supply and sanitation council (NWASCO)** was later established as a regulatory body to oversee performance of commercial utilities and enforce standards.

Despite reforms, urban sewerage coverage remained limited, with rural areas relying on alternative solutions like shallow wells or NGO interventions. In urban areas due to rapid urbanization, it led to outpaced sanitation infrastructure development. Informal settlements also lacked adequate sewerage systems.

⁴ Thandiwe Moyo, The Times of Zambia (Ndola) 21 November 2015

⁵ Augustine Sichula, Mwamba, Lusaka City Council suspends operations at royal park platinum July 10, 2024

Zambia's sewerage management has evolved from colonial-era to commercially run utilities under regulatory oversight. However serious challenges remain in terms of equitable access, maintenance, treatment capacity and sanitation.

1.2 STATEMENT OF THE PROBLEM

The Zambian sewerage system continues to pose as a negative effect on the environment hindering effective sanitation and environmental protection. These challenges stem from both regulatory and existing laws.

S.47 of the Environmental Management Act states that an owner or operator of a trade or industrial undertaking who wishes to discharge into an existing sewerage system effluent from their plant shall obtain written permission to do so from the local authority operating or supervising the sewerage systems⁶, Similarly as provided for under **S.26 of the Environmental Protection and Pollution Control Act**.⁷ Henceforth, allowing for the discharge of effluents in existing sewerage systems, as a result posing regulatory and implantation challenges in that the permission can even be granted in a situation where license holders discharge in already full systems causing an overflow or burst of these old infrastructure. The EMA and the Water pollution control regulation focus on effluent discharge but may not fully address the comprehensive management of sewerage systems, particularly in rural or Peri - urban areas. As most of the challenges are due to old and poorly maintained sewerage systems and insufficient funds to rehabilitate or remediate old infrastructure especially in urban areas like Lusaka.

Most of households in Lusaka's urban areas use pit latrines which are unimproved and do not meet sanitation standards, leading to potential contamination of groundwater and surface water. In densely populated areas, such as Missi and Kanyama, there are also isolated cases of open defecation.⁸ The law allowing for the discharge of effluents, also poses questions on who is to be held accountable for the effects of these sewerage systems that are contributing to environmental concerns.

⁶ Section 47 of the Environment Management Act No.12 of 2011 chapter 87 of the Laws of Zambia

⁷ Section 26 of the Environmental Protection and Pollution Chapter 204 of the Laws of Zambia

⁸ African Development Bank Group at <https://www.afdb.org> accessed on 10 April 2025

Zimbabwe facing similar issues such as burst sewage pipes and outdated sewerage systems⁹, it has adopted a more structured approach integrating strict compliance measures under its **Environment Management Act [chapter 20:27]** and implemented a decentralized approach to sewerage systems, allowing for more localized enforcement and infrastructure. This dissertation aims to navigate the environmental legal and regulatory challenges of sewage systems in Zambia through a comparative study, exploring potential solutions and policy reforms to improve sanitation services.

1.3 RESEARCH OBJECTIVES

1. To conduct a comprehensive comparative analysis of the legal and regulatory frameworks governing sewerage systems in Zambia and Zimbabwe.
2. To assess the environmental impacts of current sewerage practices in both Zambia and Zimbabwe.
3. To identify best practices and potential reforms that could enhance the environmental sustainability of sewerage systems

1.4 RESEARCH QUESTIONS

1. What specific laws are in place to manage and control the environmental impact of sewerage systems in Zambia and Zimbabwe?
2. To what extent are these legal and regulatory provisions effectively enforced?
3. How are other countries internationally dealing with issues related to sewerage systems?

⁹ The problem of burst sewage pipes and sewage outflows in east view suburb in Kadoma city, Zimbabwe at https://jsd-africa.com/Jsda/V11N01_summer2009/PDF/The%20problemBurstSewagepipeSewrageOutflows.pdf accessed on 10th April 2025

1.5 SIGNIFICANCE OF THE STUDY

The study is important as it would contribute to ensuring sustainable development, protecting natural resources and fostering compliance with environmental laws. Studying the environmental legal and regulatory challenges of sewerage systems is essential for public health protection and legal accountability such as in court decisions, allowing legal action against water companies for sewerage systems and holding polluters accountable. Understanding how Zambia and Zimbabwe address issues with sewerage systems, this research would help address specific challenges faced.

In addressing these specific challenges it would help in pollution control as poorly designed or maintained systems can lead to the discharge of untreated or partially treated sewage into rivers, lakes and oceans causing water pollution and harming aquatic ecosystems. It would also help in identifying weaknesses that could put communities at risk of contracting waterborne diseases like cholera especially in densely populated areas. This is crucial for public health, environmental protection, community well-being and economic development.

The study is significant as it would also help assess ecological risks and designing climate-resilient systems that can cope with extreme weather events. Environmental studies of sewerage systems from data collected would help policymakers to design effective regulations, prioritize investments, and implement sound waste management practices.

1.6 SCOPE OF THE STUDY

The scope of the study will be confined to the Republic of Zambia, Zimbabwe and other international laws. This will be in relation to how each Country approach the legal and regulatory challenges of sewerage systems.

1.8 DEFINITION OF KEY TERMS

1.8.0 Peri-urban: Traditional definition of peri-urban are tied proximity to urban areas. Areas that are located on the outskirts of cities or large urban areas but retain rural characteristics such as substantial reliance on agricultural production.¹⁰ Peri-urban

¹⁰ Defining urban contexts- World Vision International at <https://www.wvi.org> accessed on 11th APRIL 2025.

(especially in Africa) denoting or located in an area immediately adjacent to a city or urban area.

1.8.1 Sewerage Systems: refers to the infrastructure which conveys sewage or surface runoff using sewers. A sewerage system is a pipeline network, pumps and power to force the collection of waste waters, or sewage from the community.¹¹

1.8.2 EMA: Environmental Management Act

1.8.3 EPPA: Environmental Protection and Pollution Control Act

1.8.4 IWW: industrial wastewater management

2.0 LITERATURE REVIEW

According to **Sonile Mutafye** an effective industrial wastewater management strategy is necessary to promote and improve industrial wastewater management (IWW) and determine priorities pertaining to the enforcement of applicable legislation, monitoring and engagement with industries. That it is oblivious to the fact that both water supply and IWW management are essential and interrelated. Wastewater from industries and sewage spillages from burst pipes in most centers, including Zambia's capital city Lusaka are released into streams and wetlands.¹² My research is centered on waste negative impact on the environment including from industries and sewage spillages.

Chola Kasoma Mbilima opines that **NWASCO (National Water Supply and Sanitation)** due to inadequate regulation of non-sewered sanitation it had to develop new frameworks for regulating onsite sanitation (OSS) and faecal sludge management (FSM) starting in 2016, as traditional sewer systems serve only a minority. Further stated that existing legislation and standards for OSS and FSM are insufficient, and enforcement of water

¹¹ All About Of Sewerage System at <https://www.civilcoops.com> accessed on 11th April 2025.

¹² Sonile Mutafye, NutaReS Advisor Zambia, Adelaide Mkwawa, NatuReS junior Advisor Tanzania (Intercountry learning on Industrial Wastewater Management between Tanzania and Zambia) June 23, 2022

and sanitation standards is weak.¹³ This thesis will address the insufficiency and enforcement of existing and a lack of specific laws.

Ruth Kennedy-Walker, Jaime M Amezaga and Charlotte A Paterson opines that while a legal and regulatory framework exists for sanitation service delivery in Lusaka, the unclear or non-existent regulation along with lack of legislation related to the safe management of faecal sludge and resource recovery have contributed to poor sanitation.¹⁴ Similarly my research will focus on the same problem.

Mangizo R.V.¹⁵ stated that increase in population, old age of sewer systems, vandalism, and disposal of solids into the system resulted in bursting of pipes and outflows of raw sewage. Lack of funds, inflation and inept operations of Zimbabwe Water Authority worsened the sanitation. It was recommended that regulations should be followed as well as having civic education for residents of East view.

Ejovwokeoghene Joseph Omohowovo opined on the importance of public health stating that wastewater treatment plays a crucial role in safeguarding the environment, public health, aquatic organisms and water resources, reducing environmental impact and adhering to regulations. That however , the current methods for treating wastewater in Africa fall short of these goals resulting in substantially poor environmental and health outcomes and inadequate provision of safe water and essential sanitation.¹⁶ Similarly my research will focus on the same problem.

Moses Musanshi¹⁷ criticizes the Environmental Management Act (EMA) No.12 of 2011 stating that it is the principle Act that provide for water pollution control in Zambia.

¹³ Chola Kasoma Mbilima , Regulation as a means to ensuring CWIS in Zambia at <https://iwa-network.org> accessed on 13th April 2025

¹⁴ Ruth Kennedy-Walker, Jaime M Amezaga, and Charlotte A Paterson , The role of power, politics and history in achieving sanitation service provision in informal urban environments: a case study of Lusaka, Zambia, May 22, 2015

¹⁵ Mangizvo R.V, Journal of Sustainable Development I Africa (volume 11, No.1,2009). The problem of burst sewage pipes and sewerage outflows in East view suburb in Kadoma city, Zimbabwe

¹⁶ Ejovwokeoghene Joseph Omohwovo, Wastewater Management in Africa: challenges and recommendations, October9, 2024.

