SANITATION AND DRAINAGE IMPROVEMENT STRATEGY AND INSTITUTIONAL FRAMEWORK FOR LILONGWE CITY

DRAFT

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FOREWORD

The Government of Malawi (GoM) has made remarkable progress towards access to safe drinking water and improved sanitation. Whereas the GoM is committed to achieve global commitments through its development policies and plans, Malawi's capital city Lilongwe of one million residents faces major challenges. The city's sewerage system serves only 5% of its population, while the rest rely on onsite sanitation systems of variable types and quality. Lilongwe's low-income areas are dominated by traditional, unimproved pit latrines. Safe collection and disposal of faecal sludge from these areas is near non-existent, and open defecation is a concern. Poor solid waste collection efficiency exacerbates a precarious sanitation situation, and impedes proper drainage and flood management. As Lilongwe's population grows, so will access to pipe water networks. The environment development challenges can only grow. It is necessary to accelerate improvements in sanitation and drainage, and put Lilongwe city back on track towards achieving the 2030 target: universal access to safely managed sanitation services.

In order to meet the GoM development objectives and guide city-wide sanitation planning, the *Sanitation and Drainage Improvement Strategy and Institutional Framework for Lilongwe City* has been developed. Its purpose is to close the gaps in delivery of sanitation and drainage services across Lilongwe city. The proposed measures are within the broad framework of the Lilongwe Water and Sanitation Project (LWSP). The Strategy focuses on improvements at household level, institutions and public places. Improvements in faecal sludge and solid waste management, and urban drainage will not only benefit Lilongwe's public health and environment, but will enhance the living conditions in its low-income areas.

The LWSP builds on recent efforts to improve water and sanitation provision in Lilongwe city: i) Extending Water Supply, Sanitation and Hygiene and Solid Waste Management services in peri urban areas (2014-2016), and the peri urban Water and Sanitation Project (2009-2012), both supported by the EU; ii) the World Bank-funded Sanitation and Hygiene Promotion Campaign in low-income areas (2013-2015); iii) School WASH Project (2017-2018) supported by Habitat for Humanity Germany; and iv) the WaterAid-funded WASH for Healthy Learning Project (2019-2022), among others.

In line with the GoM's vision to create an inclusively wealthy and self-reliant middle-income country, the Strategy seeks to turn Lilongwe into "the most clean and green City." The Strategy spells out the context within which it was developed, Lilongwe city's vision and mission statement, the city's goals and objectives, the guiding principles, strategic pillars and/or components, the strategic actions, how the proposed measures will be financed, the implementation arrangements, how the Strategy will be implemented, coordinated and monitored, and the associated responsibilities and resources.

The strategy was formulated via a multi-level stakeholder consultation. In addition to Lilongwe City Council, the Strategy was reviewed by expertise from Lilongwe Water Board, the Ministry of Forestry and Natural Resources, the Ministry of Local Government and Rural Development, the Ministry of Transport and Public Works, the Ministry of Health and Population, UNICEF, WATERAID, CICCOD, among others.

Finally, I appreciate the valuable inputs and contribution all participants rendered towards development and finalisation of the Strategy. Special thanks to the LWSP Project Coordinator and the Project Implementation Unit.

"A future Lilongwe that is Clean, Green and Prosperous".

The Mayor

Lilongwe City Council

ACKNOWLEDGEMENTS

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Lilongwe City Council further expresses gratitude to all entities and the people that provided contributions towards the production of this Strategy and Institutional Framework. The contributors to this Strategy and Institutional Framework included the national-level government stakeholders, city-level stakeholders, non-governmental organisations, civil society organisations, private sector operators, and city residents in selected areas of Lilongwe City where surveys were carried out. Their availability and support, either by sharing their experiences, knowledge or data, made it possible to prepare this Sanitation and Drainage Improvement Strategy and Institutional Framework for Lilongwe City.

Lilongwe City Council further thanks the staff of the Lilongwe Water Board (LWB) Project Implementation Unit (PIU) and the staff of Project Support Unit (PSU) which was setup under LCC for their active participation, fieldwork support, review of draft documents which provided useful and constructive recommendations and their general coordination of the activities leading to the production of this Strategy and Institutional Framework.

EXECUTIVE SUMMARY

BACKGROUND TO THE STRATEGY

Malawi is a signatory to the Sustainable Development Goals (SDGs) that seek to ensure safe drinking water and sanitation for all by 2030. Nonetheless, its Capital City of Lilongwe of one million residents faces major challenges.[1] The assessment of the existing situation revealed that Lilongwe's sewerage system serves only 5% of its population, while the rest rely on onsite sanitation systems (69% pit latrines and 25% septic tanks). Low-income areas are dominated by traditional, unimproved pit latrines. Collection and safe disposal of faecal sludge from these low-income areas is almost non-existent, while open defecation is yet to be eliminated. Inadequate hygiene is a concern across the board as only 1 in 5 of the city's households have access to handwashing facilities with soap and water. The City's public schools are characterised by a high pupil to toilet stance ratio and poor menstrual hygiene management.

Besides low customer connectivity (5%), Lilongwe's sewerage operations are constrained by inadequate treatment capacity, poor network maintenance and management. The current faecal sludge treatment capacity is just over 10% of the city's needs. With Lilongwe's population projected to double to about 2 million by 2035, there is need to increase the treatment capacities of both faecal sludge and wastewater to cater for the growing demand.

Whereas the bulk of LCC's resources are committed to solid waste management, the collection efficiency is in the 10-30% region, which is significantly low. Gaps in wastewater and faecal sludge management, and disposal of solid waste are intrinsically linked to urban drainage. The situation will get worse as the Lilongwe City's population grows, and as access to pipe water networks improves. As sanitation has been identified as a key environmental development issue for Lilongwe City, it was deemed necessary to develop a strategy to drive improvements in sanitation and drainage.

PURPOSE AND STRATEGY DEVELOPMENT PROCESS

The Strategy will guide city-wide sanitation planning and development towards achieving universal access to safely managed sanitation services in Lilongwe city by 2030. The strategy is anchored on a step-wise, incremental approach to close gaps along the sanitation chain. The Strategy recognises that waste management is fundamentally linked to urban drainage, and identifies measures to address the existing gaps. The proposed strategic actions follow a three-pronged approach: i) strengthen the enabling environment for sanitation and drainage; ii) enhance demand for improved sanitation and drainage; and iii) strengthen the supply of improved infrastructure, products and services.

The Strategy places emphasis on improvements at household level, institutions and public places. The low collection efficiency of faecal sludge and solid waste is given due attention. So are improvements in wastewater and faecal sludge treatment, and stormwater management.

[1] World Bank, 2017. Lilongwe Water and Sanitation Project – Project Appraisal Document.

The strategy was developed through a participatory and consultative approach. Preliminary work entailed a desk review of the relevant policies, legislation and institutional frameworks that guide delivery of municipal services. The existing sanitation and drainage situation was assessed, and gaps were identified. Best practices and lessons for Malawi were drawn within the region, presented and debated by key stakeholders via a series of workshops. The discussions formed a basis to develop this strategy to ameliorate the existing situation.

VISION, MISSION AND GOALS

In line with Malawi's Vision 2063 to create an inclusively wealthy and self-reliant middle-income country and the Government's global commitments, the Sanitation and Drainage Improvement Strategy seeks to turn Lilongwe into the most clean and green City. This Vision will be achieved via provision of inclusive access to resilient and sustainable sanitation and drainage services.

In order to realise the above, the strategy is premised on the following goals: i) increase access to safely managed sanitation services in Lilongwe city; ii) effective and efficient solid waste management services; and iii) improve drainage systems, protect buffer zones/catchment in order to control flooding in Lilongwe City.

CHANGES TO THE EXISTING SITUATION

Upon successful implementation, the existing situation in Lilongwe city will improve as follows:

- Harmonised policies and legislation to guide delivery of sanitation and drainage services;
- Strengthened regulation enforcement and compliance to sanitation standards;
- Increase in access to improved sanitation services from 71% to 100% by 2030;
- Elimination of open defecation by 2030;
- Improvement in waste collection efficiency from 10% to 95% by 2031;
- Universal access to safe pit-emptying services in low-income areas;
- Improved pupil to stance ratio in public primary schools from 1:200 to 1: 60 by 2030;
- Improved sanitation and hygiene in health centres, markets and other public spaces;
- Rehabilitated, expanded and functional sewer network;
- Ten-fold improvement in faecal sludge treatment capacity from 72 m^3/day to 1,095 m^3/day;
- Improvement in wastewater treatment capacity from 9,000 m^3/day to 40,600 m^3/day;
- Improved city drainage and flood management;
- Enhanced sector coordination, performance monitoring and planning.

COST AND IMPLEMENTATION PLAN

A total commitment of USD 306 million (including tax charges and contingencies) will be required to realise the objectives of the strategy over a period of 15 years (2022-2036); the first year of implementation will be FY2022/2023 and last year FY2036/2037. O&M requirements are considered as input for cost recovery analysis.

The costs are divided into two main categories: i) infrastructure, and ii) non-technical (software) measures. This includes sector coordination, technical assistance, market development, capacity building, communication, regulation enforcement, information management, among others. A detailed breakdown of the costs is provided in the Implementation Plan. The strategic actions investments are categorised in four sub-themes as indicated below:

- The estimated cost of measures to strengthen the enabling environment is USD 22 million;
- Improvements in on-site and off-site sanitation will cost USD 179 million;
- The cost of measures to improve drainage is USD 71 million; and
- The cost estimate for improvement in solid waste management is USD 34 million.

ACRONYMS AND ABBREVIATION

CBO	Community Based Organization
CICOD	Circle for Integrated Community Development
DCT	District Coordinating Team
F/Y	Fiscal Year
GoM	Government of Malawi
IDA	International Development Association part of the World Bank
IEC	Information, Education and Communication
JFA	Joint Financing Agreement
JSR	Joint Sector Review
LCC	Lilongwe City Council
LWB	Lilongwe Water Board
LWSP	Lilongwe Water and Sanitation Project
M&E	Monitoring and Evaluation
MDAs	Ministry Departments and Agencies
MIS	Management Information Systems
MoAIWD	Ministry of Agriculture Irrigation and Water Development
MoEST	Ministry of Education, Science and Technology
MoFNR	Ministry of Forestry and Natural Resources
MoGCDSW	Ministry of Gender, Children, Disability and Social Welfare
MoH	Ministry of Health
MoLG	Ministry of Local Government
NGO	Non-Government Organization
NRA	National Roads Authority
NSHS	National Sanitation and Hygiene Strategy
NWDP	National Water Development Programme
NYSHIPS	National 10 Years Sanitation and Hygiene Investment Plan and Strategy
O&M	Operations and Maintenance
PIU	Project Implementation Unit
PMU	Project Management Unit
RFA	Roads Fund Administration
SDGs	Sustainable Development Goals
SIP	Sector Investment Plan
SWaP	Sector Wide Approach
SWG	Sector Working Group
SWM	Solid Waste Management
TWG	Technical Working Group
WASH	Water, Sanitation and Hygiene
WaSWaP	Water Sector Wide Approach
WES	Water and Environmental Sanitation Network
WSDPG	Water and Sanitation Development Partners Group

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1 INTRODUCTION AND ANALYSIS

1.1 BACKGROUND TO THE STRATEGY

Malawi is a signatory to the Sustainable Development Goals (SDGs) that seek to achieve universal coverage of water supply, sanitation and hygiene (WASH) services by 2030. The Government of Malawi (GoM) has taken significant steps to achieve the global targets through its development of policies and plans. Nonetheless, the water and sanitation sector is off-track on the 2030 targets. In order to meet its development objectives, GoM secured financing from World Bank/IDA for implementation of priority sanitation improvements in Lilongwe City as part of the Lilongwe Water and Sanitation Project (LWSP).

The objective of LWSP is to increase access to improved water services and safely managed sanitation in Lilongwe City. The preparation of a sanitation and drainage improvement strategy and master plan is one of the technical assistance activities funded under LWSP's four components.

1.2 PAST EFFORTS

Most on-site sanitation projects that are currently being implemented or have just been completed in Lilongwe City are implemented by LCC partners not by LCC as an institution. The partners includes LWB, and NGOs like CICOD, WaterAid and Habitat for Humanities. LWB is currently implementing the Lilongwe Water and Sanitation Improvements Project in partnership with LCC. Some of the current or ongoing specific sanitation projects included: -

- Lilongwe Peri Urban Water and Sanitation Project (2009-2012) with financial support from European Union;
- Assistance to Lilongwe Water Board for Implementation of a Sanitation and Hygiene Promotion Campaign in Low-Income Areas of Lilongwe City (2013-2015) with financial support from World Bank;
- Malawi Big Dig Project; Peri Urban WASH Project (2014-2015) with financial support from DFID (UK) and WaterAid;
- Extending Water Supply, Sanitation and Hygiene and Solid Waste Management services in peri urban areas of Lilongwe (2014-2016) with financial support from European Union (EU);
- School WASH Project (2017-2018)-With financial support from Habitat for Humanity Germany;
- Promotion of Ecological Sanitation at Household Level (2017)-With financial support from Habitat for Humanity Germany; and
- WASH for Healthy Learning Project (2019-2022) supported by WaterAid.

1.3 ASSESSMENT OF EXISTING SITUATION

The Lilongwe City is the capital city of Malawi where the present population of 1 million inhabitants is expected to double in the next 15 years, with a development vision for urban planning that this growth

will be made with environment, economic and social harmonization. Sanitation and drainage services remains essential public services to the population.

At present only 5% of Lilongwe's population is served by piped sewerage systems, which is a decrease from the 9% in 2010 (JICA, 2010), mainly due to the high population increase of areas not served by sewers. The remainder relies mainly on on-site sanitation systems (69% pit latrines and 25% septic tanks) (World Bank, 2017). It is estimated that 1% of the households have no access to sanitation facilities, hence practising open defecation. Pit emptying services in the LIAs are usually carried out by private services providers who usually charge high fees. LCC is currently responsible for maintaining public sewers.

Besides low customer connectivity (5%), Lilongwe's sewerage operations are constrained by inadequate treatment capacity, poor network maintenance and management. The current faecal sludge treatment capacity is just over 10% of the city's needs. With Lilongwe's population projected to double to about 2 million by 2036, there is need to increase the treatment capacities of both faecal sludge and wastewater to cater for the growing demand.

The Waste Collection Rate (WCR) in Lilongwe City is in the range of 10% to 30%, meaning that from a daily production of 500 tons to 600 tons it is estimated that a collection of 50 tons to 150 tons of Municipal Solid Waste (MSW) is done daily. This incapacity to collect the MSW produced daily makes it necessary to the population to find environmental non-adequate solutions to dispose of their waste, namely throwing the waste into the drainage systems that contribute to the stormwater drainage problems that are found in Lilongwe.

Concerning drainage, frequent flooding and stagnant waters occur in Lilongwe City. There are river floods and urban floods: river floods occur typically in zones near bridges and road culverts due to the insufficient flow capacity of those infrastructures, whereas urban floods are associated with lack of capacity of the drainage system (or even the inexistence of it). The main identified causes of these floods are obstructions that are found in the infrastructures and an insufficient flow capacity. A drainage survey was undertaken under this Project that allowed to identify approximately 597.6 km of open drains (combining both lined, unlined and natural watercourses), culverts (17.4 km) and underground stormwater drains (2.4 km) across the City (Figure 1.1).