¹⁷ Moses Musanshi, How effective are the Zambian pretreatment regulations and enforcement mechanisms for industrial wastewater discharges into sewer systems, 15 December 2024

However, wastewater that is discharged from facilities into the aquatic environment is regulated under the Act by a permit which regulates the quality of effluent using specific parameters.

Stating that industries that discharge into the sewer systems are exempted from this requirement and their discharges is regarded as municipal wastewater which is treated at wastewater treatment plant who bares the cost for the pollution under the polluter pays principle and if the precautionary principle is applied, what measures are in place to ensure the pollution load entering the sewer system is minimal and cannot affect the operating conditions. This thesis will address this problem in relation and if need for more laws been enacted.

Narendra Kumar Maurya is of the view that in order to lessen the negative effects of wastewater discharges in Zambia, more enforcement, monitoring and improved regulatory frameworks are required.¹⁸ My research aims to investigate on how the existing laws can be improved in order to mitigate the challenges being faced.

Tamaka Mrewa opines that burst pipes have become a frequent problem across Zimbabwe, particularly in Bulawayo where residents face heightened risks of waterborne diseases.¹⁹ As a result of the problem, it is contributing to environmental degradation.

Blessings Chidakwa²⁰ opined on the effect of discharging raw sewage on the environment which were as a result created serious health and environmental hazards. This occurred due to Harare city council discharging raw sewage into the Mukuvisi River, which flows into Lake Chivero, the city's main water source. My research will investigate on the effectiveness of the existing laws and if need to strengthen them.

Abdul Aziz Meslat stated that internationally, the effectiveness of international treaties and agreements is often hindered by issues of non-compliance and inadequate enforcement mechanisms. Additionally the global nature of environmental challenges necessitates enhanced cooperation and coordination among nations.

¹⁸ Industries that discharges into the sewer systems at <https://www.researchgate.net>

¹⁹ Tamaka Mrewa, Raw sewage crisis in Bulawayo: Residents fear borehole contamination, 14th October 2024.

²⁰ Blessings Chidakwa, Zimbabwe: council pumps Raw Sewage into lake Chivero 19th December 2024

That to address these challenges, it is crucial to prioritize collaboration between nations and strengthen the enforcement capacity of environmental agencies at both national and international levels.²¹ My research is with regards to the negative impact of inadequate enforcement mechanisms and non-compliance.

Officer for Environmental Protection (OEP) after investigations into the regulation of CSOS (Combined Sewer Overflows) identified possible failures to comply with environmental law in relation to regulatory oversight of untreated sewage discharges. The aim of the investigation was to clarify the roles and responsibilities of public authorities.²² That overflows and industrial discharges often exceed permitted limits due to insufficient monitoring. My research is in line with the roles and responsibilities of public authorities specifically with sewerage systems and failure in complying with the laws relating to environmental protection.

3.0 METHODOLOGY

3.1 RESEARCH APPROACH

The qualitative approach will be used in the study as it focuses on understanding and interpreting the subjective experiences. It answers the how and whys instead of how much and gathers participants' perceptions and behaviour.²³ This approach will be favourable in understanding each individual's views with regards to the study.

3.2 RESEARCH DESIGN

The research will be comparative case study design as it allows an in-depth exploration of environmental legal and regulatory frameworks governing both Zambia and Zimbabwe, comparing how each country navigates these challenges. The case study will facilitate detailed examination of policies, implementation practices and stakeholder experiences within their real-life contexts.

²¹ Abdul Aziz Meslat, U.S International Environmental Law A comparative Analysis, October 8, 2024

²² Office for Environmental Protection possible failures to comply with environmental laws, 12 September 2023

²³ NCBI at <https://www.ncbi.nlm.nih.gov>

By comparing the two countries the study will assess the similarities and differences in environmental legislation, regulatory institutions, policy frameworks and enforcement mechanisms.

4.0 DATA ANALYSIS

The data will be analysed using thematic analysis using the following;

Document analysis: by analyzing legal texts such as environmental Management Acts, Public Health Acts and local government statutes. These will be analysed to extract relevant legal provisions and institutional mandates including case law from both jurisdictions will be examined to determine how courts have interpreted sewerage related environmental challenges.

Interviews: semi-structured interviews will be conducted with environmental experts and individuals in a community.

Interpretation: findings will be interpreted in light with environmental law principles such as the polluter pays principle, precautionary principle and sustainable development.

4.1 DATA COLLECTION

1.1.1 Primary Data

Data will be collected through interviewing different people, from which the researcher will gather specific information with regards to the research.

1.1.2 Secondary Data

Secondary data collection will be used in collecting data from various sources such as Articles, Journals, Books and Websites.

4.2 ETHICAL CONSIDERATIONS

The researcher will complete the research putting into consideration necessary ethics and will ensure the information obtained during the research from other peoples' work be referenced as to acknowledge their work.

CHAPTER TWO

A COMPARATIVE ANALYSIS OF THE LEGAL AND REGULATORY FRAMEWORKS GOVERNING SEWERAGE SYSTEMS IN ZAMBIA AND ZIMBABWE

2.0 INTRODUCTION

The management of sewerage systems is made possible with the representation of legal and regulatory frameworks. These frameworks are provided for to make sure that what is supposed to be done is done in line with the required format. Having good sewerage systems contribute to better sustainable development and the environment is kept healthy for both animals and humans.

The chapter is going to explore both legal and regulatory frameworks governing sewerage systems in Zambia and Zimbabwe such as the Environmental management Act, National Water Supply and Sanitation Council (NWASCO), and the Environmental Protection and Pollution Control Act. While for Zimbabwe will explore their Environmental Management [chapter 20:27], by- laws and their Statutory Laws.

2.1 OVERVIEW OF SEWERAGE SYSTEMS IN ZAMBIA

Zambia sewerage system consists of two types; off-site sanitation (waterborne sewerage system) and the on-site sanitation (which majority of residents rely on due to unplanned areas where centralized sewer systems are not accessible). Zambia has had reports with water being contaminated by sewers which are sometimes due to overflows²⁴ and some areas use pit latrines which are unimproved and do not meet sanitation standards leading to contamination of groundwater.

According to Lusaka Water Supply and Sanitation as of December, 2019 the total sewer network is about 524km representing 16% for reticulated sewer. To scale up on sanitation access, Lusaka Water Supply and Sanitation has integrated on-site sanitation (OSS) services and faecal sludge management (FSM) starting off with areas that will not be sewerred in medium to long-term due to technical and socio-economic

²⁴ Sewerage overflow caused water contamination-NWASCO Geoffrey Zulu, 19th January 2019

considerations.²⁵ And it is for this reason that many areas especially Peri-urban zones rely on on-site sanitation like pit latrines which are often poorly maintained and can contaminate water sources

2.2 LEGAL AND REGULATORY FRAMEWORKS IN ZAMBIA

The environmental legal and regulatory frameworks for sewerage systems in Zambia are anchored primarily in several key laws and regulations. In effect, Zambia's sewerage system regulations establish a framework for licensing, effluent quality control, pollution prevention, treatment requirements and enforcement managed mainly by ZEMA and National Water and Sanitation Supply (NWASCO), with local authorities playing a key role.

However, the country recognizes gaps in onsite sanitation and fecal sludge management regulation.²⁶ The **Environmental Management Act, 2011** is an Act that was enacted to continue the existence of the environmental Council and re-name it as the Zambia Environmental Management Agency to provide the well being of the environment among others is prevention and control of pollution and environmental degradation.²⁷

Section 47 of the Environmental Management Act²⁸ gives permission to discharge effluent into sewerage systems however the laws intention and its practical application due to inadequate enforcement and monitoring would lead to a negative effect on the environment. The presence of section 47 assumes that the sewerage systems themselves are capable of handling the types and volumes of waste they receive when however, Zambia, infrastructure is often old, degraded and hydraulically overloaded.

Section 47(2)²⁹ of the Environmental Management Act No.12 of 2011 provides that the local authority operating or supervising a sewerage system may in contravention impose conditions under which effluent may be accepted prior to the acceptance of the license. Generally the Act with regards to sewerage management is not clear on who is to

²⁵ Lusaka Water Supply and Sanitation –LWSC <https://lwsc.com.zm>

²⁶ <https://cdn.who.int/media/docs/default-source/wash-documents/zambia-sanitation-policy-and-planning-case-study-for-discussions.pdf?>

²⁷ Environmental Management Act No.12

²⁸ Section 47 of the Environmental Management Act 2011 (Act No.12 of 2011)

²⁹ Section 47(2) of the Environmental management Act No.12 of 2011

hold liable for the bursting sewerage systems between the one granting permission to discharge without conducting a proper research on the state of the sewerage systems infrastructure or the license holder who actually disposes of the waste.