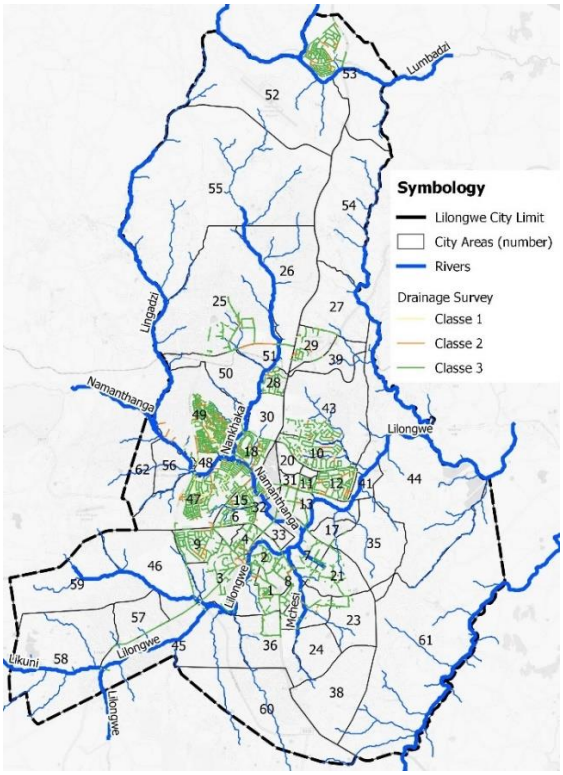

Figure 1.1 – Surveyed drainage system classification

There is a series of urban development issues that affect the drainage system, such as the observed strong tendency to encroachinto drainage system areas, mostly along natural water lines. In some extreme cases, buildings were constructed on water ways, a situation which was observed to be synonymous with smaller channels, although in some cases it was also detected in the case of wider drains (Figure 1.2). In other cases, the natural water courses were changed to make room for construction of buildings (Figure 1.3).

Figure 1.2 – Examples of buildings constructed over water ways (Area 37)

Figure 1.3 - Example of a changed natural water course (Area 49-1)

The increase of this type of constructions tends to become more dangerous as the impervious area increases and more land is claimed from the natural water lines, from where it is critical that such urban development behaviours are restrained in order to reduce the risk in these areas. Planned development with drainaged provided need to be enforced by City authorities.

The low solid waste collection rate in Lilongwe City has its side effects in the operational status of the urban drainage network. Solid waste was observed to cause problems to drainage systems with the presence of solids that interfere with the carrying capacity of the drains and result in the occurrence of localised flooding and overflowing of stormwater, as well as water stagnation. The effects are up to different levels, resulting into complete clogging, with about 40% of the surveyed culverts having some degree of silting or presence of solid waste. Figure 1.4 showcases severe cases of silted up drains found in many areas of the drainage system.

Figure 1.4 - Examples of blocked and silted sections of the drainage system

Figure 1.5 shows the location of silted culverts throughout the surveyed areas of the city.

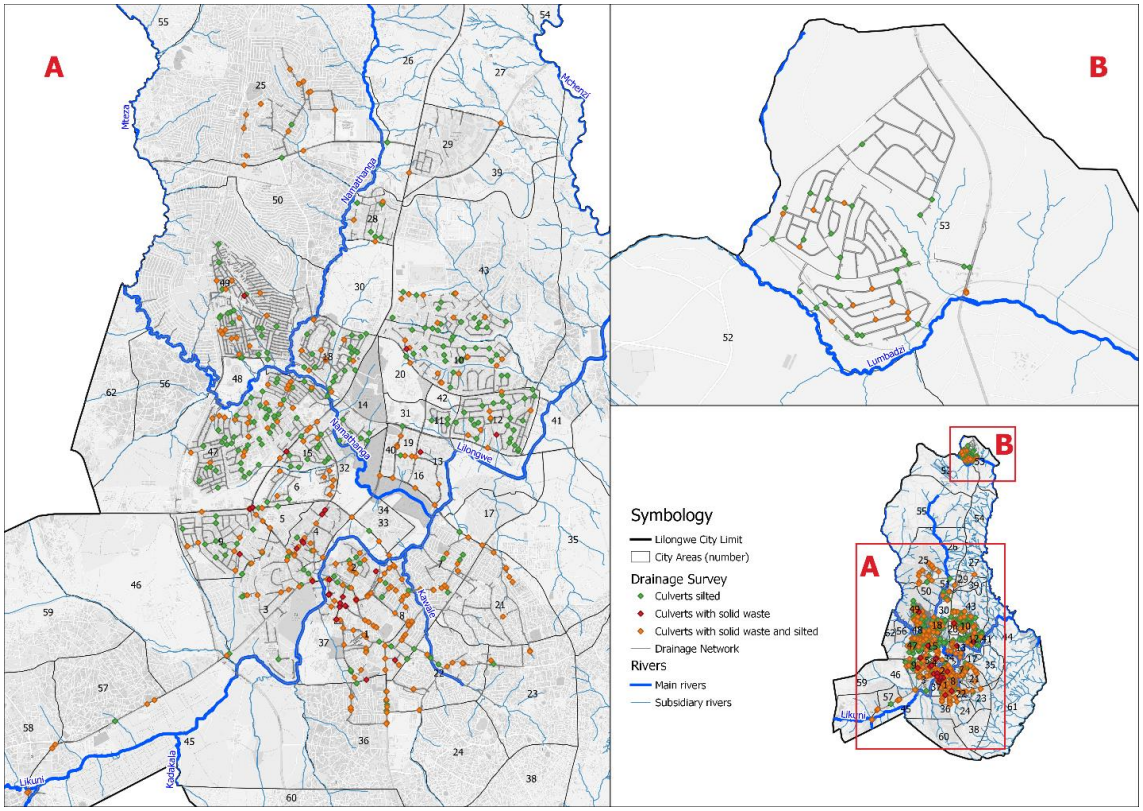

Figure 1.5 - Location of silted culverts

Covered drains exist to a small extent mainly in the older areas of the city, where there is a strong human presence and activity that makes them the more likely disposal places for solid waste. This was observed in localised stretches where the drains did not have their covers on (Figure 1.6).

Figure 1.6 - Covered drains in Old Town

In the Low-Income Areas (LIAs) in the city and in markets in the LIAs drainage is mainly not in existence. Gullies that serve as drainage are usually filled with solid waste and contain stagnated water at some times. In the unplanned settlements, road drainage structures are either non-existent or not properly constructed, thereby leading to the creation of stagnant waters, which harbour disease-transmitting organisms.

1.4 APPROPRIATENESS

In 2015 governments and the UN agreed on 17 Sustainable Development Goals (SDGs) to guide all countries as they aim to end extreme poverty, reduce inequalities and tackle climate change globally by 2030. Goal 6 aims to ensure everyone has sustainably managed safe water and sanitation. The strategy specifically aims at meeting SDG 6 target 6.2 that seeks by 2030 to achieve access to adequate and equitable sanitation and hygiene for all and end open defecation. The SDGs are relevant to this project as Malawi uses the targets and indicators to track progress on realising the goals by 2030. Specifically, goal 6 is especially relevant and can be used in setting minimum standards by which LCC and LWB can use in designing and rolling out water and sanitation in the city.

1.4.1 MALAWI GROWTH AND DEVELOPMENT STRATEGY III (2017 – 2022)

At the national level, the major guiding policy framework is the Malawi Growth and Development Strategy (MDGS) III. It emphasizes on the increased access to water resources and the enhancement of integrated water resources management at all levels. This is in support of the Sustainable Development Goal 6, which clearly acknowledges that we can only build a sustainable future if we manage our water and sanitation resources well. At the expiry of this MDGS there is going to be a successor strategy prepared to guide the national development agenda.

1.4.2 MALAWI VISION 2063 (MV2063)

The Malawi Vision 2063 has recently been concluded as a successor to vision 2020. The Vision 2063 has an aspiration of an inclusively wealthy and self-reliant middle-income country. In envisioning a healthy population of Malawians, ensuring the provision of clean water, sanitation and hygienic services have been recognized. The strategy mandates government to take the lead and rally partners and communities in promoting the adoption of safe water and sanitation practices at the individual and household level. This shall include the provision and promotion of the use of improved and accessible sanitation facilities in all public places as well as improving the management and disposal of liquid wastewater, by default human excreta, and solid waste. Water and sanitation is not one of its pillars but is mentioned as an essential public service under the enabler 'human capital'. However, there is an opportunity that the sector can be explicitly defined in the 10-year accelerator plans that will provide intermediate implementation frameworks for Malawi Vision 2063.

1.4.3 NATIONAL SANITATION AND HYGIENE STRATEGY (2018 – 2024)

The 2018-2024 National Sanitation and Hygiene Strategy (NSHS) aims to re-align Malawi's efforts in attaining universal, sustainable, and equitable access to sanitation and hygiene, and the elimination of open defecation as reflected in the Sustainable Development Goals (SDG 6: Ensuring availability and sustainable management of Water, Sanitation for all. It builds on the lessons learnt from previous sanitation and hygiene related strategies. The strategy consolidates achievements and learning of the earlier sanitation and hygiene related strategies. As such, this new Strategy outlines how sanitation sector players and development partners will work in support of government to meet the challenges in the sector. The strategy aligns with global frameworks and national-level policies.

1.5 KEY CONSTRAINTS

1.5.1 WHAT LIMITS DEVELOPMENT OF THE SANITATION SUBSECTOR

It was in 2008 when the then Ministry of Irrigation and Water Development identified the need to have a WASH Sector Investment Plan (SIP). The SIP was meant to guide the sector in the planning and implementation of sector programmes for attracting increased sector funding from Donors in the sector. With financial and technical assistance from World Bank trust fund through the NWDP the Sector Investment Plan was developed in 2012. The proposed way forward was to set up a committee to come up with 'Water and Sanitation Development Programme' to operationalize the SIP. A Programme of Work framework was developed and the 2015-16 budgets were aligned to the Programme of Work (MoAIWD, 2012) but the SIP was never rolled out. Lack of investments in the sanitation subsector has been an issue that limits development.

1.5.2 WHAT LIMITS DEVELOPMENT OF THE DRAINAGE SUBSECTOR

In the case of urban drainage of stormwater this is strongly linked to wastewater services and, in general, the two systems may be physically separate, joined or mixed. In the first case, a stormwater system can have various infrastructure components, ranging from where those rainwaters are generated up to the discharge location. In most cases, the required system includes:

- Drainage system (which has the function of collecting the stormwater trough channels or pipes and taking it to an appropriate destination).
- Retention system (which has the function of reducing the flow peaks of stormwater to avoid urban flooding and overloading the drainage and treatment systems, where necessary).
- Discharge system (which has the function of placing the stormwater in the receiving environment, suitably treated where necessary).

In urban areas the effectiveness of the stormwater drainage system is strongly affected by garbage thrown into channels and waterlines, hence Solid Waste Management is key to ensure a functioning drainage system. Therefore, drainage planning should be analysed in connection with solid waste management systems.

Regarding the land use, the main patterns in the city have been essentially maintained, when compared with the ones in 2009, for the Urban Development Master Plan. Land is mainly comprises agriculture land (52%, including commercial farms) and built-up areas (34%, of which 27% are residential). Housing development and urban sprawl is very active, particularly in the southern part. Water bodies (rivers, streams, wetlands and small reservoirs) correspond to 6.5%, and natural or naturalised areas (woodland, grassland and other open spaces and cemeteries) to more than 7%.

1.6 PURPOSE OF THE STRATEGY

The Strategy will guide city-wide sanitation planning and development towards achieving universal access to safely managed sanitation services in Lilongwe city by 2030. The strategy is anchored on a step-wise,

incremental approach to close gaps along the sanitation chain. The Strategy recognises that waste management is fundamentally linked to urban drainage, and identifies measures to address the existing gaps. The proposed strategic actions follow a three-pronged approach: i) strengthen the enabling environment for sanitation and drainage; ii) enhance demand for improved sanitation and drainage; and iii) strengthen the supply of improved infrastructure, products and services.

1.6.1 GUIDE CITYWIDE SANITATION AND DRAINAGE PLANNING

The citywide sanitation strategy encompasses the Lilongwe City Sanitation Vision, Mission, and defines the goals for sanitation development as well as strategies to meet these goals including strategies and programmes for the development of domestic wastewater services, solid waste management services; comprising of technical and non-technical aspects. The strategies cover communication and awareness, policy and regulation, institutional capacity, private sector engagement, NGO engagement, financing and tariffs, and monitoring and evaluation.

1.6.2 COORDINATED INVESTMENTS

A SWAp was implemented by the then Ministry of Agriculture, Irrigation and Water Development (MoAIWD) supported by the World Bank, UNICEF and others. A joint Project Management Unit (PMU) was established with external and deputized staff from the ministry that provided an umbrella for project-specific PMUs and served to coordinate and, to some extent harmonized, the various different projects under the National Water Development Project (NWDP II). This umbrella PMU and the SWAp support project has now been disbanded with the ending of the World Bank financed NWDP II project. The JFA was designed to open a new "pooled" funding modality for the water sector. This would complement other funding mechanisms in the sector, including Government of Malawi funds, Donor-funded "on budget" support, Donor-funded "off budget" support, and NGO projects. It would fit within efforts to have "One Water Sector Program of Work, and One Water Sector Budget" The efforts to have pooled funding has never worked to date.

The Government of Malawi (GoM) developed the National 10 Years Sanitation and Hygiene Investment Plan and Strategy (NYSHIPS) for the irrigation, water and sanitation sector that was aimed at enabling GoM to attain its vision of ensuring "Sanitation for All in Malawi" and its mission of ensuring that all people in Malawi own and have access to Improved Sanitation facilities, practice safe hygiene, reuse and/or recycle waste for the sustainable management of the Environment and Socio-economic Development".

The Investment Plan presents the investment needed in order to meet the objectives set in the National Sanitation Policy. The criteria and strategy were described in the Sanitation and Hygiene Master Plan, which was a deliverable under this same study. The objective of the Investment Plan was to quantify investments alternatives in sanitation, solid waste disposal and drainage. The funding of the Plan has not been rolled out.

1.7 SCOPE OF STRATEGY

The scope of the Strategy aims at increasing access to safely managed sanitation for all by 2030. Thus expanding the sewerage system, establishing a sustainable FSM and improve on SW collection/transport and its management. Also to reduce flooding in the Lilongwe City.

This Strategy is for City of Lilongwe and covers all aspects of the sanitation chain, namely a) containment: Households, schools, health centres, and public sanitation facilities in markets, bus depots and public places, b) emptying & transport: faecal sludge management & sewerage, and c) treatment & reuse: faecal sludge & wastewater. In addition, the influence of poor solid waste management on the drainage system is also encompassed in the strategy.

1.8 APPROACH TO STRATEGY DEVELOPMENT

The strategy was developed through a participatory and consultative approach. Preliminary work entailed a desk review of the relevant policies, legislation and institutional frameworks that guide delivery of municipal services. The existing sanitation and drainage situation was assessed, and gaps were identified. Best practices and lessons for Malawi were drawn within the region, presented and debated by key stakeholders via a series of workshops. The discussions formed a basis to develop this strategy to ameliorate the existing situation.

1.9 STRATEGY OUTLINE

This strategy is outlined in six chapters, these are:

- Chapter 1: Introduction and Analysis that includes background to the strategy, appropriateness, key constraints, purpose of the strategy, approach to the strategy development and strategy outline;
- Chapter 2: Strategies that include vision, mission and goals, Enabling Environment - strengthening institutional framework, Enhance Demand for Improved Sanitation and Drainage Services, Strengthen supply of improved infrastructure, products and services and Drainage and Flood Control Measures;
- Chapter 3: The Institutional Framework section proposes requisite change and harmonization in the law and policy. Further, it highlights attendant sector reforms at both national and institutional level to improve performance. The section also outlines two key business functions that need profiling/institutionalizing: technical and commercialization of service delivery to improve financial viability of the two sister service providers in the City of Lilongwe
- Chapter 4: Financing the Strategy, that includes Input Costs and Financing Streams for capital Infrastructure Investments including O&M costs and Human Capital: organizational;
- Chapter 5 Coordination and Monitoring Framework that includes Sector Coordination and Planning, Monitoring & Evaluation Framework and Communication; and
- Chapter 6 Implementation Plan that includes Activity, Output Indicator, Time Frame, Responsibility, Cost Estimate (USD).
- References.

2 STRATEGIES

This chapter presents the vision and mission of Lilongwe citywide sanitation and drainage in respect to the 15-year strategy horizons. It outlines the strategy goals with attendant three strategic pillars and their respective objectives. Further, it outlines the key challenges and proposes strategies, actions and a roadmap for sustained citywide sanitation services and improved drainage systems for flood control with mitigation measures to reverse the trends.

2.1 STRATEGY VISION AND MISSION STATEMENT

The Sanitation and Drainage Strategy Vision is ***"To be the most clean and green City"***, and the Mission statement is ***"To provide inclusive access to resilient and sustainable sanitation and drainage services"***. These statements bode well with Lilongwe City's Vision - ***"A future Lilongwe that is Clean, Green and Prosperous"***.

2.2 GOALS

The Sanitation and Drainage Strategy is premised on the following goals:

Goal 1: Increase access to safely managed sanitation services coverage by 2030.

Objective No. 1: Provide universal access to safely managed sanitation services to the populace of Lilongwe City.

Goal 2: Provide effective and efficient solid waste management services in Lilongwe City.

Objective No. 2: Collect and manage solid waste generated in Lilongwe City from a collection efficiency level of presently 10% to 95% by 2031.

Goal 3: Improve drainage systems, and protect buffer zones and catchments in order to control flooding in Lilongwe City

Objective No. 3: Improve drainage system and achieve a coherent stormwater and floodwater management that includes a comprehensive plan for separate and safe drainage, and achieve maximum drainage network coverage in Lilongwe City by 2036.

2.3 STRATEGY COMPONENTS

The Sanitation and Drainage Strategy is anchored on three key pillars. These are:

i. Enabling Environment – to strengthen legal and institutional framework, improve sector coordination, build capacity, enforce regulation, institute effective monitoring & evaluation framework, and roll out feedback mechanisms and communication.

ii. Create and enhance demand for improved sanitation and drainage

iii. Strengthen supply of improved sanitation infrastructure services, products and Drainage.

2.4 ENABLING ENVIRONMENT

2.4.1 SITUATION ANALYSIS

Conflicting policies and legislation: the policies and acts governing the sector are not regularly reviewed, updated, and harmonised. The institutional arrangements are also weak at policy, local and operational levels. The institutions that are responsible for the provision of sanitation and hygiene services, inclusive of faecal and solid waste management, and drainage services are struggling with institutional and operational capacity. Sector coordination is weak: there is urgent need to rejuvenate, at national level, sector and thematic working groupings and include LCC in SWG, and at local level, revive district coordination teams. There is lack of updated standards, benchmarks, targets, level of services related to quality of service, continuous follow-ups, and effective enforcement of regulations at both national and local levels. There is no independent body mandated to regulate delivery of service and in the case of improved performance to incentivise the service providers, and in the case of poor delivery sanction them. Currently Malawi lacks a WASH Services Regulator and even National Water Resources Authority (NWRA) is not operational. Sanitation and drainage sector has always been poorly funded. There is no comprehensive financing mechanism and sustainable service delivery models in place. Presently, central budget allocations are being made, however the funds are not made available as stipulated in the budget. The Sector faces challenges in financing capital infrastructure investments. At the same time the entities rendering services are not independently and financially viable: they don't charge fees hence don't collect revenues from rendered services. Currently, LCC majorly depend on subventions which are in most cases untimely and in shortfall releases to meet O&M costs, thus affecting service delivery and in long run assets are striped. The involvement of the private sector has not been fully embraced, there is a low PSP engagement, poor sanitation value chain and uptake of sanitation products, as well as effective coordination of the private sector. Lack of standards, benchmarks, targets, is still a challenge and compromises service delivery. Standards with regards to the quality of service may only exist during construction phase, however these high standards are not translated and embedded in the implementation phase for long term sustainability.

2.4.2 ENABLING ENVIRONMENT PILLAR OBJECTIVES

The Objectives of this Component are but not limited to:

- Establish and implement an effective and harmonized institutional framework and integrated legislative system.
- Undertake Sector and Institutional reforms.
- Build institutional capacity
- Improve Sector Coordination, Regulation and Compliance
- Strengthen enforcement of sanitation and drainage management systems.
- Establish transparent monitoring frameworks and governance, and

- Institute effective communication of the strategy and its implementation both vertically and horizontally within the key sector players and publics.

2.4.3 ENABLING ENVIRONMENT STRATEGIC ACTIONS

The main objectives of enabling environment strategic Actions are to establish and implement an effective and harmonised institutional framework and integrated legislative system and to build institutional capacity in the short term. Improve sector coordination, enforcement and compliance, and improve M&E framework with an effective communication among key sector players and the public. Table 2.1 outlines the Enabling Environment Strategic Actions and some of the activities.

Table 2.1 - Enabling Environment Strategic Actions

No.	Action	Description of Activities
1	Initiate and improve sector coordination groupings of key Sector players.	Rejuvenate and hold regular sector meetings to (i) agree the Sector Vision & Agenda (ii) set performance monitoring criteria (iii) draw up 5-year business plan and regularly review annual plans performance, and (iv) improve the coordination and communication among and between the following groupings i.e.: - Annual Joint Sector Reviews Workshop - Sector Working Groups - Thematic Working Groups, and - DCT - WSDPG
2	Initiate formulation and/or harmonization of policies, legislation, and institutional frameworks relevant to efficient provision of Sanitation including FSM and SWM, and Drainage Services.	• Undertake legal, policy, institutional framework reviews • Sector leads initiate drafting of relevant Bills and table to flow of Parliament or enactment of Acts. • Re-formulate and/or develop policies and institutional frameworks guided by the management option(s) and service delivery models. • SWG and TWG thru Sector communication streams disseminate policies and economic instruments for buy-in.
3	Sector Reforms and Institutional Arrangement: domesticate Sanitation and Drainage Acts and Polices	• Undertake Sector reforms and institutional arrangements. • Describe Roles and Responsibilities at: - National Sector Policy Level - Local Level - Operational Level • Operationalize Policies
4	Profile Sanitation and Drainage Functions at Operation Level	• Develop and approve Organizational Structure • Develop and set performance targets • Develop and approve Job Descriptions and Key Result Areas. • Undertake Recruitment from open market of Key Positions. • Prepare a 5 Year Business Plan, annualized with SMART Actions and Targets • Prepare Annual Plans • Prepare and Approve Annual Budget

No.	Action	Description of Activities
5	Formulate and disseminate Local regulations, Bylaws, and Standards, and performance indicators for each of the sub-sector	• Facilitate development of by-laws to regulate on-site sanitation, FSM and SWM. • DCT and Utilities develop and disseminate. • economic instruments • regulations • standards, and • KPIs and targets • LCC and LWB develop and roll out operational performance indicators
6	Undertake tariffs and tariff structure reviews and study: roll out a new tariff, levy or fees structure.	• Undertake tariff reviews • Incorporate recommendations • Seek approval from Board of Director/ Government • Disseminate Sanitation and Drainage Tariffs, Rates and Levy
7	Capacity Building and Training	• Capacity building at all stages of service delivery: planning, designing, implementation, monitoring, and decision making phases to promote transformative leadership. • Institutionalize performance management at Operational Level..
8	Advocacy and Public Awareness	• Develop IEC Materials • Public sensitization drives and campaigns including participation on radio and TV talk shows. • Hold regular public meetings places, and places of worships. • Conduct educational and career guidance talks for schools, youth and women groups. • Participate actively in WASH International and National events/days i.e. - World Water Day - Toilet Day (poo –day) - International Day of Menstrual Hygiene Promotion. - Environmental Day - etc. • Organise Competitions for Schools and Women Groups • Hold WASH Annual Dinners to recognize and award best performing LIAs, Schools and Women Groups in WASH activities.
9	Regulation and enforcement	• Set punitive measures and sanctions/penalties and disseminate. • Set aside a budget for compliance and enforcement • Institutionalize an enforcement unit. • Monitor service delivery practices and level of services. • Institute Mobile Court with a mandate to prosecute offenders within the local set-up and/or organization.
10	Monitoring Framework and Governance Communication	• At Nation and Local Level institute an M&E Team • Develop an M&E framework and mechanism. • Design a monitoring and check-list template. • Set response time target. • Develop and run a WASH website • Actively engage the publics on social media. • Develop and roll out a PR feedback mechanism digital system. • Publish the JSR Annual Report • Bi-annually publish Sector performance in news print.

No.	Action	Description of Activities
11	Provide Technical Assistance and Support to the Strategy Pillars	• Develop and Support Key Sector Development in following areas: - Establish a comprehensive MIS framework and roll out - Assist in the establishment of QMS & EMS - Provide utilities (LCC & LWB) with systems, equipment, tools& transport - Establish Asset Management Systems - Provide Technical Assistance in key positions: Technical and Business Streams to improve Financial Viablity of LCC and LWB. • Facilitate Benchmarking and implementation of novel approaches. • Establish a Call Centre with free toll telephone numbers.

2.5 ENHANCE DEMAND FOR IMPROVED SANITATION AND DRAINAGE

2.5.1 ENHANCE DEMAND FOR IMPROVED SANITATION

SITUATIONAL ANALYSIS

The assessment of the existing situation revealed that Lilongwe's sewerage coverage is estimated at 5%, of which 71% is the Kauma sewerage catchment. The rest of Lilongwe's population is reliant on on-site sanitation systems of varying quality. The technology split for OSS systems is 69% pit latrines; 25% septic tanks. Low-income areas are in particular dominated by traditional, unimproved pit latrines. Inadequate access to handwashing facilities is common in low-income areas, while the City's public schools are characterised by a high pupil to toilet stance ratio. It was also established that the sanitation and hygiene sub-sector is unregulated, and enforcement is largely defective.

As the bulk of LCC's resources are committed to solid waste management, there is hardly any support for sanitation and hygiene improvements. **This section proposes measures to enhance demand for improved sanitation and hygiene**. The objectives to be achieved are presented, and strategic actions to improve the current situation are discussed. The demand-related actions range from regulation enforcement to promotional activities to market development to public incentives for sanitation improvements.

Of the 69% of Lilongwe's residents served by OSS systems, 28% of the population use traditional, unimproved sanitation facilities. These households are the primary target group for the proposed actions. The other crucial target group are the pupils in Lilongwe's primary public schools that have an under-supply of improved sanitation and hygiene facilities; thus, compromising the pupils' right to a healthy learning environment.

Due to the weak demand and a nascent sanitation market, the strategic actions for demand creation and/or enhancement are a series of complementary social and commercial measures – designed to improve the targeted hygiene and sanitation behaviours. The demand-enhancement actions will follow a step-wise, incremental approach. For instance, it is not expected that Lilongwe city's households currently served by unimproved latrines can make an overnight leap to sewerage services. Nonetheless, improvement from unimproved to lined pit latrines to septic tanks and/or sewerage connections over a 10 to 15-year horizon is possible. The step-by-step progressive improvement.

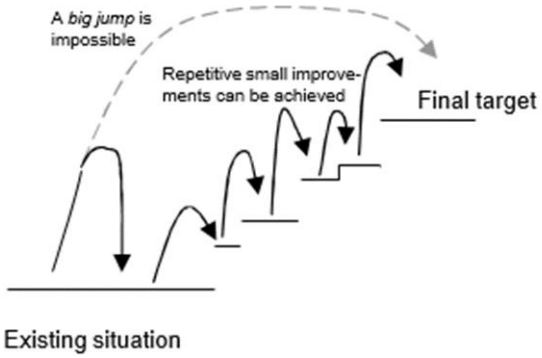

Figure 2.1 - Step by Step Progressive Improvements

Table 2.2 - Baseline and Targets

Indicator	Baseline Value	Target by 2030
Percentage of Lilongwe city population with access to improved sanitation facilities	71%[2]	100%
Percentage of Lilongwe city households with access to handwashing facilities with soap and water	19%[3]	100%
Percentage of Lilongwe city households practising open defecation	1%	0%

STRATEGIC ACTIONS

The strategic actions to drive demand for improved sanitation and promote hygienic practices are presented in Table 2.3. A description of attendant activities is also provided.

[2] World Bank, 2017. Lilongwe Water and Sanitation Project – Project Appraisal Document.
[3] LWSP, 2021c. Onsite Sanitation Systems (OSS) Feasibility Study Report, – Authoured by SWS / L.Gravan / Infracon Joint Venture.

Table 2.3 - Demand for Sanitation Strategic Actions

No.	Action	Description of Activities
a. Sanitation (onsite and offsite)		
ED.1	Awareness raising and sanitation marketing	Develop and implement a **citywide sanitation and hygiene marketing campaign**. The campaign should target households, schools, health centres, public spaces and other institutions to increase adoption of improved hygiene practices, and compliance to Lilongwe's sanitation and housing laws. The key messages including promotion materials will introduce and promote uptake of: • Improved sanitation products and services – including safe pit-emptying • Handwashing with soap, menstrual hygiene management and other good behavioural practices • Lilongwe's sanitation bylaws and minimum housing standards • Appropriate solid waste management practices prioritizing waste separation at household level The campaign will be implemented via multiple communication channels: • Interpersonal communication (small groups, individuals) • Direct consumer contact (promotional events, educational entertainment) • Mass media (TV, radio, print, mobile phone) The marketing campaign should be conducted in partnership with civil society and private sector actors.
ED.2	Market development	**Financial Products** In partnership with financial institutions, develop financial products tailored towards sanitation and hygiene improvements at household level. ***Entrepreneurship*** • Identify masons to form a pool of small entrepreneurs, who will offer the complete service of construction or improvement of sanitation facilities. • Support the entrepreneurs with technical, marketing and business-oriented training to scale-up Lilongwe's sanitation economy. • For the most motivated and promising entrepreneurs, continuous business support and mentorship should be provided. The entrepreneurs' services should also benefit from the sanitation marketing campaign.
ED.3	Regulation enforcement	Due to weak demand and a nascent sanitation market, enforcement of regulations and bylaws is necessary. Coupled with demand-enhancement activities, enforcement will curb undesirable behaviour/practices. The role of community leaders and field inspectors should be strengthened to enforce compliance to Lilongwe's sanitation and housing standards, and bylaws.
ED.4	Public incentives	***Partial Subsidies*** Private financing is insufficient to fill the financing gaps of low-income households seeking to move up the sanitation ladder. Working with financial institutions, there is need to design partial subsidies for vulnerable households to fill the financing gap for construction or improvement of sanitation facilities. The partial subsidies could be realised via: i) publicly-funded guarantees for interest-free sanitation loans; ii) sanitation revolving fund; and iii) output-based subsidies. ***Output-based Approach*** The level of subsidy can be varied depending on the type of improvement, but an output-based approach is ideal: households should be visited before and after the works. NGOs and sanitation entrepreneurs should be involved in the design and implementation of the subsidy scheme.