This aligns with the environmental principle of the **Polluter Pays Principle³⁰ (PPP)** provided for under **the Rio Declaration on Environment and Development** annexed as principle 16 which requires the polluter to bear the cost of pollution , with due regard to the public interest to the public interest and without distorting international trade and investment.

Recent developments indicate progress toward closing these gaps through new regulatory frameworks and guidelines targeting rural and urban onsite sanitation, but implementation remains a work in progress. An example is the National Water Supply and Sanitation Council (**NWASCO**) which embarked on the journey for the development of sanitation; faecal sludge management and development of statutory instrument of onsite sanitation and by-laws for Lusaka City for enforcement of non sewer sanitation service provision that arose from disposal of human excrete, including collection and treatment.³¹

The Environmental Protection and Pollution Control Act³² was enacted to provide for the protection of the environment and the control of pollution; to establish the Environmental Council and to prescribe the functions and powers of the council and to provide for matters connected with or incidental to the forgoing.

The Act is aimed to create a comprehensive legal framework to combat pollution, manage waste effectively and ensure that businesses and individuals take responsibility for their environmental impact.³³ It is only right that everyone complies with the law in the manner that regulatory frameworks perform their duties and responsibilities in accordance and help each individual with the importance of environmental protection hence promoting sustainable development.

³⁰ Rio declaration on environment and development (1992)

³¹ Regulation as a means to ensuring CWIS in Zambia by Chola Kasoma Mbilima <https://iwa-network.org> accessed on 31st july 2025.

³² Environmental Protection and Pollution Control Act (1990)

³³ <https://www.astutis.com>

In summary, Zambia's sanitation legal gaps mainly stem from limited scope of the 1997 sanitation law focused on water and sewer sanitation, the absence of explicit sanitation rights in the constitution, institutional coordination challenges and a lag in regulation and enforcement capacity for onsite sanitation and fecal sludge management.

2.3 OVERVIEW OF SEWERAGE SYSTEMS IN ZIMBABWE

Zimbabwe is facing a major environmental crisis as unprecedented sewage pollution is damaging its natural balance, putting the health of people and wildlife at risk. Nearly every water source has been polluted and many rivers are badly contaminated. Years of raw sewage dumping have severely damaged these waterways, choking them with hyacinth growth.³⁴

One of the biggest threats lake Chivero is pollution from sewage effluent, industrial and domestic waste as well as fertilizer and pesticide runoff from farms. The result is a loss of 20% the lakes' storage capacity. Research has found that there is highly contaminated because it receives raw and insufficiently treated sewage, most likely containing antibiotic residues.³⁵

The challenges faced with sewerage systems, does not only arise from discharge of effluents. Residents of Zimbabwe cities say that outdated, overflowing sewer systems dirty the streets, contaminate the water supply and threaten their health³⁶.The insufficient treatment capacity are equally the cause, as existing wastewater treatment works are often insufficient to supply the demand and adequately treat the volume of sewage generated.

This leads to heavy pollution of major water sources, such as Lake Chivero and Mukuvusi River with visible solid and liquid waste and untreated sewage. The release of raw waste not only creates foul odors and aesthetic degradation but also poses serious threats to surrounding vegetation, aquatic life and public health.

³⁴ Zimbabwe's environmental ecosystem sinks in sewage pollution Tadios Sokomondo Denya. February 06, 2025 <https://www.developmentaid.org>

³⁵ Pollution Threatens A Zimbabwean Towns' Waters and its Way of Life, Linda Mujuru, (Lilian Aluanga-Delvaux) Global Press <https://www.globalpressjournal.com>

³⁶ Outdated Sewer System Pollutes Zimbabwe, Threatens Health by Gertrude pswarayi October1, 2012

2.4 LEGAL AND REGULATORY FRAMEWORKS IN ZIMBABWE

Environmental Management Act (chapter 20:27) provides for the sustainable management of natural resources and protection of the environment; prevention of pollution and environmental degradation; preparation of National Environmental plan and other plans for the management and protection of the environment.³⁷

Section 4³⁸ outlines the principles of environmental management and functions of the minister, specifically in section 4(1) on how every person has a right to a clean environment and the prevention of pollution. **Section 4(2)**³⁹ states that the environmental principles shall apply to the actions of all persons and all government agencies, where those actions significantly affect the environment.

The Act is emphasizing on the importance of protecting the environment in order to promote sustainable development and in this manner every individual who would be liable in mismanaging sewerage systems can be held responsible for causing harm to the environment.

Statutory Instrument 390 of 1980⁴⁰ section 4 provides for the applications and discharges of trade effluent and further in **section 9**⁴¹ grants permission to discharge of that effluents. The Zimbabwean governments have made by laws specifically to deal with sewerage and drainage to contribute to the protection of the environment. The sections are aligning with the prevention of unauthorized companies or entities disposing of effluents without a permit and further avoid anyone to do so as many water bodies and the environment itself would be affected with the overload of sewage resulting from sewerage systems.

Similarly with **Statutory Instrument 132 of 2020**⁴² in which section 6(1) prohibits the discharge of trade effluent into the public sewer unless such trade effluent complies with

³⁷ Environmental Management Act chapter 20:27 (Act 13 of 200) Zimbabwe

³⁸ Section 4 of the Environmental Management Act chapter 20:27 Zimbabwe

³⁹ Section 4(2) environmental management Act chapter 20:27 Zimbabwe

⁴⁰ <https://www.citybyo.co.zw> Sewerage, Drainage and Water By-Laws , 1980 SI 888/79, 425/80, 506/80, 572/81, 200/84.

⁴¹ Section 9 of SI 390 Of 1980

⁴² Statutory Instrument 132 of 2020 <https://faolex.fao.org>

the standards set and in section 6(2)⁴³ states that no person shall cause, permit or allow trade effluent to enter a public storm-water drain or any stream. With the provisions cited it is promoting a collaborative way in which the applicants and the authority would work together in preventing sewerage challenges as the law is abiding on both sides.

This would be in line with the case of **Zimbabwe Environmental Law Association v. Chitungwiza Municipality and Environmental Management Agency**⁴⁴ in which the High court of Zimbabwe held that the Chitungwiza Municipality violated its obligation to ensure the treatment of raw sewage generated within its jurisdiction, prevent the discharge of this untreated sewage into the environment. The court also ordered that they provide portable water to its residents cease its unlawful acts and omissions, repair treatment plants and pay the costs of the suit.

The case illustrates the obligation of Authorities in abiding with the laws and doing their duties as by their virtue of them holding a certain position and to avoid absconding from their duties.

In **Zimbabwe Environment Law Association and Zakeu Nhachi and Rosemary Maruwa Jena and Elias Matsveruka and Mayimboti Mayimboti, Isaac Ziwenjere v. Anjin Investments (private) Limited, Marange Resources (private) Limited and Diamond Mining Company (private) Limited**⁴⁵ demonstrates the judiciary role in protecting the environmental rights especially where pollution directly affects the health, livelihood and dignity of communities as it gives legal weight to environmental justice and sustainable development aligning with **section 73 of the Zimbabwean Constitution**⁴⁶ which talks about having environmental rights and promoting the conservation of the environment.

The discharge of effluent and waste (including human waste) discharged regularly into the rivers had resulted in dangers to human health, destruction of aquatic life and infringement on community livelihood.

⁴³ Section 6(2) Statutory Instrument 132 of 2020

⁴⁴ 2778/2020 <https://www.escri-net.org>

⁴⁵ HH 523/15 HC 9451/12 HIGH COURT OF ZIMBABWE TAKUVA J HARARE, 5TH NOVEMBER 2013 ANA 17 JUNE 2015

⁴⁶ Section 73 of the Constitution (As Amended up to 30th September, 2018)

The cases illustrate on how strong their enforcement is with regards to laws imposed as they show how certain activities by both authorities and license holders including those who avoid obtaining a license would pose as a negative impact on the environment from sewage. Further they illustrate the importance of taking measures and care for the environment by making individuals liable.

Section 168 of the Urban Councils Act⁴⁷ requires municipalities to provide portable water to residents and crucially to ensure the treatment of raw sewage generated within their jurisdiction. The obligations under this Act are not merely guidelines but legally binding duties and the judiciary can actively intervene to enforce them. The judicial enforcement serves as an acting as a powerful mechanism for accountability, compelling local authorities to adhere to their statutory responsibilities regarding sewerage management.

2.5 ENFORCEMENT MECHANISMS IN BOTH COUNTRIES

Zambia and Zimbabwe both have legal and regulatory frameworks that exist to govern sewerage systems with enforcement mechanisms varying slightly but generally involving regulatory bodies, local authorities and legal actions. However Zimbabwe has a stronger enforcement with regards to their laws as they have more laws addressing laws specifically to sewerage systems and not generally to just applications of permits and discharge of effluents making it more efficient in addressing challenges with sewerage systems.

With an abundant existence of laws, it would lead to overlapping mandates. The existence of multiple actors with related functions creates a potential for overlapping institutional boundaries as it could lead to a duplication of efforts, jurisdictional disputes and unclear division of labour hindering effective service.