2.5.2 ENHANCE DEMAND FOR EFFICIENT AND EFFECTIVE SOLID WASTE MANAGEMENT

SITUATIONAL ANALYSIS

The final Solid Waste Disposal Site (SWDS) is not a properly engineered site as it is neither built nor managed according to acceptable standards. The SWDS should be rightly classified as an open dumpsite. The final disposal site sits on 25ha and can receive 20,750 tons of MSW per month. However, only 6ha of the area is in use. The site does not have waste processing infrastructure, and lacks facilities to prevent waste from being washed away and/or blown away. As the site lacks a liner at its bottom, the leachate likely infiltrates into ground and surface watercourses, causing water and soil pollution. In addition, during the rainy season access by trucks is difficult. This is due to the unpaved access road.

Solid waste management challenges include, but not limited to:

- Low waste collection rate.
- Threat to public health and the environment.
- Release of toxic emissions in the atmosphere due to burning of waste.
- Blocked drains thus flooding, and vectors breeding resulting in the spread of diseases.

Table 2.4 - Strengthen Supply of SWM Baseline and Targets

Indicator	Baseline Value	Target by 2036
No. of equipment provided	0	Equipment for waste segregation provided 10
No. of transport system provided	0	Segregated waste transport systems provided 6
Number of waste treatment facilities established	0	Waste treatment facilities established 2
No. of upgraded Engineered Sanitary waste management facilities	0	Waste management facilities upgraded 2
No. of appropriate waste collection Receptacle facilities provided	4	Adequate and appropriate collection Receptacle facilities provided 12
No. of appropriate waste disposal transport systems provided	2	Appropriate transport systems provided 6

THE DEMAND FOR SOLID WASTE MANAGEMENT SERVICES

To achieve the above targets the following strategic Actions are recommended, Table 2.5:

Table 2.5 - Enhanced Demand for SWM Services

No.	Strategic Action	Description of Activities
ED.1	Circular Economy	Adherence to waste Hierarcyin Line with 4Rs Principles Improving the Waste Management system through applying the Waste Hierarchy principles Collection and Transportation i) Improve efficiency of Solid Waste collection and transportation. ii) Reach 95% of population served by 2036 iii) Outsource 50% of all solid waste collection, focusing on residential collection. iv) Develop collection, sorting and recycling opportunities, to reduce costs and volumes. Application of Instruments Applying the Administrative Instrument of Separation at Source and the Informative instruments of campaigns to residents for behavioral change. Promote Waste Treatment and Waste disposal Facilities i) Promote waste treatment before disposal and establish waste treatment facilities ii) Conduct a Environmental Basic Assessment for the upgrade of the Area 38 dump site by 2022. iii) Reach 100% Upgrade to Engineered Sanitary of existing solid waste disposal site by 2025. iv) Conduct a full Environmental Impact Assessment (EIA) for the new landfill site in the selected Area by 2027. Reach 100% construction of new Enginneered Sanitary landfill by 2030 (after new iii). Extend treatment to selective collection system by 2036.
ED.2	Social Improvement	Formalization of Association of Waste Pickers (Scavengers) i) Have a characterization on and study of the scavenger sector by 2025. ii) By 2025, formalize the association of Waste Picker (Scavengers) presently working in the Solid Waste Dump Site (SWDS) in Area 38, Lilongwe, thus consider prioritization of the waste Picker (Scavengers) group when recruiting for the enhanced increase in the labour force. iii) Integrate 100% of scavengers into Solid Waste Management work structure by 2025
ED.3	Build capacity by intilling a sense of belonging towards SWM	Intensify Recruitment of Workforce Strengthen the full time employed workforce up from 22 employees in 2020 to a total of about 528 staff in 2036: of which 154 are drivers , including the auxiliary workforce of a) 320 engaged in collection processes, and b) 12 drivers and 42 auxiliary engaged at Landfills.

2.5.3 ENHANCE DEMAND FOR ADEQUATE DRAINAGE SERVICES AND FLOOD CONTROL

SITUATIONAL ANALYSIS

Adequate drainage system is required in Lilongwe City to dispose safely the excess water (including stormwater) and wastewater to ensure public health, prevention of environmental pollution, and to protect property from flood damage.

Flooding occurrence in Lilongwe City constitutes river flooding and urban stormwater flooding. The flooding is typically experienced in zones near bridges and road culverts due to insufficient flow capacity as a result of under-sized drainage pipes and channels, reduced discharge capacities as a result of infrastructure damage, solid waste and siltation which are exacerbated by the general lack of maintenance of the infrastructure. The capacity of the existing drainage infrastructure was significantly reduced by solid waste dumped in drainage infrastructure. Assessment of the existing situation showed that up to about 40% of the surveyed culverts were having some degree of silting or presence of solid waste which significantly reduced the carrying capacity.

(a)  (b)  (c) 

Figure 2.2 – (a) Cases of erosion along City roads, (b) solid waste dumping in culverts, and (c) silted up road culverts

Figure 2.3 - Effects of river and urban flooding © Nyasatimes, 11th January 2019, photo: Roy Nkosi

Table 2.6 - Enhancing drainage and flood control demand targets

Indicator	Unit	Baseline Value	Target Value	Target by (Year)
Awareness campaign on preservation of buffer zones and the risks of encroachments through mass media and communication products.	Quarterly	0	5	2022
The importance of drainage infrastructure and the ills of improper solid waste disposal awareness Campaign	Quarterly	0	5	2022
Awareness raising undertaken on the need for improved drainage network in informal settlements.	Settlements	0	7	2022
Urban land management stakeholder's consultation on urban land administration undertaken.	Quarterly	0	5	2022

Indicator	Unit	Baseline Value	Target Value	Target by (Year)
Rainwater harvesting from roof tops awareness and water reuse campaign and knowledge sharing undertaken.	Quarterly	0	5	2022
Percentage of households and establishments resettled from buffer zones and drainage infrastructure land.	%	0	100	2030

STRATEGIC ACTIONS

Table 2.7 summarizes the Drainage Strategic Actions.

Table 2.7 - Drainage Demand Strategic Actions

No.	Action	Description of Activities
b. Drainage		
ED.1	Mitigate environmental and public health impacts through public awareness and involvement.	Create awareness on the impact of improper solid waste disposal on drainage systems and promote business opportunities in solid waste management for economic capacity: • Engage private sector on the roles they could play in service delivery and the business opportunities in the service chain. • Undertake inclusive planning with the involvement of the civil society and the private sector players and implement solid waste management in the City.
ED.2	Promote rainwater and floodwater harvesting for water reuse and to reduce runoff in the City.	• Promote rainwater harvesting from roof tops in the city for various uses such as flower gardening, lawns watering, car washing, etc.
ED.3	Increase customer satisfaction through responsive drainage services.	Ensure timely response to public complaints, notices or inquiries regarding drainage conditions and problems: • Establish a call centre with dedicated staff to cater for customer feedback for all municipal services.
ED.4	Reduce the risk of flooding for private property and public spaces arising from both stormwater and flooding rivers.	Set riverine and streams buffer zones along the natural water courses and undertake public awareness campaigns on the same.
ED.5	Provide for sustained engagement and solutions for city land use, addressing the emergence of unplanned settlements and encroachment into reserved service areas.	• Undertake awareness on laws relating to illegal development and developments in fragile and sensitive areas, and on land reserved for public services. • Enforce land use plans and relevant laws, stopping new settlements in protected areas and reclaim the encroached land areas.

2.6 STRENGTHEN SUPPLY OF IMPROVED INFRASTRUCTURE, PRODUCTS AND SERVICES

2.6.1 STRENGTHEN SUPPLY OF IMPROVED SANITATION

SITUATIONAL ANALYSIS

As intimated in the previous section, the existing sewer network serves only 5% of the current population of Lilongwe city. The bulk of the city's population depends on on-site systems (OSS) to meet their sanitation needs. The OSS technologies vary both in structure and quality. By and large, the OSS in Lilongwe are not safely managed and offer negligible protection for public health, the urban environment and water resources. In particular, collection and safe disposal of faecal sludge from the on-site sanitation facilities is deficient.

The emptying of OSS facilities is mainly done by private operators. The eight formal operators in the city chiefly provide FS emptying services to Lilongwe's middle and high-income residential areas with septic tanks and lined pits. Informal operators, who largely use rudimentary manual methods, offer FS emptying services in LIAs often inaccessible to mechanical systems (vacuum trucks or cesspool emptiers). Nonetheless, the crude methods (gulpers, buckets, and so on) they deploy are far from hygienic – and are a health hazard as the faecal sludge removed from latrines is often discharged directly into the urban environment.

There is need to develop and regulate Lilongwe's FSM sector. There is necessity to lower FS transport costs as much as possible to make pit-emptying affordable. In the present situation, most people in low-income areas cannot afford the cost of hygienic, mechanical pit-emptying services. The establishment of decentralised FS dumping points would go a long way in reducing the cost of FS collection and transport.

In Lilongwe, faecal sludge can only be dumped at Kauma WWTP. The plant is designed to receive FS volumes of up to 72 m^3/day. This is inadequate to meet the Lilongwe's current and future FS treatment needs. The city's daily FS generation rate is currently estimated at 645m^3/day[4]. This is expected double in the next 10-15 years. Thus, there is exigent need to increase the FS treatment capacity. In the short-term to medium-term, identification and prioritisation of co-treatment options could be explored.

The city's sewer network covers approximately 128.5 km, of which 71% is the Kauma sewerage system. Sewerage operations are constrained by inadequate staffing and technical expertise. The city's seven sewerage treatment plants are not in good condition due to inadequate maintenance and management. Sampling and testing at KIA, Lumbadzi, Kanengo and Kauma WWTPs revealed that, in some parameters, the final effluents did not meet Malawi's effluent quality standards which are some of the most

[4] LWSP, 2021a. Assessment of the Existing Situation. Volume 2: Annexes – Detailed Assessment, Authored by Engidro *et al*.

restrictive in the world. The shortcomings point to system inefficiencies and/or failure of the WWTPs to properly treat the wastewater they receive.

Additionally, gaps were identified in relation to sanitation in public primary schools, health centres and public spaces. This Strategy proposes measures to address the aforesaid gaps.

Table 2.8 - Improved sanitation Baseline and Targets

Indicator	Baseline Value	Target by 2030
Improved Wastewater Treatment Capacity	9,000 m^3/day[5]	40,600m^3/day
Improved faecal sludge collection efficiency in LIAs	N/A	100%
Improved treatment capacity for faecal sludge	72 m^3/day	1,095 m^3/day
Improved sanitation and hygiene in all markets and other public places	N/A	100%
Improved pupil to stance ratio	1:200	1:60

STRATEGIC ACTIONS

Table 2.9 - Strengthen Supply - Sanitation Strategic Actions

No.	Action	Description of Activities
SS.1	Standardise technology options	***Containment*** Develop a catalogue with upgradeable, low-cost sanitation products. The products should be tailored to the needs of low-income areas, and easily produced locally. The options could include pre-cast sanitation products, pre-fabricated modular toilets, and so on. Product development should be continuous as consumer needs evolve.
SS.2	Improve the existing facilities	***Sewerage*** • Rehabilitate and expand the sewer network as planned within the project component "Priority sewerage investments to be implemented under LWSP." • Rehabilitate and increase the capacity of the three main wastewater treatments plants (Kauma, Lumbadzi and Kanengo).
		Schools Develop and implement a citywide plan to rehabilitate sanitation and hygiene facilities in public primary schools – including menstrual hygiene management facilities. The plan should be beefed up with an increase in the public budget for WASH in schools to meet recurrent O&M needs.
		Health Centres Develop and implement a citywide hygiene and sanitation improvement campaign to cover all public health centres.
		Public Toilets Strengthen the current pay-per-use model by introducing and enforcing affordable tariffs, operations protocol, and O&M plans. Hygienic facilities attract users, and keep the sanitation businesses afloat.

[5] LWSP, 2021a: Assessment of the Existing Situation. Volume 2: Annexes – Detailed Assessment.- Authored by Engidro *et al*.

No.	Action	Description of Activities
SS.3	New infrastructure investments	***Simplified Sewerage and Decentralised Treatmen*** Identify areas where decentralized wastewater treatment systems (DEWATS) can be established and rehabilitate existent ones (Kamuzu and KIA), and develop the same. DEWATS and other simplified sewerage systems would offer low-cost sanitation options for Lilongwe's populated areas where simplified sewerage system may be implemented.like condominial areas.
		FS Treatment Design and establish new faecal sludge treatment plants (FSTP) with capacity of 1,095 m^3/day. Kanengo, Ngwenya and West Side are the proposed locations for the new FSTPs. It is also proposed co-treatment of faecal sludge with wastewater in Lumbadzi and Kauma WWTPs. Synergies with and solid waste should also be explored with Pilot projects to identify new feasible co-treatment options.
		Schools Develop and implement a citywide plan for supply of new sanitation infrastructure to meet the national target pupil to stance ratio of 60:1. The plan should occasion supply of adequate hygiene facilities – including menstrual hygiene management facilities.
SS.4	Improve efficiency of FS collection and transport	***FS Collection Capacity*** Procure and deploy vacuum suction tankers and vacutag trucks to enhance the pit-emptying capacity in Lilongwe City. The latter will be deployed in low-income areas, which are often inaccessible to vacuum trucks. The FS collected by vacutags will be either transported to transfer stations (mobile or fixed).
		FS Transfer Provide transfer stations (mobile or fixed) at strategic locations to reduce the cost of FS collection and transport.
SS.5	Capacity Building and Training	**Entrepreneurs** The innovative and most-promising entrepreneurs should be given continuous business support services. This should be output-based. For instance, no. of improved sanitation facilities the entrepreneur built within a specified period.
		FS Collection and Transport Develop tailor-made training modules for private pit-emptiers to professionalise and regulate FS collection and transport. The modules should include Standard Operating Procedures (SOPs) to regulate the pit-emptying sector. Only operators that have undertaken the training(s) should be permitted to discharge at the FSTPs. The operators should also benefit from demand-enhancement activities that market and promote safe pit-emptying services.

2.6.2 STRENGTHEN SUPPLY FOR SOLID WASTE MANAGEMENT SERVICES

SITUATIONAL ANALYSIS

Municipal Solid Waste (MSW) production in Lilongwe is estimated at 0.6 kg/capita/day which, with the city's population estimate of 1.1 million, amounts to 660 tonnes per day. LCC's waste collection rate is estimated at 10-30%, which is significantly low. Lilongwe's residents dispose uncollected waste in multiple ways – from burning to dumping the waste in water ways (rivers, streams, storm water drains, sewers, and so on). Many households throw their solid waste in pit latrines, which renders FS emptying difficult as cited in the preceding section. The low MSW collection rate and indiscriminate disposal pollutes the urban environment and chokes Lilogwe's drainage systems.

Table 2.10 - Strengthen Supply of SWM Baseline and Targets

Indicator	Baseline Value	Target by 2030
Number of companies, institutions and community groups who have embraced waste treatment	10	Waste treatment promoted 50
No. of people sensitized	3 Section areas of Lilongwe 30%	A sensitized public on responsible waste management of all Section areas of Lilongwe 95%
No. of campaigns	10 per year	Awareness created on suitable waste management options 60 per year
No. of people trained	10,000 by 2021	Public trained on integrated waste management 250,000 by 2030

The main objective of the strategy if to improve waste collection rate from the present 10% to 95% in 2031 and beyond.

Table 2.11 - Strategic Actions for Strengthen Supply of SWM Activities

No.	Action	Description of Activities
SO 1: Education and Awareness promotion		
1		• Raise awareness and capacitate the cadres responsible for SWM issues in the Lilongwe City Council and relevant Agencies, including other stakeholders such as the Lilongwe Water Board
SO 2: Mobilise resources from local sources		
2		• Waste Collection Fees to be included in the Rates billing system but should be channelled directly to the Waste management activities
3		• Private Operator gets a Waste Management operation License from the LCC who pays for this License to the LCC in the process;
4		• The Waste Management Services Fees could also be paid on Water Bills (LWB) in future.
5		• The LCC should start collecting Waste Dumping fees at the gate of the Landfill site;
SO 3: Mobilise Resources from International Sources.		
6		• Galvanise efforts to raise funds from International Donor fraternity
SO 4: Education and Awareness promotion.		
7		• Raise awareness and capacitate the cadres responsible for SWM issues in the Lilongwe City Council and relevant Agencies, including other stakeholders such as the Lilongwe Water Board

2.6.3 DRAINAGE AND FLOOD CONTROL MEASURES

SITUATIONAL ANALYSIS

The assessment of the existing situation in Lilongwe City on urban drainage status identified the nature of drainage network in the City, undesirable conditions and challenges to be overcome through strategic actions. A drainage survey undertaken in Lilongwe City under the Lilongwe Water and Sanitation Project

in 2020 identify approximately 597.6 km of open drains; which includes lined drains (369.4 km), unlined drains (159.5 km) and natural watercourses (68.7 km) across the City. Underground stormwater drains were established to be 2.4 km and drainage culverts 17.4 km. Other drainage infrastructure in the city include detention and retention ponds which are meant to hold the excess water to avoid flooding. The drainage system in the city is principally road drainage and natural water courses. Reliance on road drainage is not adequate in the event of high stormwater and river flooding into the urban areas. In the peri-urban areas, drainage systems are either non-existent or in poor shape with several problems of drains being clogged with solid waste.

(a) (b) (c)

Figure 2.4 - (a) City road drain (b) unpaved city road with unlined drains and (c) flood retention pond

Table 2.12 - Supply of improved Drainage Infrastructure Baseline and Targets

Indicator	Unit	Baseline Value	Target Value	Target by (Year)
Retention and detention basins/ponds implemented.	No.	2	4	2030
Improved drainage network in informal settlements in Mchesi, Kawale, Biwi, Chilinde, Area 25, Chinsapo and Chigwirizano.	Settlements	0	7	2030
City drainage network mapped, coded and database with MIS in place.	%	0	100	2022
Rainwater harvesting piloted in 10 public schools and 10 market structures.	No.	0	20	2025
Rivers and streams with trained and protected banks (Lilongwe, Lingadzi, Mchesi, Namanthanga).	No.	0	4	2025
Bi-annual maintenance of drains and culverts undertaken regularly from 2022.	Bi-annual	-	13	2036
Existing open drains fully lined.	km	369.4	528.9	2025
New drainage infrastructure developed:				
Drains	km	600		2036
Culverts	No.			2036
Road-crossing structures at culverts and bridges protected against erosion and scouring (across Mchesi, Lingadzi, Lilongwe rivers) and capacity increased	Sites	-	6	2030
River gauging instruments reinstated into working order to provide accurate and reliable data for flood estimation.	Stations	-		2022

DRAINAGE AND FLOOD CONTROL STRATEGIC ACTIONS

Table 2.13 - Strengthen supply of improved infrastructure – Drainage Strategic Actions

No.	Action	Description of Activities
SO 1: Ensure Environmental Health and Well Served City Residents For Healthy Living Conditions.		
1	Mitigate environmental and public health impacts from combined sewers and drainage overspills.	Ensure well maintained infrastructure with zero spillage through: • Well-resourced LCC and relevant government entities to enforce laws on waste disposal and illegal dumping of solid waste. • Drainage and sewer infrastructure maintenance.
2	Pilot rainwater and floodwater harvesting for water reuse and to reduce runoff in the City.	Undertake rainwater floodwater harvesting in public infrastructure: • Assess the costs and benefits of rainwater and floodwater harvesting for water reuse. • Implement rainwater harvesting in 10 public schools and in 10 market structures. • Construct detention/retention ponds to collect flood waters.
3	Drainage Services O&M and new infrastructure provided with a budget to enable attainment of goals and customer satisfaction.	Explore and employ city services financing streams to meet service delivery financial requirements to meet O&M and new infrastructure development in each FY up to 2036: • Seek legal opinion on legally acceptable revenue sources and seek direction for their implementation. • Review municipal services financing structure and provide a drainage services budget in each FY Budget up to 2036. • Dedicate staff to undertake project proposal writing for small grants and investment financing. • Prepare financing plan and budget, and lobby government to provide matching funds alongside institutional structuring for effective customer focused service delivery starting with FY 2021-2022. • Seek external development financing supported by project proposals for grants and borrowing with government support.
4	Apply and ensure a fair and equitable tariff structure that supports the necessary drainage services initiatives and ensure value for the tariff paid.	• Engage stakeholders on the need for regulations relating to drainage services and urban waste water management. • Lobby for the preparation of missing regulations, including Tariff Setting Regulations and. • Set and apply tariff to un-tariffed services such as sewerage, drainage and solid waste management by.
5	Creating and maintaining the best possible motivated workforce in terms of work safety, productivity, customer service, employee welfare and training.	Review LCC departmental roles and undertake restructuring and re-assignment of roles for effective delivery of services and sustained financial capacity: • Undertake stakeholder consultations on the roles and best governance structure for City Assemblies. • Undertake institutional restructuring for effective customer focused service delivery with reassigned departmental roles. Undertake staff capacity building: • Engage other Cities in the region and elsewhere and establish City-to-City twining and undertake annual staff exchange for exposure and on-the-job training. • Undertake training needs assessment and budget and implement the necessary training for the immediate, medium term and long term targeting performance improvement.

No.	Action	Description of Activities
SO 2: Ensure Resilient and Sustainable Drainage Infrastructure		
6	Reduce the risk of flooding for private property and public spaces arising from both stormwater and flooding rivers.	Define, set and protect natural water courses buffer zones and flood protection areas along rivers crossing the city: • Enforce laws that prohibit cultivation and any form of activity that destabilize the natural watercourses buffer zones and their catchment. • Seek evacuation of all developments within the buffer zone. Plan and implement flood protection measures across the City: • Construct flood detention and retention ponds across the City and provide for water reuse.
7	Implement projects to manage the potential impacts of climate change through adaptation of current Climate trends in drainage infrastructure upgrading/expansion and new drainage infrastructure development.	Develop City stormwater drainage infrastructure to attain maximum coverage of the storm water drains by 2036: • Undertake feasibility and preliminary design for the implementation of City drainage infrastructure. • Prepare detailed design for city drainage works. • Tender and implement new construction works.
8	Undertake proactive maintenance, rehabilitation and replacement of infrastructure coupled with increased monitoring, inspection and assessment of their condition and their reserved land.	Clean-up all existing drainage structures of silts and solid waste, rehabilitate and undertake regular maintenance: • Provide equipment and tools for maintenance of city drainage infrastructure and undertake the works. • Assess the existing drainage infrastructure for rehabilitation and connectivity to main drainage infrastructure and natural water ways. • Undertake rehabilitation of existing drainage infrastructure to restore carrying capacity.
9	Enhanced infrastructure data collection and mapping and application of the data gathered in asset management, planning, design, construction, and maintenance.	Map drainage network in the city and code each system and its structures: • Undertake city drainage mapping. • Prepare infrastructure database and information management system (MIS).
SO 3: Ensure Effective Governance Capacity for Effective and Efficient Service Delivery		
10	Provide for enabling environment with harmonised Laws and Policies for enhancing performance, coordination and effective inter-sectoral participation.	Undertake legal and policy review harmonise and streamline service delivery to ensure accountability, avoid abrogation of responsibility and to ensure adequacy and relevance of policies and laws to present day situations: • Undertake stakeholders' consultations to understand the operations and services constricted by the existing legal and policy framework, and for consensus on the required changes. • Lobby for the review and update of the legislation that governs the existence and the operations of Local Authorities to clearly assign drainage services delivery mandate, solid waste management and sanitation services within the City areas. • Lobby for the preparation of missing regulations alongside the law review. • Seek government support for legal and policy review. • Engage sector players with the objective of continuous collaboration, coordination and information sharing, and setup a working platform for continuous collaboration and information sharing.

No.	Action	Description of Activities
11	Provide for sustained engagement and solutions for city land management and administration, addressing the emergence of unplanned settlements and encroachment into reserved service areas.	Engage Lilongwe urban and peri-urban land administrators to review land use challenges in the light of municipal services delivery, arising from land allocations and support sustainable land use planning with land for drainage infrastructure secured: • Establish an effective land governance arrangement for all land administrators in the urban and peri-urban areas of Lilongwe City that would avoid misallocation of land. Upgrade existing informal settlements with drainage and other service infrastructure provided, and prevent development of new informal settlements: • Assess the existing informal settlements for upgrading. • Update urban plans and secure land reserved for services infrastructure. • Prepare informal settlement upgrading project proposal for seeking financial support. • Seek financing for upgrading of informal settlements with municipal services and communal facilities provided for a healthy living environment.

3 INSTITUTIONAL FRAMEWORK

Malawi's institutional framework for the WASH sector is centred around the Ministry responsible for Water Development, five parastatal water boards (WBs) of Blantyre, Southern Region, Lilongwe, Central Region and Northern Region, The Ministry of Local Government through City, Town and District Councils, and the Ministry of Health. The Ministry of Education, Science and Technology is involved in the implementation of WASH activities in schools. A variety of other actors including NGOs, CBOs, and donor agencies are also involved in planning, financing, and improving access to sanitation and hygiene services in low income communities.

3.1 LEGAL AND POLICY

The Water Act of 1995, vests the responsibility of managing water services in the water boards, while the responsibility of managing sanitation and hygiene, especially onsite sanitation, lies with the City Councils. The National Sanitation Policy 2008 reinforces these mandates by outlining the responsibilities and mandates of all key sector role players involved in water supply, sanitation and hygiene. However, due to some conflicts in the Water Act and Local Government Act regarding the operations of off-site sanitation, the National Sanitation Policy 2008 is undergoing review. The recommendations from the ongoing reviews will motivate and hasten the harmonization of the Water Act 1995 and the Local Government Act 1998 related to the management of the off-site sanitation – centralized waterborne sewerage systems. In the same vein, faecal sludge management (FSM), solid waste management, and drainage must be explicitly detailed in the Acts. In the meantime, the operations of the Lilongwe City sewerage system are to be transferred to Lilongwe Water Board from LCC in accordance with the LWSP financing protocols.

3.2 INSTITUTIONAL ARRANGEMENT FOR LILONGWE CITY

Presently, the National Sanitation Policy outlines institutional roles and linkages to manage sanitation and hygiene services in the country. The institutions are the Ministries responsible for Sanitation Affairs, Water Affairs, Local Governments (District, Town, Municipal and City Councils), Education, Natural Resources (Minerals, Forestry, Fisheries, Environment, Tourism, Water), and Health Affairs.

In the City of Lilongwe, the following institutional arrangement to manage Sanitation and Drainage sub-sector is envisioned to include but not limited to :

- LWB to be responsible for water supply, O&M of sewers, operations of the wastewater and faecal sludge treatment plants and safe disposal of effluents and/or reuse of the resources.
- LCC to be responsible for drainage, faecal sludge and municipal solid waste collection and transportation from public places and institutions, LIAs, whereas waste collection from private premises by private sector is highly recommended.
- Industrial and Hazardous waste, other than municipal waste, shall be collected and managed by specialized and permitted entities off-site at gazetted waste treatment plants. The O&M of these

sites must be in accordance with Regulations (to be developed) and monitored by the Regulator and/or EAD & NWRA.

- All liquid industrial waste within the City shall be separately treated and discharge to the environment in accordance with the effluent disposal standards on land or unto water bodies. The industry, responsible to generate wastewater, must develop a 24-hour monitoring mechanism at their own cost interfaced by the regulator and EAD. Where the trade or industrial wastewater must be connected to the municipal/city centralized sewerage system, the proprietor must install a pre-treatment facility, with approval of the DWSS, Regulator and/or EAD for the pre-treatment of wastewater to meet required effluent standards into sewers in accordance with the Sewerage Regulations (to be developed).

The institutional arrangement for the management of Sanitation (on-site and offsite) in Lilongwe City is illustrated in Table 3.1. Whereas the solid waste and drainage management in the City is presented in Table 3.2.

Table 3.1 – City of Lilongwe Onsite & Offsite Sanitation Institutional Framework – Key Stakeholders

Onsite & Offsite Sanitation Sector Chain - Institutional Framework - Key Players & Stakeholders										
		Behavioural Change Aspects	Toilet (Capture and Containment)				Conveyance		Treatment/ Disposal	Reuse
#	Function Attributes	*Hygiene Promotion*	*Household Sanitation*	*Schools/Educational Institutions*	*Health care Facilities*	*Public Facilities: Public Toilets, Markets, Bus & Taxi Terminus, Stadia, etc.*	*Faecal Sludge Emptying/Collection / Transport*	*Sewer Network*	*Treatment and Disposal of Faecal Sludhe & Wastewater effluents.*	*Safe beneficial reuse: Sanitation Products and Services.*
1	Policy	LCC/MoH	LCC/MoH	LCC/MoE	LCC/MoH	LCC/DWSS/MoLG	LCC/EAD/	DWSS/LWB	DWSS/LWB/EAD	EAD/DWSS/MoH
2	Regulation	LCC/MoH/MoLG	LCC/MoH	LCC/MoE	LCC/MoH	LCC	LCC/EAD	DWSS/LWB/ LCC	DWSS/LWB/ LCC	EAD/MoH
3	Financing	LCC/DPs/MoH/ NGOs	HH - Individuals	S&EIs/MoE/LCC/DPs/ NGOs	LCC/MoH/ DPs	LCC/DPs/MoLG/ LWB	PS/LCC	LWB/DPs	LWB/DPs	LWB/DPs/HHs/HCs/ S&EIs
4	Capacity Development	LCC/DPs/NGOs	CBOs/NGOs	LCC/MoH	LCC/MoH	LCC	LCC/DP/LWB/NGOs	LWB/DPs	LWB/DPs	LWB/NGOs/RIs
5	Planning	LCC/ UA - Wards & Block Leadership	HH & LCC/ UA - Wards & Block Leadership	S&EIs/LCC	HCs/MoH/ LCC	LCC/LWB	LCC/DPs/LWB	LWB	LWB	LWB/HHs
6	Infrastructure Provision	LCC/NGOs	HH - Individuals	S&EIs/LCC	HCs/MoH/ LCC	LCC/NGOs/DPs/ LWB	PS/LCC	LWB/DPs	LWB/DPs	LWB/HHs/HCs/S&EIs
7	Enforcement & Compliance	LCC/ UA - Wards & Block Leadership	LCC/UA - Wards & Block Leadership	LCC/UA - Wards & Block Leadership/MoE	MoH/LCC/UA - Wards and Block Leadership	LCC/UA - Wards & Block Leadership/MoE	LCC	LWB/EAD/ LCC/ Regulator	EAD/LCC/ Regulator	EAD/LCC
8	Asset Management	LCC/NGOs	HH - Individuals	S&EIs	HCs/MoH/ LCC	LCC/PS	PS/LCC	LWB	LWB	LWB/HHs/HCs/S&EIs
9	Service Delivery	LCC/NGOs/CBOs/ PS	PS (F/I)	PS (F/I)	HCs/LCC/ PS (F)	PS	PS (F/I)/LCC	LWB	LWB	LWB/HHs/HCs/S&EIs
10	Monitoring & Evaluation	LCC/ UA - Wards & Block Leadership	LCC/ UA - Wards & Block Leadership, MoH	LCC/MoE/MoH	LCC/MoH	LCC/MoH/MoLG	LCC/EAD	LWB/DWSS	EAD/DWSS/ Regulator	EAD/ DWSS/Regulator

LEGEND

CBOs - Community Based Organizations

DPs - Development Partners

DWSS - Department of Water Supply & Sanitation

EAD - Environment Affairs Department

HCs - Health Centres Facilities

HHs - Households

LCC - Lilongwe City Council

LWB - Lilongwe Water Board

MoE - Ministry of Education

MoH - Ministry of Health

MoLG - Ministry of Local Government

NGO - Non Government Organization

PS (F/I) - Private Sector (Formal /Informal)

RI - Research Institutions

S&EIs - Schools and Educational Institutions

UA - Urban Authorities at Ward and Block Level

Policy and regulation functions shall be coordinated at national level then cascaded down/domesticated at local city-level with specific regulations and by-laws. Whereas Sector coordination and M&E shall be at both National and Opertional level up to wards.