The question arises in where the law is lacking as in spite of the presence of these laws there continues to be challenges in the management of sewerage systems as evidenced by reports especially faced by Lusaka of overflowing sewers affecting the livelihood of

⁴⁷ Chapter 29:15

communities due to poor sanitation even the lack of sewer availability similarly with Zimbabwe.

Both countries seem to be facing environmental legal and regulatory challenges with regards to sewerage systems. Although it seems so, Zambia and Zimbabwe have different laws governing sewerage systems and doing this comparative analysis is to help address what Zambia is doing differently or is lacking. Zambia has the Environmental Management Act no. 12 that governs sewerage systems in terms of permit granting with regards to sewer effluents and the Environmental Protection and Pollution control Act.

Similarly Zimbabwe is governed by the Environmental Management Act (20:27) that promotes the protection of natural resources including the environment, it is further governed by the Urban councils Act that gives municipalities a responsibility to treat raw sewage and other statutory instruments mentioned with regards to the required standard of the discharge of sewerage systems.

These laws are enacted to avoid the imposition of environmental challenges faced with sewerage systems in Zambia and yet they continues to be challenges faced with sewers with continuous environmental pollution and water contamination from discharge of effluents in water bodies by either individuals and from trade waste

CHAPTER THREE

AN ASSESMENT OF THE ENVIRONMENTAL IMPACTS OF SEWERAGE SYSTEMS IN, ZAMBIA AND ZIMBABWE.

3.0 INTRODUCTION

The Zambian sewerage system continues to pose as a negative effect on the environment hindering effective sanitation and environmental protection. These challenges stem from both regulatory and existing laws.

S.47 of the Environmental Management Act states that an owner or operator of a trade or industrial undertaking who wishes to discharge into an existing sewerage system effluent from their plant shall obtain written permission to do so from the local authority operating or supervising the sewerage systems⁴⁸, Similarly as provided for under **S.26 of the Environmental Protection and Pollution Control Act**.⁴⁹ Henceforth, allowing for the discharge of effluents in existing sewerage systems, as a result posing regulatory and implantation challenges in that the permission can even be granted in a situation where license holders discharge in already full systems causing an overflow or burst of these old infrastructure. This chapter will henceforth focus on an assessment evident of environmental impacts of sewerage systems in Zambia as a result faced challenges.

In a report it was concluded that, urban sanitation is a common failure especially in developing countries like Zambia. The disposal problem of solid and wastewater are regarded as less important than the consideration of portable water supply. The fact is that without effective community-wide method to contain excremental, the full health impacts of a plentiful water supply will not be appreciated. The historical roots of such an assumption originated in times when it was acceptable to pour the wastewater into the nearest watercourse.

Urbanization is often the major problem in Lusaka and other cities in developing countries. The concept of ruralisation is not fully implemented so as to control urban drift. Capacity building and political will can contribute to improve sanitation situation in urban

⁴⁸ Section 47 of the Environment Management Act No.12 of 2011 chapter 87 of the Laws of Zambia

⁴⁹ Section 26 of the Environmental Protection and Pollution Chapter 204 of the Laws of Zambia

settlements were leaks from sewer pipes, waste stabilization ponds and illegal sewer connections are common.⁵⁰

The chapter will examine to what extent these legal and regulatory provisions effectively enforced and if there need to strengthen the already existing laws. Both Zambia and Zimbabwe have laws relating to sewer management but there continues to be an issue with sewers contributing to environmental pollution and degradation. There have been a lot of reports with regards to sewer management, an example is Lusaka.

Similarly in a Zimbabwean report where it was reported that the majority of sewerage reticulation systems are facing problems due to overloading in the density areas where additional treatment works have been built or extensions made to existing ones, often the reticulation system has not been upgraded as the increased flows coming from infilling or densification, subletting and increased occupancy rates common problems, and in cases such as Marondera they are serious. Other problems include leakage and blockages; also sand is used for the cleaning of utensils and accumulates in the reticulation system. Additionally problems are caused by solid objects which enter the system via squat pans or opened/ vandalized manhole covers. Such objects block or restrict the flow through pipes. These problems are exacerbated by the fact that levels of sewage now being conveyed in the sewer networks are far higher than that for which the sewer was designed.⁵¹

3.1 AN ASSESSMENT IN ZAMBIA

3.1WATER POLLUTION

On 18th February, an embankment that stores wastewater from copper mining operations broke releasing more than 50 million liters of waste into Mwambashi River, a tributary of the Kafue River, a major tributary to the Zambezi and the largest and longest river lying entirely within Zambia. The pollution is also believed to have caused unsafe irrigation and bioaccumulation of toxins in the food chain. Economically, this affects fisheries,

⁵⁰ The impact of urbanization, on sanitary conveyances and sewage treatment facilities in the city of Lusaka Zambia, Obed C. Kawanga <https://www.ssswm.info>

⁵¹<https://www.ircwash.org> Urban Sanitation in Zimbabwe and the relation to environmental pollution

agriculture, and tourism while imposing high cleanup costs. Long term effects could include persistent contamination and potential ecosystem collapse.⁵²

The breakout would be due to old age infrastructure as there has been continues permission of discharge in the infrastructure leading to the breakout. This is similarly happening in different areas especially in Lusaka. It is either due to a lack of or poorly built infrastructure or entirely aged infrastructure holding effluents and later posing a danger on the environment and human health.

It is a common practice among industries. Because industries use a lot of water, the majority of it is discharged as wastewater. As expected. Industries should treat the same water and reintroduce it into industry machinery for reuse. However, most industries in areas with lax environmental policies discharge raw sewage into waterways without any treatment. When this occurs, the people living downstream are the most affected by the effects of sewage pollution.⁵³

3.2 ENVIRONMENTAL DEGRADATION

The legal provisions for mining and sewage wastewater management in Zambia are criticized for many shortcomings, compromising environmental preservation and public health. These include ineffective enforcement mechanisms, restricted public participation, a fragmented legislative framework, conflicting mandates and inadequate monitoring. These concerns contribute to unchecked pollution and associated risks, necessitating immediate regulatory reforms and capacity-building measures to successfully manage them.⁵⁴

Both the mining sites and industries contribute to the well- being of the country and contributing to the economy however they also pose as a negative impact on the preservation of the environment, making it difficult to promote sustainable development as they contribute significantly to environmental contamination through the discharge of untreated or improperly managed wastewater. The discharge pollutes surface and

⁵² Birdlife international, Environmental disaster unfolds in Zambia, 7th March, 2025

⁵³ What are the causes of sewage <https://www.netsolwater.com>

⁵⁴ Richard Mutika, Review of minning and sanitation Waste Water management and their contribution to water communication in Zambia. (Iemos & Agrawal, 2008)

groundwater, harming aquatic ecosystems, contaminating drinking water supplies and posing health risks to humans and wildlife through the food chain.

It is of this reason that industries are to abide by the correct manner of sequence by obtaining a permit for the discharge and the authorities making sure that the grant is in line with what is asked for by law to promote a sustainable environment.

3.3 HEALTH HAZARDS

Untreated sewer discharges flows in water bodies or the environment; it leads to cases of health hazards such as outbreak of water disease like cholera, dysentery or typhoid. As people are lead to drink from water bodies that are most likely to be contaminated and have not been treated for safe drinking. People living in rural areas are mostly affected as they would not have an alternative to use that is why each individual is expected to take care of the environment by caring for others and in a manner that another person would find it enduring to live in.

Sanitary Sewer Overflow (SSO) contain raw sewage they carry bacteria, viruses, protozoa (plastic organism), helminthes (intestinal worms), and inhaled molds and fungi. As a result, they cause diseases ranging in severity from mild gastroenteritis (causing stomach cramps and diarrhea) to life-threatening ailments such as cholera, dysentery, infections hepatitis and severe gastroenteritis.⁵⁵

3.2.0 AN ASSESSMENT IN ZIMBABWE

3.2.1 POLLUTION OF WATER BODIES AND ECOSYSTEM DAMAGE

The environmental impact of sewer systems in Zimbabwe is severe and multi-faceted, causing widespread pollution of water bodies, degradation of aquatic ecosystems and public health risks. Zimbabwe is facing a major environmental crisis as unprecedented sewage pollution is damaging its natural balance, putting the health of people and wildlife at risk. Nearly every water source has been polluted and many rivers are badly

⁵⁵ <https://www.epa.gov>

contaminated. Years of raw sewage dumping have severely damaged these waterways, choking them hyacinth growth.⁵⁶

It was further reported that the capital city Harare is responsible for staggering amount of sewage. According to Environmental Education and Publicity Manager, Amkela Sidange stated that “Harare alone discharges around 219 mega liters of raw and partially treated sewage into the environment every day, which gives an idea of just how severe the crisis is”.⁵⁷ Although discharging waste into the environment without a permit is illegal, so far licensing seems to have done little to help this southeastern African country to achieve any improvement.

3.2.2 PUBLIC HEALTH HAZARDS

In Zimbabwe, it was reported that the recurring outbreaks of cholera and typhoid fever are a pressing health concern. In many of the city’s suburbs, public water supply is unreliable and leaking sewage pipes, pit latrines and poor waste management contaminate the groundwater.⁵⁸ It is for this reason that stronger laws and more reliable authority chain is needed to work against a weak enforcement mechanism carter for these issues been experienced by the country.

It was discovered that the burst sewage pipes are common in Zimbabwe, but officials say that the cost of replacing the pipes is too high, even though the presence of raw sewage in cities after pipes break has been blamed for cholera outbreaks in the past. Even when the local authority tried to fix the sewer bursts, they can no longer totally resolve the problem, because the system itself has collapsed.⁵⁹ Which still poses a question if due to the stated reason are people in the environment expected to live in an unfavourable environment. What are the authorities in charge of granting permits supposed to do when faced with such a situation, and will it still be an individuals’ fault for discharging on the environment due to a lack of proper laws addressing such issues, well built sewerage systems and accountability.

⁵⁶ Zimbabwe’s environmental ecosystem sinks in sewage pollution, Tadios Sokomondo Denya, 6th February 2025

⁵⁷ Tadios Sokomondo Denya, Zimbabwe’s environmental ecosystem sinks in sewage pollution, 6th February, 2025

⁵⁸ Water, waste and vaccination: Fighting cholera and typhoid in Zimbabwe, February 25, 2020 (May 2, 2023) <https://www.doctorswithoutboarders.ca>

⁵⁹ Fortune. T Moyo, (Despite grave Health Risks Zimbabwe City Lacks Funds to Fix Many Burst Sewerage pipes).

3.2.3 ECONOMIC CHALLENGES

Recently it was reported that sewage alliance has claimed that a staggering amount of economic losses are being generated each year as a result of poor sewage and waste water treatment across Brazil, India, Kenya the Philippines and the UK . it is no new revelation that untreated wastewater has serious consequences but it is not often thought of as an economic burden, nor as a burden on health systems but as an environmental problem.⁶⁰

When sewers are been left untreated for a long period of time, the more the situation worsens. That's why it is important to work on each and every case once reported to avoid the impact getting worse. Where sewerage systems are properly taken care of, there would be need of forming alliances with other countries and resources been used to form these alliances would actually address other pressing issues in the country to help with the development of that particular country.

3.3.0 CASES RELATED TO SEWER CONTAMINATION IN ZAMBIA AND ZIMBABWE

The Lusaka city council (LCC) had in 2024 warned and suspended operations at Royal Park platinum in Chilenje for operating under unsanitary conditions. This was when a team of officers from Public Health and Engineering departments conducted an operation, which revealed that the premises was operating with a blocked and collapsed sewer system, leading to discharge of faecal matter into the open environment.⁶¹

In a situation where blocked and collapsed sewer systems are properly taken care of, there would be no cases of business shutting down and cases of environmental pollution. Therefore it is important to take care of the situation before it leads to another that is taking care of sewer systems management before they pollute the environment to a manner that they become a negative impact to human health and the economy.

As was stated earlier that industries also do contribute to sewer pollution, authorities in Zimbabwe have been attempting to enforce laws penalizing companies that discharge

⁶⁰ <https://www.sustainabilityonline.net> 'staggering' economic losses generated from poor sewage and wastewater treatment 2025

⁶¹ Angel Kasabo, The Lusaka City Council (LCC) has warned and suspended operations at Royal Park, July 10, 2024 <https://rcv.co.zm>

waste into rivers which are used for water by citizens downstream. In written statement it was reported that dilapidated and overwhelmed national sewer infrastructure, prolonged legal proceedings, non-deterrent fines and absence of properly engineered waste dumping facilities for both general and hazardous waste, as they were one of the reasons of water pollution in Zimbabwe.⁶²

The laws are imposed on every person no matter the hierarchy and they are to be followed accordingly. In Zimbabwe for many years, this country's capital city has discharged sewage into its main water supply. Then, the city started charging to purify the water- a cost that locals say eats as much as a fifth of their income. The water they receive is not even clean. Now, the city council may privatize the water system. In January, Daniel Garwe, the local government minister, announced that the government has invited both local and international companies to submit proposals. The shift could lead to higher water bills.⁶³

If it is the duty of the authorities to make sure that laws are followed and yet they still contribute to the contamination, it would be difficult for a mere citizen to comply with such a law undermining the rule of law, compromising safety of the environment at large and weakens the relationship between the law enforcement and the community they serve. It also leads to inconsistent enforcement of laws, damaging community trust and the legitimacy of law enforcement institutions.

Similarly Zambian authorities have been found to have violated environmental laws in the past. A notable example is a court of Appeal ruling in 2020 involving the Zambian Air force projects and investors who caused water contamination and destruction of an environmentally sensitive forest and water area. According to the appellants' claims, in the case of **Moses Lukwanda and others v Zambia Air force Projects Limited and 7 others**⁶⁴ the construction that was going on in the forest 27 area, has been occasionally water contamination from effluent discharge at the Zambia Air Force (ZAF) Twin housing project. It was further stated in the case that the project was in contrary with the

⁶² Columbus Mavhunga, Some Zimbabweans worried by Raw Sewage discharged into rivers, march 21st, 2022

⁶³ Linda Mujuru, Zimbabwe's capital city contaminated its water. Now, residents must pay to use it, March 23, 2025 <https://globalpressjournal.com>

⁶⁴ Moes Lukwanda and 9 others v Zambia Airforce Projects Limited and 7 others CAZ/08/323/2019

provisions of both the Environmental Management Act (EMA) No.12 of 2011 and the Water Resources Management Act No. 21 of 2011.

This court of appeal found the application for an interim injunction meritorious and accordingly granted it. The court of Appeal decision, despite being an interim order, sends a strong message beyond the legal fraternity that global environmental protection must be actualized in Zambia as it is akin to protection of human life and other organisms that support human sustenance.

Recently in February in Lusaka there has been complaints from residents stating the continuous overflow of sewer effluent in Chilenje South of Lusaka has left many home owners desperate for a solution to the strong stench⁶⁵. Further it was later assessed by the authorities in Lusaka assessing properties in various parts of the city of Lusaka that were built on sewer lines, consequently causing blockages.⁶⁶ The encroachment on sewer systems makes it hard for sewer systems to work properly therefore there is need for corporation on Environmental management Authorities in charge of sewer permits and the Lands registry equally to citizens of the country who would end up building houses on sewers contributing to sewer blockages and later blaming it on the authority when the living standards become unbearable due to environmental pollution.

It is important note that building on sewer systems is against the law and therefore it is necessary to get a permit from the respect municipal council before embarking on any construction or projects. As the rainy season begins, sewer blockages become more common, often due to actions by the community who disrupt the proper functioning of the sewer system. Taking such an action would also prevent houses or buildings built on sewer lines from been demolished and ensure a safety environment to live in.

3.4.0 SPECIFIC PROJECTS RELATING TO SEWERS IN ZAMBIA

There are projects that have been made to carter for sewerage systems complaints in Zambia. Some of the projects have seized to exist due to one or another reason and other projects have succeeded in other areas in-spite of a number of cases being

⁶⁵ Purity Matafwali, SEWER EFFLUENT IRK RESIDENTS, 21 February, 2025

⁶⁶ Margret Luhanga, Lusaka Authorities Asses Properties Built on Sewer Lines 11February, 2025

reported and other projects are yet to be developed. Some of these projects include the ongoing Kalingalinga Salama Park Project Lusaka, the large scale Lusaka Sanitation program and the African Development bank however there continues to be a challenge with the management of sewers in Zambia.

3.4.1 FAILED PROJECTS

The Auditor general in a report dated 2020 had revealed that the Luapula Water and Sewerage Company (LpWSC) delayed the implementation of the integrated small towns water supply sanitation (ISTWSS) project despite funding worth US 33,453,611 being readily available. According to the Auditor General's report on the accounts of water and sanitation companies for the financial year ending December 31, 2019, interest US \$1003 608 had accrued on the money and works had not commenced over two years since signing of the financing agreement.⁶⁷

3.4.2 UPCOMING AND SUCESSFUL PROJECTS

The Lusaka Sanitation program- climate Resilient Sustainable infrastructure project of 2015 was aimed to entail rehabilitation and renewal works for the existing sewerage systems and necessary extensions as required. Onsite sanitation promotion in Peri-urban areas in the Matero and Chunga sewer shed, Kaunda Square sewer shed and chelstone sewer shed in the project area. The project increased access to sanitation, improved fecal sludge management, sewer network expansion, institutional strengthening, and community engagement and policy reforms.

The project provided over 2,200 new household sewer connections and 117 kilometers of sewer were rehabilitated and newly constructed under the project. However Zambia has struggled to provide adequate water and supply sanitation, crucial for its economic growth and social well-being. At the onset of the Lusaka sanitation Project in 2015, only 63 percent of the population had access to clean drinking water, and 43 percent had adequate sanitation⁶⁸.