Table 3.2 - City of Lilongwe SWM and Drainage Institutional Framework - Key Stakeholders

Solid Waste Management Chain & Drainage - Institutional Framework - Key Players & Stakeholders										
		Behavioural Change Aspects	Solid Waste Containment				Conveyance		Landfill Management	Reuse
#	Function Attributes	*Public Awareness & Promotion*	*Household Sanitation*	*Schools/Educational Institutions*	*Health care Facilities*	*Public Facilities: Public Places, Markets, Bus & Taxi Terminus, Roads, etc.*	*Solid Waste Collection / Transport*	*Drainage Systems O&M*	*O&M of Landfill, Treatment & Disposal of Leachate*	*Safe beneficial reuse of SW Products and Services.*
1	Policy	LCC/MoLG/EAD	LCC	LCC/MoE	LCC/MoH	LCC/MoLG/EAD	LCC/EAD	EAD/NWRA/LCC/MoT&PW/NRA	LCC/EAD	EAD/MoH
2	Regulation	LCC/EAD/MoLG	LCC/MoH	LCC/MoE	LCC/MoH	LCC	LCC/EAD	LCC/NRA/NWRA	EAD/LCC	EAD/MoH
3	Financing	LCC/DPs/NGOs	HH Individuals	S&EIs/MoE/LCC/ DPs/NGOs	LCC/MoH/ DP	LCC/DPs/MoLG/LWB	PS/LCC	LCC/DPs	LCC/DPs	LCC/DPs/HHs/ HCs/S&EIs
4	Capacity Development	LCC/DPs/NGOs	CBOs/NGOs	LCC/MoE	LCC/MoH	LCC	LCC/DP/NGOs	LCC/DPs	LCC/DPs	LCC/NGOs/RIs
5	Planning	LCC/ UA - Wards & Block Leadership	HH & LCC/ UA - Wards & Block Leadership	S&EIs/LCC	HCs/MoH/LCC	LCC	LCC/DPs	LCC/NWRA/NRA	LCC	LCC/HHs/S&Eis/ HCs
6	Infrastructure Provision	LCC/NGOs	HH - Individuals	S&EIs/LCC	HCs/MoH/LCC	LCC/NGOs/DPs	PS/LCC	LCC/DPs	LCC/DPs	LCC/HHs/HCs/ S&EIs
7	Enforcement & Compliance	LCC/ UA - Wards & Block Leadership	LCC/UA - Wards & Block Leadership	LCC/UA - Wards & Block Leadership/MoE	MoH/LCC/UA - Wards and Block Leadership	LCC/UA - Wards & Block Leadership/MoE	LCC	LCC/EAD/LCC/ Regulator	EAD/LCC/ Regulator	EAD/LCC
8	Asset Management	LCC/NGOs	HH - Individuals	S&EIs	HCs/MoH/LCC	LCC/PS	PS/LCC	LCC/NRA	LCC	LCC/HHs/HCs/ S&EIs
9	Service Delivery	LCC/NGOs/CBOs/PS	PS (F/I)	PS (F/I)	HCs/LCC/ Specialized PS (F)	PS (F/I)	PS (F/I)/LCC	LCC	LCC	LCC/HHs/HCs/ S&EIs
10	Monitoring & Evaluation	LCC/ UA - Wards & Block Leadership	LCC/ UA - Wards & Block Leadership, MoH	LCC/UA-Wards & Block Leadership/MoE	LCC/MoH	LCC/UA-Wards & Block Leadership/MoLG	LCC/UA-Wards & Block Leadership/ EAD	LCC/EAD/NRA/NRWA	EAD/NWRA/ Regulator	LCC/Regulator

LEGEND

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DPs - Development Partners

EAD - Environment Affairs Department

HCs - Health Centres Facilities

HHs - Households

LCC - Lilongwe City Council

MoE - Ministry of Education

MoH - Ministry of Health

MoLG - Ministry of Local Government

MoT&PW - Ministry of Transport & Public Works

NGO - Non Government Organization

NRA - National Roads Authority

NWRA - National Water Resources Authority

PS (F/I) - Private Sector (Formal /Informal)

RI - Research Institutions

S&EIs - Schools and Educational Institutions

3.3 OPERATIONAL LEVEL

3.3.1 INSTITUTIONAL ASPECTS – DRAINAGE AND SANITATION

Reference is made to sub-section 2.4 – Enabling Environment Pillar – interventions and measures that are precursor to motivate institutional and sector reforms. In additional the following institutional aspects, at an operational level, Table 3.3 are proposed but not limited to:

Table 3.3 - Institutional Arrangement – Operational Level Key Strategic Actions & Result Areas

Key Strategic Actions	Target/Result Areas	Activities	Level of Service Target
Strengthening and maintaining an institution with the best possible workforce in terms of safety, productivity, customer service, training and financial resources to handle drainage and sanitation needs in Lilongwe City.	LCC and Roads Authority with a working agreement for LCC to manage all City drainage requirements, including roads drainage infrastructure across the City by end-2022.	Engage and hold discussions with the output of a **Memorandum of Agreement (MoA)** rolling over all City Roads drainage requirements to LCC with technical and financial assistance from Roads Authority and Roads Funds Administration, respectively.	All City drainage managed by LCC by end-2022
	LCC with re-structured departments, well-resourced and with re-assigned roles for effective delivery of drainage and sanitation services by end-2022.	Review LCC departmental roles and undertake restructuring and re-assignment of roles for effective delivery of drainage and sanitation services.	All LCC departments with clear roles on drainage and sanitation by end-2022
		Provide the necessary and relevant training to departmental staff on drainage and sewer maintenance and network improvements.	LCC with trained staff in drainage and sewer infrastructure design and maintenance
	LCC with optimized management of workforce, equipment, and workplace to create an environment that ensures effective delivery of drainage and sanitation services by end-2022.	Undertake recruitment and staff roles re-assignment for effective delivery of services and ensure staff retention through completive remuneration and training.	Staff turn-over reduced and maintained to less than 10% in the medium term.
		Optimize equipment management with reduced equipment down time and adopt new technology to support effective and efficient operations.	Equipment and fleet down time reduced to 7 days
	LCC with a fair and equitable tariff structure and with sustainable financial streams that supports the necessary drainage and sanitation services initiatives by end-2022.	Engage and seek for Municipal Services Tariff Setting Regulations to be prepared and effected.	Drainage and sanitation tariff setting regulated by end-2022.
		Set and apply tariff to un-tariffed services such as sewerage, drainage and solid waste management.	Sewerage, drainage and solid waste management tariff implemented by end-2022.
Ensuring Institutional Fiscal Responsibility that entails an institution operating in a manner that is financially sustainable.	Drainage and sanitation services with a well-planned, balanced, and managed budget that clearly demonstrates to customers the value they receive for the rates they pay by end-2022.	Ensure a fair and equitable tariff structure that supports the necessary drainage and sanitation services initiatives.	A fair and equitable tariff structure implemented by end-2022.
		Engage in transparent and efficient budgeting and reporting processes to provide clear and timely financial information.	Budgets and expenditure return ready within a month after the end of the fiscal year.
Ensure Lilongwe City that is governed by a comprehensive set of legislation, policy, regulations, standards and set operational procedures.	Lilongwe City stakeholder institutions with the capacity and able to enforce legislation, policy, regulations, standards and set operational procedures by end-2022	Set-up a well resouced Enforcement and Compliance Unit within LCC with direct reporting line to the Chief Executive.	Enforcement and Compliance Unit within LCC set-up and operational and with a budget by end-2022.
		LCC with a working arrangement with the Police, Environmental Affairs Department, Malawi Environment Protection Authority (MEPA) and National Water Resources Authority (NWRA).	LCC with a working arrangement with other stakeholder institutions on Sanitation,Drainage and Water Resources by end-2022.

Key Strategic Actions	Target/Result Areas	Activities	Level of Service Target
		Review and initiate for the preparation of missing legislation, policy, regulations, standards and operational procedures.	Governance instruments reviewed and in use, with the prepation of missing ones initiated by end-2022.
		Undertake environmental protection through enforcement of laws on waste disposal and illegal dumping of liquid and solid waste.	Zero solid and liquid waste dumping in drainage infrastructure and in and along natural water courses by end-2022.
		Undertake enforcement and monitoring of land use and the associated plans to ensure compliance.	Zero emergence of new uncontrolled and unplanned "squatter" areas by end-2022 and onwards.

3.3.2 TECHNICAL ASSISTANCE AND CAPACITY BUILDING

In order to improve performance at an operational level – particularly on technical and business side and commercialization of services delivery, the two key service providers i.e. LCC and LWB must in the interim (Short Term) be supported, hand-held, and mentored. The following propositions in the organization structure are proposed:

A. LCC

- Reorganize and create a Business Stream under the LCC CEO headed by a Deputy DCEO – Business Services in Charge of Finance, Commercial, Human Resource and Administration. For the next 3 years this position will be filled by a Technical Advisor to design, develop and roll out business stream systems, process, procedures, targets and performance indicators, and capacity build and training subordinates.
- The DEO- Business Services to be deputized by a Director Commercial –recruited from open market charged with commercialization of the LCC service delivery in order for the LCC be financially viable.
- Reorganize and create a Technical Stream – headed by Deputy CEO – Technical Services in charge of Engineering, EM Maintenance, FSM, SWM, Environment, Planning, MIS, etc. The position for the next 3 years shall be filled by a Technical Advisor with clear Key Result Areas among which is to set up systems and processes to improve LCC performance.
- The DCEO – Technical Services to be deputized by Director Engineering as a counterpart. This position shall also be filled from open market.
- Under the office of the CEO create an Enforcement and Compliance function – headed by Division Head aslo head-hunted from the Security or Judiciary Services.

B. LWB

- As for the LCC create a Business Services Stream to be headed by DCEO – Business Services.
- - ditto- for Technical Services – procure a CEO Technical Services to be deputized by Director Engineering.
- Create a position and appoint a deputy Director/senior manager in charge of Sewerage Services – a new function in LWB.
- Under the Business Stream create a position of Director Commercial and Customer-Care to commercialization service delivery in order to improve LWB financial viability.

4 FINANCING THE STRATEGY

4.1 INPUT COSTS

The total financial requirement for implementation of the Strategy is USD 306,095,030 The amount is for immediate, short, medium and long-term needs for the period F/Y 2022/23 to F/Y 2036/27 (total of 15 years). At the time of preparation of the strategy, the medium to long-term funding commitments for sanitation and drainage services in Lilongwe City could not be readily established. The key actors – chiefly the Government of Malawi, LWB, LCC and the relevant Ministries – will put together a detailed plan to mobilise resources to finance and implement this Strategy.

4.2 FINANCING STREAMS

4.2.1 FINANCING FOR CAPITAL INFRASTRUCTURE INVESTMENTS AND O&M

The utility providers must define and identify the requisite financial sources to meet the Capital Expenditures (CAPEX) and Operational Expenditures (OPEX) for planned activities. The sanitation investment plan alone demands a huge amount of financial resources that LCC/LWB (and Malawi) is not able to generate. External resources are required from multilateral and bilateral donors to finance the plan. Nonetheless, external funding has been gradually changing from grants to loans, even for water and sanitation investments. During sector and Institutional reforms, a decision has to be taken on service models regarding tariff setting criteria. The available and recommended funding sources are identified, leaving a huge burden on how to finance these investments and operations to the LWB and LCC.

The above notwithstanding, a funds mobilisation plan could tap into a host of streams. The main sources of finance for sanitation and drainage services are:

- public budget: domestic transfers via the annual Government of Malawi's budget;
- development partners: on and off-budget contributions, grants and loans;
- private financing: household contributions to sanitation hardware, user charges;
- international and local NGOs: financial and in-kind contributions;
- financial institutions: tailor-made sanitation products (loans).

It is expected that O&M will primarily be covered by tariffs, licenses and fees charged by service providers, while capital investments and major repairs/rehabilations shall be covered by government subvention, grants, loans and development partners project support.

Support for demand-enhancement promotional activities are expected to be financed through public funds. The same applies to output-based subsidies for both low-income households and sanitation entrepreneurs. Capacity building for the latter will be realised through strategic partneships with NGOs that are already active in Lilongwe's nascent sanitation market.

SANITATION

The proposed activities for sanitation improvements are to be financed by tariffs and fees charged directly to the users as they already have a water connection. However, full cost recovery must be taken in account when setting tariffs and fees. Regarding Faecal Sludge Management, funds will be raised from discharge fees at the FSTPs. This will be in form of gate-fee per volume – whenever LCC and private operators discharge at the FSTP. Full cost recovery should also be pursued without cross-subsidisation between activities.