⁶⁷ Natasha Sakala, 29th July 2020, Luapula water failed to implement sanitation project despite available \$33.4m <https://diggers.news>

⁶⁸ Transforming Sanitation for a more Sustainable and Healthier Future in Zambia <https://www.worldbank.org>

It is important to look at the failed projects together with the successful projects to help the upcoming projects so that in the near future no projects would be made as the problem would probably be taken care of due to a correct approach at hand and stronger enforcement mechanisms.

3.5.0 SPECIFIC PROJECTS RELATING TO SEWERS IN ZIMBABWE

Zimbabwe just like Zambia has projects relating to the improvement of sewer management. These projects include the Chitungwiza sewers compound of the urgent water supply and sanitation project, Crow borough project and the Norton STW improvement project.

3.5.1 FAILED PROJECTS

In 2012, Masvingo city council embarked on a multi-million extensive sewer overhaul Programme involving the construction of a seven-kilometer trunk gravity pipeline to convey sewer from high density suburbs and Victoria range. However, four years later, the project was put on hold when funding ran out. Several efforts to revitalize the project over the years have hit a brick wall due to limited funding.

The Mucheke trunk sewer upgrade remains incomplete and abandoned, twelve years after the project started and more than United States 4 million has been lost due to mismanagement henceforth stalling the project.⁶⁹ The project failed to succeed due to insufficient funds as the funds mandated to take care of the project were eventually lost. The project was not highly prioritised as such mismanagement would not have occurred.

3.5.2 UPCOMING AND SUCCESSFUL PROJECTS

There are been successful projects too, in spite of the underlying issue relating to sewerage systems. One of the successful projects is the Hopley B Dewarts project which was developed with the aim to test and implement a new, sustainable wastewater treatment system in an area difficult to the existing sewer infrastructure. The project is the first of its kind in Zimbabwe, and was set up as a pilot scheme by the local authority to test a new Decentralized Wastewater Treatment System (DEWATS) for sewerage. It was

⁶⁹ Melinda Kusemachibi, corruption leaves Masvingo trunk project in limbo, August 18, 2024
<https://www.pressreader.com>

tried and tested in neighbouring South Africa, it adopts a new green technology which uses a solar powered UV cleaning system to ensure that the discharged water is safe for the environment.⁷⁰

Having such a project with the inclusion of a solar powered UV cleaning system would help monitor sewerage systems without difficulty even in areas with worse loadshedding as the UV would be charged using solar. Such projects would also contribute to the well being of sewers in the environment as sewers are frequently monitored and other countries would actually adopt such projects too.

⁷⁰ <https://reall.net> Hopley B Dewats Project, Our Homes in Zimbabwe- Reall

CHAPTER FOUR

BEST PRACTICES AND POTENTIAL REFORMS THAT COULD ENHANCE ENVIRONMENTAL SUSTAINABILITY OF SEWERAGE SYSTEMS

4.0 INTRODUCTION

Sewerage systems are almost in each and every country in this world and each country has laws governing the well being of the environment and some even in relation to sewerage systems with regards to discharge of effluents. This chapter will be focused on how other countries are treating and managing their sewers while focusing on the objective of obtaining best practices and potential reforms that could enhance environmental sustainability of sewerage systems as it has occurred to be a problem faced with the environmental legal and regulatory frameworks of sewerage system in Zambia.

This will help our jurisdiction to adopt or borrow some of the ways that would either contribute or actually remove what already is been done and not in line with the well being of the environment, henceforth leading to potential reforms just as **Principle 7 of the Rio Declaration**⁷¹ poses that states shall operate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem.

4.1 SWEDAN

Swedan is one of the countries with good sewer management treatment. Swedan has taken waste treatment to a new level. Rather than just discarding waste, they treat it as a resource. Swedan imports waste from other countries to fuel their waste to energy plants.⁷² For example the Henriksdal wastewater treatment plant is Sweden's largest sewage treatment plant, serving nearly a million residents. It is renowned for its energy and cutting-edge biogas production. The country's water treatment facilities and waste-to-energy plants are models of environmental responsibility.

⁷¹ <https://www.cbd.int> The Rio Declaration on environment and Development (1992)

⁷² <https://www.envynature.org>

4.2 SINGAPORE

The **Sewerage and Drainage Act 1999**⁷³ in section, 4 provides for the construction and maintenance of public sewerage systems. The Act states that the Board may cause to be made and constructed any public sewerage system, must maintain and keep in repair every public sewerage system and may enlarge, alter or otherwise improve or discontinue, close up or destroy any public sewerage systems which the Board thinks is useless or unnecessary.

As earlier discovered the negative impact of sewerage systems is not only caused from not abiding by the correct procedure of discharge but also by old infrastructure or lack of infrastructure and people are forced to use other means hence polluting the environment. The country of Singapore has specific laws dealing with the construction and maintenance of sewerage systems and putting the Board in charge. Having such laws would help improve the negative impact on the environment as issues are addressed and roles are specifically addressed to each individual making it easier for accountability purposes.

Other than the laws, In Singapore, waste of its wastewater is taken by turning sewage into safe, clean drinking water using an advance filtration and treatment system. The Changi water Reclamation plant forms the core of the system, with capacity to treat up 900 million liters of wastewater daily roughly equivalent to the water held by 350 Olympic swimming pools.⁷⁴

This is done when wastewater from sewers arrive at the plant through 48 kilometers of connected tunnels, where it is filtered and pumped to the surface. Bacteria, viruses and other impurities are then removed first using a high tech filtration system, and then using ultraviolet rays to disinfect the water. Once treated, the water is used extensively by industries like the island's large microchip manufacturing sector, which is heavily water dependent. It is also used to top up reservoirs of drinking water, which can evaporate in the intense heat of the dry season.

⁷³ Section 4 of sewerage Systems Act 1999 of Singapore

⁷⁴ Johnny Wood, Singapore is leading the way in recycling wastewater. What can it teach the rest of the world? November 30, 2022 <https://www.weforum.org>

Using this method would help prevent sewer pollution and contribute to sewer management. However this does give way to polluting the environment with hope of it been taken care of as the Environmental Management Act No.12 of 2011 emphasis on the importance of a clean environment and prevention of pollution by holding people who are in contravention with the law liable.

4.3 JAPAN

Another notable country with great sewerage maintenance and treatment is the country of Japan. The country has a **Sewerage Act No 79 of 1958**.⁷⁵ Chapter 2 in section 1 deals with sewerage systems management specifically Article 3(1) which states that municipalities are to conduct installation, reconstruction, point repair, maintenance and any other administrative operations of public sewerage systems. Further in Article 3(2) allows for were two or more municipalities benefit from public sewerage systems but installation proves difficult, consultation may be carried out and approved by the municipal assemblies.

The law governing public sewerage systems in Japan shows determination in environmental protection especially in Article 3(2) were it gives room for consultation for the benefit of the municipalities. Environmental preservation and sustainable development can only be attained by each person working to the contribution of its well being just as **Principle 10 of the Rio Declaration**⁷⁶ which is of the view that environmental issues are best handled with the participation of all concerned citizens at a relevant level, allowing each individual to have access to information concerning the environment that is held by public authorities. Where each and every citizen is working towards to the prevention of sewer pollution discharge and the responsible Authorities doing their work in permit permission and accountability purposes, the environment would be a better place to live in.

⁷⁵ <https://www.japaneselawtranslation.org> chapter II-1 public sewerage systems, Sewerage Act No.79 of 1958

⁷⁶ The Rio Declaration on Environment and Development (1992) Principle 10

4.4 SOUTH AFRICA

South Africa just like Zambia and any other country face challenges of sewerage systems. However the **Wastewater and industrial Effluent Act**⁷⁷ provides for clearing of blocked private sewers. It states that the city must deliver a written notice containing a stipulated timeframe in which the owner must clear blockages, maintain or replace private sewer or sewer installation. It further states that where owners fail to do so within the timeframe the city may arrange for the clearing of blocked private sewer and owners are to pay a specific amount.

These laws pose as a duty on both the Authority and owners of these private sewerage systems to do their jobs as per the Act. In so doing there would be no cases of sewers been blocked or overflowing as each individual are aware of the part of role they are to play. It is also a great responsibility of the authority where the owner fails to maintain or clear the private sewerage systems to do so as it is only right for them to lead by example.

Further in **Chapter 1 of the Wastewater and Industrial Effluent by-law**⁷⁸ states that every owner of property shall on receipt of written notice by the council, construct a private sewer installation on the premises, connect a private sewer installation to the municipal sewer whether directly or indirectly as required by the council and enlarge the capacity of a private sewer installation to accommodate a greater discharge or reconstruct a private sewer installation.

Most places in Zambia like Lusaka in rural areas have little or nothing when it comes to discharge of effluents. The laws guide on requiring a permit to allow an individual to discharge such waste as required by the law however having laws as the ones stated in chapter 1 of the waste water and industrial effluent may prevent individuals in rural areas in discharging effluents on the environment as this pollutes the environment and affects the health of people living in such an environment. It is important for each citizen to follow such laws as to help fight against the negative impact of sewerage systems on the environment.