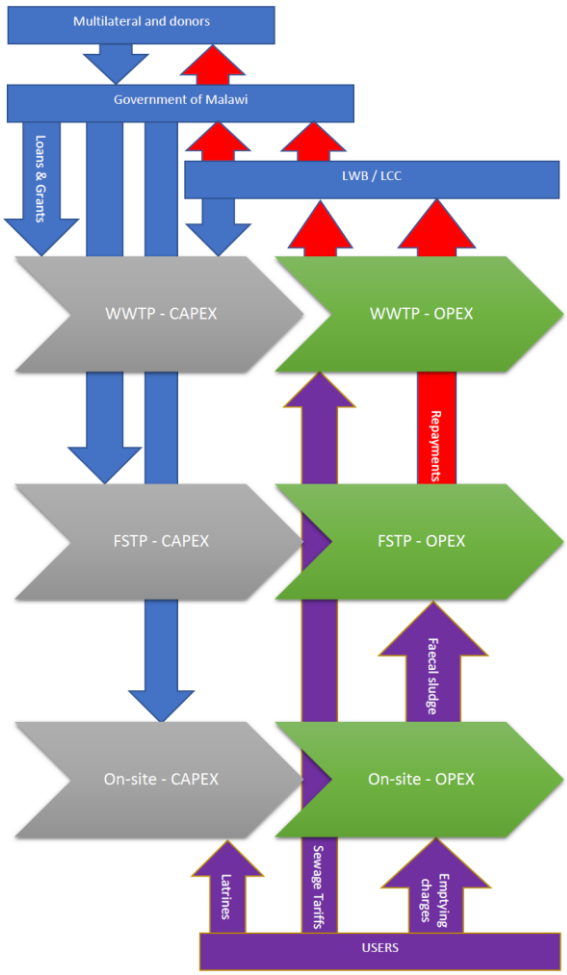

Figure 4.1- Funding for sanitation

The financial terms and conditions for the transfer of the sewerage network and WWTP from LCC to LWB are not yet defined, but for the financial analysis an evaluation of existent assets (sewerage system and WWTP) was considered. It was also considered in the present analysis the CAPEX from network expansion and WWTP upgrades.

Three different Projects were considered for analysis: 1) off-site sewerage system; 2) Faecal sludge treatment system; and 3) Faecal sludge transport system.

The option for doing this separate evaluation allow to allocate these different services to different entities (LWB or LCC) and understand what are the tariff needed to support each project without cross-subsidising.

For the off-site sanitation full recovery of CAPEX and OPEX, a sensitivity analysis was also done for the sustainable tariff for the different IRR that are presented in Table 4.1.

Table 4.1 - Charge on water consumption for sewerage system (drainage+treatment) with different Internal Rate of Return (IRR)

IRR	0%	2%	4%	6%
Full cost recovery charge on Water consumption(USD/m³)	0,52	0,61	0,70	0,78
Operational Cost Recovery charge on Water consumption (USD/m³)	0,10	0,10	0,10	0,10

For the off-site sanitation full recovery, it is required a tariff on wastewater collected, from 0.52 USD/m³, considering an internal rate of return (IRR) of 0%, to 0,78 USD/m³ considering an internal rate of return (IRR) of 6%. The following table shows full cost recovery with different Internal Return rate (IRR) scenarios. This full cost recovery for a sewarage system is a value similar to the one paid by a family for water supply that have a water consumption of 15 m³/month (0,61 USD/m³).

Direct revenue generation through the water bill is the most suitable funding source to finance this activity. LWB has the information and the tools to bill and collect the off-site sanitation charges through the water bill, as it only needs to the complement the customer database with the information regarding the sewerage connection.

A similar analysis was done for Faecal sludge treatment and for faecal sludge collection.

Table 4.2 - Cost recovery charge for faecal sludge treatment with different Internal Rate of Return (IRR)

IRR	0%	2%	4%	6%
Full Cost recovery charge:				
Charge on Water consumption (USD/m³)	0,11	0,12	0,14	0,15
Charge on sludge disposed (USD/m³)	6,43	7,51	8,56	9,49
Operational Cost recovery charge:				
Charge on Water consumption (USD/m³)	0,02	0,02	0,02	0,02
Charge on sludge disposed (USD/m³)	0,93	0,93	0,93	0,93

For the faecal sludge, a full recovery of faecal sludge treatment is from 6.43 USD per m³ of faecal sludge received in the FSTP's (or 0,11 USD per m³ of water consumption if charge is applied on the water bill), considering an 0% internal rate of return (IRR) to 9.49 USD per m³ of faecal sludge received in the FSTP's, (or 0,15 USD per m³ of water consumption if charge is applied on the water bill).

Again, a direct revenue generation through the water bill is a suitable funding source to finance this activity. LWB has the information and the tools to bill and collect the faecal sludge treatment charges for faecal sludge through the water bill, as it only needs to complement the customer database with the information regarding the sewerage connection. The full cost recovery for treatment coming through the water bill allow that LCC or private operators may deliver the sludge in treatment plants without the need of any payment by the delivery entities to LWB. With this strategy of delivering sludge in the treatment plants free of charge it will be an incentive to deliver the sludge in the right place. Another alternative, is the treatment cost recovery will be raised from discharge fees at the FSTPs, in form of gate-fee per volume whenever LCC and private operators discharge at the FSTP.

Table 4.3 - Cost recovery Charges for faecal sludge transport with different Internal Rate of Return (IRR)

IRR	0%	2%	4%	6%
Full Cost recovery charge:				
Charge on Water consumption (USD/m³)	0,19	0,20	0,21	0,22
Charge on sludge disposed (USD/m³)	11,75	12,29	12,84	13,39
Operational Cost recovery charge:				
Charge on Water consumption (USD/m³)	0,10	0,10	0,10	0,10
Charge on sludge disposed (USD/m³)	5,99	5,99	5,99	5,99

To fully recover on-site sanitation OPEX and CAPEX for the transport activity, LCC or private operators must charge 11.75 USD per m^3 of faecal sludge removed from the users' sanitary facilities (or 0,19 USD per m^3 of water consumption if charge is applied on the water bill), considering an 0% internal rate of return (IRR) to 13,39 USD per m^3 of faecal sludge received in the FSTP's, (or 0,22 USD per m^3 of water consumption if charge is applied on the water bill) considering an 6% internal rate of return (IRR).

For a household connection with the minimum consumption of 5 m3/month the average cost are 0,47 USD/m^3 the full cost recovery for faecal sludge system for all chain service (transport + treatment) will be from 0,30 USD/m^3 considering IRR of 0% to 0,37 USD/m^3 considering 6% of IRR (about 65% of the water tariff).

This task may be done by LCC or by private operators by customers demand. The revenue generation may be done through customers direct payment to the entity that deliver the service (LCC or private operator).

SOLID WASTE

Waste management requires substantial financial resources as both capital expenditure and operational costs are high. Although directly charging the users is used in many cities worldwide, LCC has not been effective with regard to billing and collecting for waste management services from the users . The Pay-as-You-Throw schemes are very difficult to successfully implement. Hence, LCC has only been able to generate revenues to cover a marginal part of the OPEX.

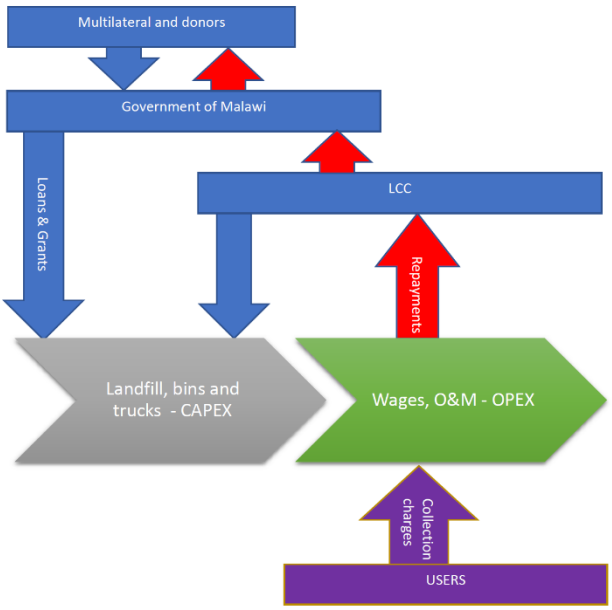

Figure 4.2 - Funding for solid waste

Nonetheless, there are several alternative options to generate revenues to finance waste management activities – from allocating public budgetary funds to charging through proxies, such as water, electricity or Property Taxes. Although embedding waste management fees in the water bill would be a viable alternative, the LWB's client base does not include the entire population served by waste management services. For this purpose, electricity would be a better option, as electricity consumption is generally correlated to the waste production.

Another attractive option to raise revenues to cover CAPEX and OPEX is to introduce a threshold on the waste management services provided by the LCC: for instance, defining that major waste producers, such as industries, institutions, and commercial facilities must safely manage their waste production – from collection to disposal of their waste at the designated landfill sites. This measure would reduce LCC's CAPEX and OPEX, as fewer "skip" containers, "skip" loading trucks and ampliroll trucks would be required. However, this option reduces the opportunity of cross-subsidisation between the major waste producers and the most disadvantaged population.

The solid waste management full recovery requires an income from 27.13 USD/ton considering an internal rate of return (IRR) of 0% to 30.62 USD/ton, considering an internal rate of return (IRR) of 6%. The following table shows full cost recovery with different Internal Return rate (IRR) scenarios.

Table 4.4 - Full cost recovery charge for waste management with different Internal Rate of Return (IRR)

IRR	0%	2%	4%	6%
Full Cost recovery:				
USD/ton	27,13	28,26	29,41	30,62
USD/per HH/year	25,52	26,47	27,43	28,43
Operational Cost recovery:				

IRR	0%	2%	4%	6%
USD/ton	20,75	20,88	21,00	21,13
USD/per HH/year	19,52	19,55	19,59	19,61

The Solid Waste service be provided to the users should be responsibility of LCC, but this can be done directly with in-house resources, or creating market conditions to be provided by private operators (partially or totally). Different approaches can be implemented for the chain process:

- Landfill and solid waste tretament could be managed directly by LCC or by Public-Private Partnership concession;
- Solid waste collection could be managed by private operators by concession areas given by LCC; or open to a free market of operators that make contracts to individual users and LCC only gave licenses and making the market regulation and receiving fees (from the users or from the private operators) to pay those campaigns and the treatment (if the treatment stays in LCC).

DRAINAGE

LCC to explore and identify streams of financial sources to fund the Capital Expenditures (CAPEX) and the Operational Expenditures (OPEX). If they are to be funded from the City Rates (locally generated revenue) or from tariffs and fees revenues charged directly to the users, or a mix of both, the rates should show the portion that is collected for drainage services and ring fence it for the intended purpose and account for it. In the case of General Resources Funds, LCC should establish the amount that will be available to each of the activities and also the amount to be available to fund CAPEX and OPEX per activity which should include drainage services. Likewise, the Roads Authority should provide and ring fence such budget provisions for drainage requirements due to road network under their jurisdiction.

For the drainage/ river flooding prevention punctual interventions and cleaning full recovery of CAPEX and OPEX was also done a sensitivity analysis for the sustainable income for different IRR that are presented in next table.

Table 4.5 - Cost recovery charges for drainage with different Internal Rate of Return (IRR)

IRR	0%	2%	4%	6%
Full Cost recovery:				
Urban Dranaige (USD/per HH/year)	5,59	5,73	5,88	6,02
Flooding River Prevention (USD/per HH/year)	8,70	8,93	9,12	9,26
Operational Cost recovery:				
Urban Dranaige (USD/per HH/year)	0,79	0,80	0,80	0,80
Flooding River Prevention (USD/per HH/year)	0,35	0,34	0,34	0,33

It is expected that LCC fund the drainage and stormwater activities from City Rates, the General Resources Funds or property taxes, since drainage services are unlikely to provide self-generated revenue.

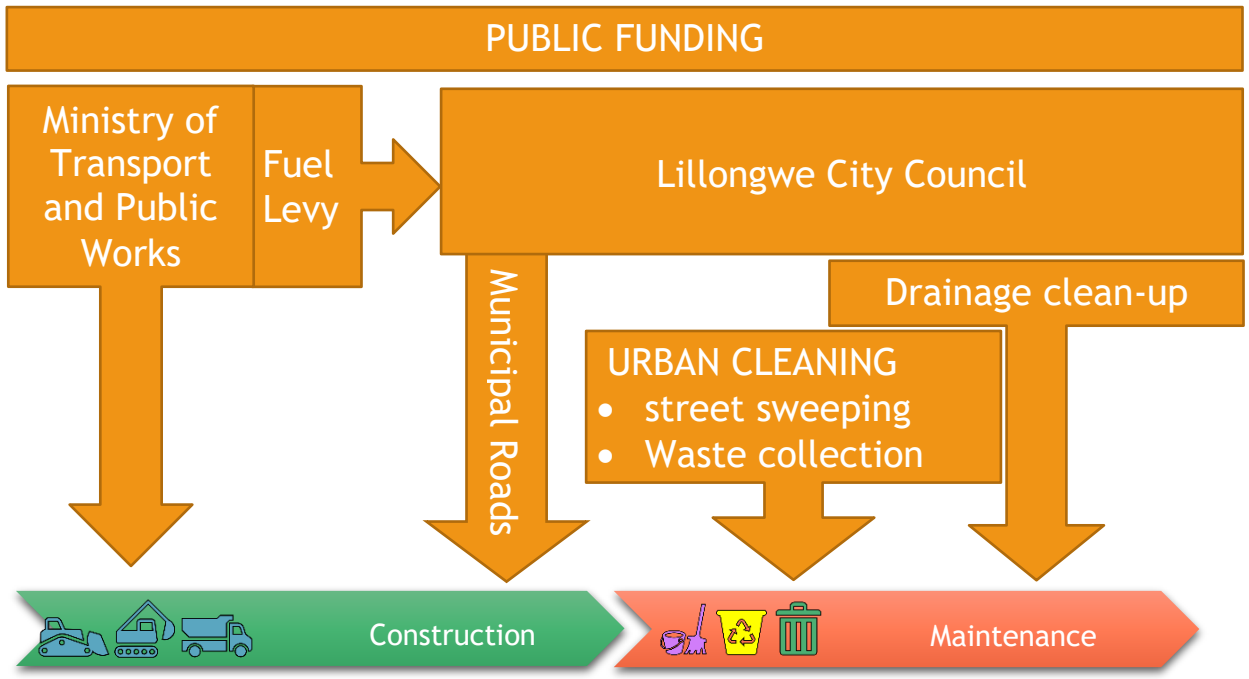

Figure 4.3 - Funding streams for drainage

Given the results of the sensitivity analysis of the cash flow of the drainage and sanitation system, it is possible to conclude that this investment project will be sustainable through acceptable tariffs, if the project has access to long-term loans with low interest rates to finance the project.

4.2.2 EFFORTS TOWARDS FINANCIAL SUSTAINABILITY

Whereas Lilongwe's sanitation market is largely weak, undeveloped and unmanaged, there are efforts to improve the same. For instance, WSUP Advisory is developing a business plan for faecal sludge management within the city. This plan will guide gradual progression from an unmanaged and unregulated sanitation sector in Lilongwe to one that is managed for the benefit of the health and wellbeing of residents, the environment and of institutions and businesses serving the market6. The are also efforts to introduce a sewerage tariff to meet some of the operation and maintenance costs of the city's sewerage system. The activities in this Strategy related to sewerage operations could be financed via the tariff.

Support for demand-enhancement promotional activities will be through public funds. The same applies to output-based subsidies for both low-income households and sanitation enterepreneurs. Capacity

[6]LWSP 2021b. Development of Sanitation Business Plan for Lilongwe City, Draft Business Plan - Authoured by WSUP Advisory.

building for the latter will be realised through strategic partneships with NGOs that are already active in Lilongwe's nascent sanitation market.

The bulk of the financial needs relate to capital investments for sanitation and drainage infrastructure. Part of resource mobilisation will entail preparation of bankable projects to tap into the development finance from multilateral and bilateral institutions. The strategy falls within the last decade of the Sustainable Development Goals (SDGs) agenda, and there are global efforts to fast-track attainment of safely managed services for all by 2030. This is an opportunity to mobilise funds to execute this Strategy.