⁷⁷ Legislation as at 7 February 2014 <https://media.lawlibrary.org.za>

⁷⁸ Wastewater and industrial Effluent by-law

4.5 DENMARK

Denmark provides a leading example of applying the Polluter Pays Principle through continuous financial pressure via a wastewater discharge tax. The Polluter Pays Principle (PPP) is an environmental law principle requiring entities that cause pollution to bear the costs of preventing, controlling and rectifying the damage. It is provided for under **Principle 16 of the Rio Declaration**⁷⁹

Denmark has a framework of laws and regulations including Danish Environmental Protection Act and the law governing tax on sewer (wastewater) discharge in Denmark which regulates the wastewater tax that applies to domestic and industrial wastewater discharged in Denmark.⁸⁰ The legal instrument is fundamentally different from traditional discharge permits, which only impose penalties when a specific limit is exceeded. The Danish tax acts as a continuous, dynamic financial incentive, rewarding reduction in pollution below legally permissible limits.

This economic feedback loop has successfully driven highly innovative and progressive optimization strategies within the Danish water sector, leading to advances in treated wastewater quality and mitigating negative impacts on aquatic ecosystems. Welfare-economic assessments suggest that the environmental value generated by tax comfortably exceeds its administrative and implementation costs, demonstrating a net social benefit. The continuous economic pressure mandates that utilities seek constant technological improvement, providing a powerful blueprint for developing nations seeking to improve wastewater management efficiency and promote environmental consciousness.⁸¹

4.6 GERMANY

German law establishes a rigorous and prescriptive standard for sewerage management. The Federal Water Act (WHG) explicitly prohibits the discharge of untreated waste water into rivers and lakes, irrespective of the source-private households, trade or large-scale

⁷⁹ The Rio Declaration on Environment and Development 1992 <https://www.iisd.org>

⁸⁰ <https://businessdenmark.virk.dk>

⁸¹ the status of wastewater treatment and environmental protection in Vietnam and lessons from Denmark <https://www.nso.gov.vn>

industry.⁸² The core legal enforcement mechanism rests on the concept of the Best Available Technology (BAT).

The Federal Water Act (WHG) stipulates that pollutants contained in drainage water must be reduced in line with BAT. This technological prescription ensures a dynamic regulatory floor that requires continuous modernization. Compliance is not a static state; by mandating best available practices, the law shifts the burden of proof to the discharger to demonstrate adherence to the current state-of-the-art technology, making it easier for regulators to compel reinvestment and address technological obsolescence.⁸³

Germany has come up with the Sewerage Sludge Ordinance of 15 April 1992 which has been in effect to date and supplements provisions of fertilizer ordinance. The ordinance regulates pollutants in the use of sewage sludge for fertilizing agricultural soils. It also stipulates that sewage sludge application is to be limited and completely prohibited on land used to cultivate fruit and vegetables, permanent grassland and in certain water protection areas.

The new ordinance tightens the existing requirements for soil-related sewage sludge utilization and extends its scope of application to include landscaping measures. The operators of wastewater treatment plants and sewage sludge incineration plants are required to comply with these requirements starting 2029 at the latest.⁸⁴ The Ordinances are to address the amount of sewer sludge that is usually discharged on the environment due to either an overflow of sewers or caused by the negligence of people by controlling how much is discharged upon the environment and at the same time prohibiting such acts as they pose a danger to the soil used for growing plans.

4.7 AUSTRALIA

To manage and maximize the efficiency and effectiveness of sewerage utility management and the management and sanitary drainage on premises, powers and responsibilities under the sewerage and water supply 1949 and its subordinate legislation

⁸² Wastewater <https://www.bundesmwetministerium.de>

⁸³ Wastewater BMUKN <https://www.bundesumweltministerium.de>

⁸⁴ <https://www.bundesumweltministerium.de>

are delegated to local governments. The delegated powers and responsibilities are defined in administrative procedures or in their legislation⁸⁵.

The **Sewerage and Water Supply Act**⁸⁶ in part 4 of section 23, the Act prohibits certain substances and trade waste. Specifically in section 23(2) states that a person must not discharge trade waste into storm water drainage. Further in section 23(3) that a person must not discharge trade waste into storm water drainage as they will be liable to maximum penalty- 1000 penalty units.⁸⁷ The trade waste prohibited as defined in the same Act is water-borne waste from business, trade or manufacturing premises, other than waste that is prohibited substance, human waste and storm water drainage.⁸⁸ While storm water drainage is defined as a drain, channel, pipe, chamber, structure, outfall or other work used to receive, store, transport or treat storm water.

The Sewerage and Water Supply Act prohibits discharge of trade waste in storm water drainage as the waste may contain harmful substances that may end up flowing in to rivers or any water bodies that may pose as a danger on human health and the environment at large. Having such a law helps regulate a standard waste discharge that is required by law and holding each individual liable for not abiding by the laws.

4.2.0 LEGAL AND REGULATORY FRAMEWORKS GOVERNING SEWERAGE SYSTEMS INTERNATIONALLY

4.2.1 BRAZIL

Historically, Brazil's water and sanitation infrastructure has consistently received the least investment compared to other sectors. As a result, progress has lagged behind. The country is still far from achieving full access for all households. In 2020, a major reform took place in the sector with **Law No. 14,026/2020**, better known as the **New Legal Framework for Water, Sanitation, Drainage and Urban Waste services**. Among the approved changes, two stand out; the first was the opening of the market to private initiatives through Public-Private Partnerships (PPP). The other equally important change

⁸⁵ <https://www.legislation.qld.gov.au> Standard Sewerage Law

⁸⁶ Sewerage and Water supply Act 1949 part 4 section 23

⁸⁷ Sewerage and Water Supply Act 1949

⁸⁸ Sewerage and Water Supply Act 1949 Part 4 section 23(1)

was that of assigning to the National Water and Sanitation Agency (ANA) whose role with the regulation standardization covers all aspects of the sector including, portable water supply, sewage collection and treatment, urban cleaning and solid management.⁸⁹

The water Supply and Sanitation sector (WSS) in Brazil also includes drainage and urban waste services, and falls under the responsibility of municipalities. Municipalities are responsible for service provision and regulation, which can occur at the municipal or state level. Having a regulatory framework responsible with the treatment and collection of sewage is a good initiative that can be adopted by each country as Laws sometimes seem to be a challenge to be followed by many.

4.2.2 LEGAL, REGULATORY AND INSTITUTIONAL FRAMEWORK OF WATER AND SANITATION SERVICES IN THE EASTERN AND SOUTHERN AFRICA REGION

Deteriorating quality of service provision and disease outbreaks (such as cholera) led to the institution of Water Supply and Sanitation (WSS) sector reforms in Eastern and Southern Africa region in the 1990s. The realization of the urgent need to improve need to improve the performance of the sector, especially as related to health impacts, resulted in the formulation of new policy and legal institutional frameworks to reorganize the sector and establish regulators who could address networked Water Supply and Sanitation systems.⁹⁰

Regulators as policy implementers have the delicate role of balancing the interests of government, service providers and consumers. Decision- makers continue to design, implement and evaluate the outcomes associated with new frameworks. Regional regulatory cooperation can accelerate improvements in service provision to meet the United Nations Sustainable Development Goals through development of common frameworks and approaches for Water Supply and Sanitation system that can be adapted to unique country situations.

⁸⁹ The New Legal Framework for Water and Sanitation services in Brazil <https://www.iwa-network.org>

⁹⁰ Legal, Regulatory and institutional Framework of Water and Sanitation services in the Eastern and Southern Africa Region <https://oxforde.com>

4.2.3 URBAN WASTEWATER TREATMENT DIRECTIVE: EUROPEAN UNION

In late 2024, the European Union adopted a sweeping revision to its Urban Wastewater Treatment Directive (UWWTD) – the first major update since 1991. The new rules reflect three decades of progress and the urgent need to address emerging challenges such as micro pollutants, climate impacts and sanitation inequality. With stricter treatment standards, expanded coverage to smaller towns and ambitious targets for energy neutrality, the directive charts a bold path towards cleaner rivers, resilient infrastructure, and a circular economy of wastewater⁹¹. It introduces several new provisions for wastewater management such as:

Extends coverage to smaller towns: Lowers the threshold to include, all agglomerations above 1,000 population-equivalents requiring proper sewer systems and treatment for small communities. Under the 1991 directive, only towns with more than 2,000 population equivalent were covered. This is a good initiative to be looked at as sewer pollution does not only amount from a larger population but also in small areas especially in urban and shanty compounds with no proper sewer sanitation.

Sets stricter Treatment Standards: mandates more intensive nutrient removal- specifically nitrogen and phosphorus- and introduces new obligation for micro pollutant treatment at large wastewater treatment plants. This means adding tertiary and quaternary treatment steps to catch pollutants like pharmaceuticals, cosmetics and micro plastic. Tertiary treatment being the removal of nutrients (nitrogen and phosphorus) designed sensitive areas to combat eutrophication while quaternary treatment is required for the removal of micro pollutants (contaminants of emerging concern) such as pharmaceuticals and cosmetics.

Introduces the Polluter Pays Principle: Establishes Extended Producer Responsibility (EPR) which requiring the, pharmaceutical and cosmetics companies to finance at least 80% of the costs of advanced micro pollutant removal. This measure eases the financial burden on utilities and citizens.

⁹¹ Urban Wastewater Treatment Directive: A guide for EU Utilities <https://www.cambi.com>

Targets Energy and Climate Neutrality: requires wastewater treatment plants to dramatically improve energy efficiency and increases on-site renewable energy generation, with the goal of achieving energy- neutral operations by 2045.

Improves Stormwater Management and Reporting: obliges large cities to develop integrated storm water management plans to curb sewer overflows and streamlines data reporting through digital platforms. It also promotes the reuse of treated water and the recovery of resources, like phosphorus from sludge.

The selected countries among many others point out a proper way regarding the challenges of environmental legal and regulatory frameworks of sewerage systems. For example the Singapore sewerage and drainage Act of 1999 provides for the maintenance and construction of sewerage systems, similarly with Japan, in their Sewerage Act No.79. These laws just as Zambian laws govern sewerage systems towards the well being of the environment by limiting certain substances such as trade waste in relation to the Australia's Sewerage and Water Supply Act

These countries can not only be used as an example as their laws show how laws governing sewerage systems are imposed and are specifically addressed and not generalized as leaving room to question enforceability purposes and accountability as their laws address the responsibilities of both the authority and the permit holder including mere individuals towards the maintenance and treatment of sewerage systems and further by coming up with other strategic ways in sewer treatment away from the laws as to carter with the environmental challenges faced with sewerage systems.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.0 INTRODUCTION

This chapter is going to discuss a summary of the entire thesis by bringing out the challenges and possible recommendations that can be taken by looking at other reforms and approaches taken by other countries and looking at what the country can do differently addressing the challenges faced with the legal and regulatory framework of sewerage systems in Zambia as there continues to be challenges faced with sewerage systems hence as a result they are posing as a threat to the environment and human life in spite of the existing laws and weak enforceability and a lack of specific laws.

5.1 GENERAL CONCLUSION

The right to a clean, safe and healthy environment is very important as it was illustrated in the **Environmental Management Act of 2011**⁹² as subject to the Constitution, every person living in Zambia has such a right and further in **section 4(3)**⁹³ gives an option of bringing an offence in a situation where a person feels that such a right is infringed or taken away. As discussed in the previous chapters, sewerage systems are facing challenges with regards to its legal and regulatory frameworks as due to insufficient or weak enforcement mechanisms and poor management of the already existing sewerage systems and issues of accountability are not clear hence the environment and people of the same environment are made to suffer due to pollution caused by sewers.

SUMMARY OF CHAPTERS

This dissertation consists of five (5) chapters relating to the topic of legal and regulatory frameworks of sewerage systems in Zambia with a comparative study with Zimbabwe.

CHAPTER ONE

⁹² Section 4, Environmental management Act 2011

⁹³ Environmental Management Act 2011

Chapter one focused on analyzing what sewerage systems are and laws governing sewers. It further addressed the background of this thesis, statement of the problem, research objectivities which are to conduct a comprehensive comparative analysis of the legal and regulatory frameworks governing sewerage systems in Zambia and Zimbabwe. Secondly, to assess the environmental impacts of current sewerage practices in both Zimbabwe and Zambia and lastly to identify best practices and potential reforms that could enhance environmental sustainability of sewers by looking at other countries. This chapter brings out the research questions, significance of study, and the scope of study, literature review, and research design and data analysis.

CHAPTER TWO

This chapter focused on a comparative analysis of the legal and regulatory frameworks governing sewerage systems in Zambia and Zimbabwe. As both countries experience challenges with sewerage systems. The chapter looked at the Laws governing sewers and environmental protection and their enforcement mechanisms’.

CHAPTER THREE

Chapter three of this thesis focuses on the environmental impacts of sewerage systems in both countries relating to the legal, regulatory frameworks and sewer imposition. The chapter also emphasized on cases reported to have been as a result of challenges in sewers and how they are a negative impact on the environment due to either lack of accountability by authorities, weak enforcement laws and a lack of specific laws.

CHAPTER FOUR

This chapter focused on addressing best or nearly best and potential reforms that could enhance environmental sustainability of sewerage systems. This chapter brought out notable countries with their strategic ways of handling challenges faced with their sewerage systems and how they manage sewer treatment. It further brought out alternative ways to avoid sewer challenges.

CHAPTER FIVE

This chapter is focused on the conclusion of this thesis and recommendations that would be adopted to help with the legal and regulatory challenges faced with sewerage systems in Zambia.

5.2 RECOMMENDATIONS

1. IMPLEMENTATION OF STRONGER LAWS

Having stricter laws imposed with sewerage management and specifically stating the roles and duties for each person would contribute to the well being of the management and control of sewerage systems. Zambia can also look at how other countries are managing and maintaining their sewerage systems and adopt some of the reforms and how their laws are different from ours. An example is using the recycling method used in Singapore mentioned in the previous chapter where discharged effluent is treated using a special method and later the discharged effluent is used for agriculture and many more things.

2. CREATION OF AWARENESS PROGRAMS

The Government can come up with programs addressing the importance of having good sewerage systems further and how to manage or control them. These programs can be addressed to every person living in Zambia and the programs to be readily available so as to include even the less privileged. This way the fight against sewers will easily be dealt with as each individual will be working towards a common goal, and that's improving the Environment.

3. MULTILATERALISM

Involving with multiple countries to help fight towards the legal and regulatory challenges faced with sewerage systems would help not only with the enforcement but countries would also come in to help fund the maintenance of these sewerage systems as most sewers are either overflowing or bursting due to old infrastructure which has become

weak to contain the discharged effluent and authorities keep giving permits without a proper investigation before doing so or supervision in the required amount to be discharged.

4. MOBILIZE CLEANUP DRIVES

Regular cleanup drives are pivotal in maintaining the cleanliness of public spaces. Government can come up with specific laws addressing the regular cleanup of sewers by the authorities or individuals who would seek permits to discharge effluents to avoid the blockages of these sewerage systems. These efforts not only enhance the visual appeal of the neighbourhood but also inculcate a sense of ownership and accountability as each individual play their roles.

5. ADOPTION OF WASTEWATER TREATMENT DIRECTIVE

Adopting a new directive to wastewater treatment can contribute to solving the challenges faced with the environmental, legal and regulatory challenges faced with sewerage systems. An example is one adopted by the European Union, with the new rules reflecting three decades of progress and urgent need to address emerging challenges such as pollutants and sanitation inequality. It further has stricter treatment standards, expanded coverage to smaller towns and ambitious neutrality. It also introduces the polluter pays principle and improves storm water management and reporting.

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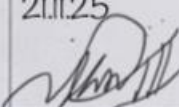
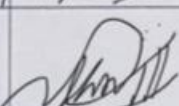
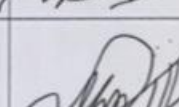
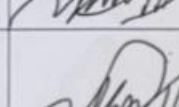
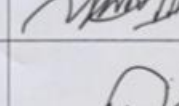
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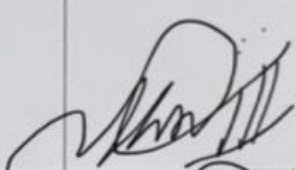
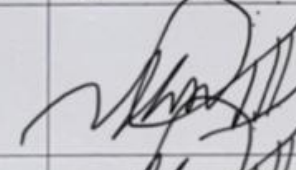
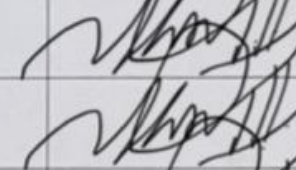
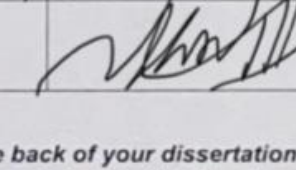
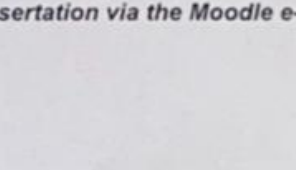
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L400B / Dissertation II – DIRECTED RESEARCH (OBLIGATORY ESSAY)

RESEARCH CLEARANCE FORM

NAME: MARTHA MONTI STUDENT NUMBER: CU22112557
SUPERVISOR: MR K.G.M. CHISANGA TOPIC: INVESTIGATING THE
ENVIRONMENTAL, LEGAL AND REGULATORY CHALLENGES OF
SEWAGE SYSTEMS IN ZAMBIA: A COMPARATIVE STUDY WITH ZIMBABWE

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Chapter 1 – Introduction	None		31st July 2025 
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Second Draft	Nil		3rd November 2025 ajhu
Final Draft	Nil		9 November 2025 ajhu

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