The introduction of tariff should be applied to all services that entail a cost to the institutions managing the services.

4.3 HUMAN CAPITAL

4.3.1 ORGANISATIONAL STRUCTURE

LCC's change management plan must enforce accountability on the organisation and its key players. Moving towards accountailibity requires the overhaul of LCC's Organisation Chart, defining the mission, the vision, the goals and the allocation of human, technical and financial resources for each department. The definition of hierarchical responsibilities and the chain of command, while ensuring the segregation of duties and functions, are crucial to enforce accountability.

The Departments should be responsible for the preparation and submission to approval of the Annual Budget and Investment Plan by the City Council, and the Department Heads should have autonomy to execute their activities within the approved Annual Budget settings.

The organisational chart should favour the vertical integration of the activities witihin the same department and chain of command and responsibilities. Overlaping and transversal activities should be regarded as internal service providers and service level agreements should be observed between parties.

The sewerage network, WWTPs and FSTPs infrastructures and operation are to be transferred to Lilongwe Water Board (LWB). For this matter it is recommended that LWB should create a specific Business Unit to manage and operate these activities.

The new business unit's tasks and duties include the operation and management of the sewerage collection network, the transport of the collected wastewater to the WWTPs, the treatment of the wastewater and finally the disposal of the treated wastewater back on the environment. It will also be responsible for the expansion of the sewerage network and new connections. Regardinhg the Faecal Sludge, LWB will operate and manage the FSTP's and receive the Faecal Sludge collected by LCC and other private operators.

ON-SITE SANITATION

On-site sanitation activities should remain in the Health Department organisational chart. However, on-site sanitation should be detached as an autonomous Business Unit under the direct supervision of the Assistant Director of Health/Cleansing. Its mission is to operate and manage the collection of faecal

sludge and the transfer of the sludge to the Faecal Sludge Transfer Stations (FSTS) and finally to the Faecal Sludge Treatment Plants (FSTP) operated by LWB.

The on-site sanitation business unit's tasks and duties include the establishment of programmed/scheduled faecal sludge collection routines, on-call collection services and the transfer of the sludge to the FSTSs and FSTPs. Its tasks and duties also include the fleet management of the septic tank trucks and the smaller vacutugs. Although daily maintenance of the fleet, such as fuel and topping lubricant, coolant and hydraulic fluids, should be performed by the on-site sanitation business unit. Repair and scheduled maintenance of the fleet should be left with the Transport Department witinh LCC or with external workshops. Another important task is the licensing, supervision and register of the new and the existing sanitation facilities, as well as setting the rules of construction and use of those facilities.

As the faecal sludge collection and transfer is operated on a daily basis, it is recommended that the drivers an auxiliary personnel are permanentely allocated to the business unit.

DRAINAGE AND STORMWATER

The regular maintenance of the drainage network is achieve by regular urban cleaning - street sweeping and effective waste collection.As preparation for incoming raining season it is strongly recommended to carry out clean-up campaigns on the drainage network to ensure full flow capacity. For Lilongwe, two annual one-month clean-up campaigns are required, hence it is not necessary to have an autonomous business unit for this activity.

The human and technical resources (skip containers and trucks to transfer the colleted waste and debris to the landfill) required to carry-out the clean-up campaigns should be provided by LCC, as this is an intermittent activity.

WASTE MANAGEMENT

The waste management should also be detached as an autonomous business unit within the Health Department under the supervision of the Assistant Director of Health/Cleansing. Its mission is to collect the solid wasted generated within the city limits and dispose it in the landfill.

The waste management tasks and duties include the establishment of colletion routes and the strategical placement of the waste transfer stations (WTS) and the collection bins, the managemet and operation of the WTSs and the landfill. It also includes the upgrade of the existing dumpsite to meet landfill standarts and further cell expansions. The introduction of selective collection of recyclable materials is another important task to be implemented by the waste management business unit.

The management of the extensive fleet of skip carriers, compactors, ampliroll trucks, landfill excavator, shoveloader, backhoe loader, dumper and compactors is also a task and a dutie of the waste management business unit. Accordingly to what is envisaged for the on-site business unit, the daily maintenance of the fleet, such as fuel and topping lubricant, coolant and hydraulic fluids, should be performed by the

waste management business unit, but the repair and scheduled maintenance of the fleet should be left with the Transport Department witinh LCC or with external workshops.

4.3.2 HUMAN RESOURCES

A key component of the change management program is the organization chart. Establishing the hierarchic levels of command, duties and responsibilities, detailing the job descriprtions to each role and ensuring a proper segregation of duties and responsibles are key attributes of the organization chart.

WASTEWATER TREATMENT PLANT (WWTP) AND FAECAL SLUDGE TREATMENT PLANT (FSTP)

The integration of the off-site sanitation and the faecal sludge treatment operations in LWB's organisational chart it is challenging as one must take in consideration the differences on background organizational cultures between LCC and LWB. A capacity building, tranining and LWB's culture assimilation program must be developed to incorporate transferred personnel from LLC, and the new busines unit must have the same rank as other business units inside LWB's orgnisation chart.

It is assumed that the new business unit will have full support from LWBs existing shared internal services, such as administration, accounting, treasury, legal, human resources, maintenance, IT, logistics, procurement, etc.

The analytical control and laboratory should be detached from the WWTPs and FSTP as it should be regarded as an internal service provider to support the operation of both WWTPs and FSTPs.

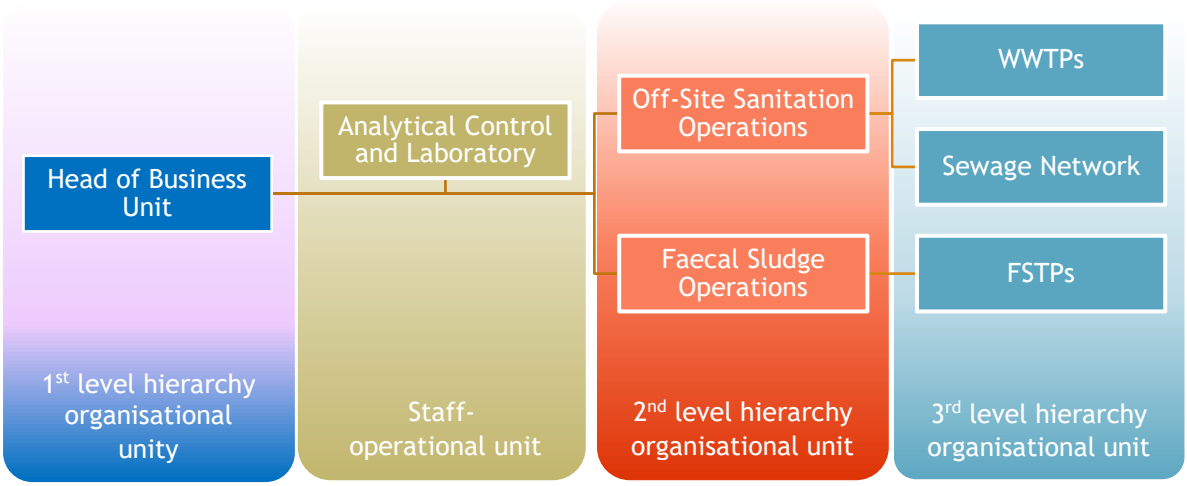

Figure 4.4 - Off-site sanitation, Wastewater Treatment Plant (WWT and Faecal Sludge Treatment Plant (FSTP) organisational chart

The head of the first level herarchy organizational unit's job description is:

- Lead and submit to the board of director's approval the business unit's annual activities plan, including the annual budget and Investment plan;
- Define key performance indicators (KPI) to gauge the business unit's performance;

- Lead and monitor the business unit's operation, performance and budget compliance, implementing any corrective measure to ensure that budget and KPI targets are met;
- Ensure the adequate and efficient use of the available technical and human resources;
- Supervise and monitor the operation and performance of the subordinated organisational units, ensuring fully articulation between them;
- Provide support and continuos knowledge about the management and operation of the business unit;
- Manage and coordinate the business unit's staff and personnel, ensuring that health and safety standarts are met;
- Provide timely and accurate report of operational, financial, accounting and invoicing information, ensuring that the information is loaded in the designated IT tools and available to the intended recipients.
- Provide timely response to external and internal demands, ensuring the information's accuracy and reliability.
- Ensure full compliance of all statutory provisions and internal company regulationsas as well as all aplicable standards and legislation.

The second level hierarchy organizational unit's head has the following job description:

- Coordinate the preparation of the annual activities Plan, including the annual budget and Investment plan for the unit;
- Review and monitor KPIs and budget compliance to gauge the unit's performance, implementing any corrective measure to ensure that budget and KPI targets are met;
- Coordinate and monitor the organizational unit's (including the subordinated units) operation, performance and budget compliance;
- Follow-up the daily activity of subordinated oraganisational units, prodiving support and knowledge about the operation and maintenance of the organizational unit.
- Identify available operational improvement opportunities, benchmarking the organizational unit's performance with other comparable operations;
- Manage the unit's technical, material and human resources, ensuring its adequate and efficient use;

The third level hierarchy organizational unit's head has the following job description:

- Prepare the annual activities Plan, including the annual budget and Investment plan for the unit;
- Review and monitor KPIs and budget compliance to gauge the unit's performance, implementing any corrective measure to ensure that budget and KPI targets are met;

- Manage the unit's technical, material and human resources, ensuring its adequate and efficient use, assigning and supervising the daily routines to subordinanted personel;
- Support the hierarchical superior unit's head on identifying and implementing measures to optimize performance, reducing costs and improving the reliability of the facilities and equipments;
- Ensure the coherence, adequacy and optimization of the maintenance plan for the facilities and equipments;
- Coordinate and control the unit's operation, performance and budget compliance;
- Provide timely and accurate report of operational, financial, accounting and invoicing information, ensuring that the information is loaded in the designated IT tools and available to the intended recipients.

The job description of the head of a "staff - operational unit" is:

- Prepare the annual activities Plan, including the annual budget and Investment plan for the operational unit or staff support;
- Review and monitor KPIs and budget compliance to gauge the unit's performance, implementing any corrective measure to ensure that budget and KPI targets are met;
- Coordinate and control the unit's operation, performance and budget compliance, ensuring that activities are executed accordingly to the defined budget, schedule and quality standard;
- Manage the unit's technical, material and human resources, ensuring its adequate and efficient use;
- Direct subordinated personnel, defining priorities, organizing teams, assigning tasks and duties;
- Provide timely and accurate report of operational, financial, accounting and invoicing information, ensuring that the information is loaded in the designated IT tools and available to the intended recipients.

ON-SITE SANITATION

As previously mentioned, on-site sanitation should be detached as an autonomous unit within LCC's Health Department under the direct supervision of the Assistant Director of Health/Cleansing. Similary to what is foreseen to LWB, it I expected that the on-site sanitation business unit should have support and access to LCC's shared internal services such as administration, accounting, treasury, legal, human resources, maintenance, IT, logistics, procurement, etc.

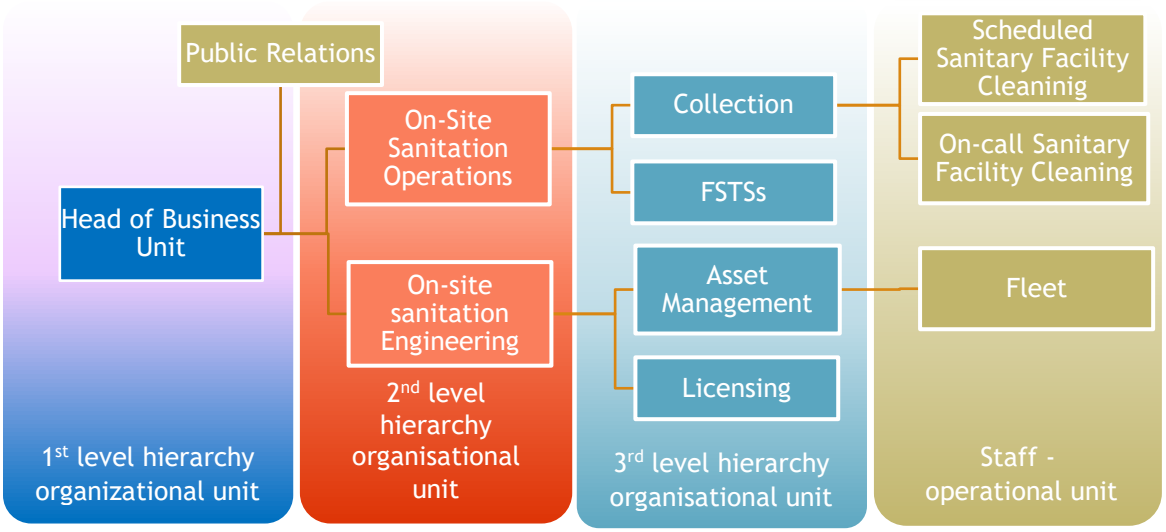

Figure 4.5 – On-site sanitation organisational chart

The job descriptions per hierchical leval are the same as described for the off-site sanitation to be established in LWB.

The on-site sanitation operations mission is to establish and run a scheduled programme to clean user's sanitary facilities, accordingly to their location, type and volume, and deposing the collected faecal sludge on the FSTSs, ensuring the most efficient use of technical, material and human resources. Besides the programme for emptying the sanitary facilities as per a pre-established schedule, It is also responsible for collecting faecal sludge as per on-call emptying services. It is expected that on-call services will be declining as a full scheduled programme will be in place. Private operators are also available to perform these on-call services. The management of the FSTSs is also under the supervision of on-site operations, ensuring that FSTSs' capacity load and transfer capacity to the FSTP are efficiently used. The drivers and auxiliary personnel should be fully allocated to the operational units as well as the septic tank trucks and the smaller vacutugs fleet should be execlusively allocated to the operational units.

The on-site sanitation engineering mission is to support the faecal sludge collection activities, developing and keeping up-to-date a Geographical Information System (GIS), containing detailed information of the sanitary facilities – ownership, location, type, volume and the date of last emptying. The issue of technical specifications, regulatory norms and licensing new sanitary facilities is also a competence assigned to the on-site sanitation engineering. Under asset management is the facilities management, including fleet management, as the septic tank trucks and the vacutrucks are for the exclusive use of on-site sanitation, the fleet should be directly managed by on-site sanitation business unit.

The public relations mission is to raise the levels of public engagement regarding the hygiene and sanitation behaviour, raising awareness to the environmental issues and the health and social benefits of sound sanitation habits.

DRAINAGE AND STORMWATER

Drainage and stormwater should remain as it is, as most of the drainage maintenance is performed by urban cleansing while street sweeping. However a special designated team should be assigned to coordinate and supervise the two annual drainage network cleaning and unclogging campaigns. A detached organizational should be established under the urban cleansing department to coordinate the preparation and execution of the two annual campaigns, using the urban cleansing available personnel and the waste management resources – skip containers and trucks to collect debris and disposal on the landfill.

WASTE MANAGEMENT

Similarly as advocated to the on-site sanitation, the waste management should also be detached as an autonomous business unit within the Health Department under the supervision of the Assistant Director of Health/Cleansing. It is also expected that waste management business unit should have support and access to LCC's shared internal services such as administration, accounting, treasury, legal, human resources, maintenance, IT, logistics, procurement, etc.

As previously mentioned, on-site sanitation should be detached as an autonomous unit within LCC's Health Department under the direct supervision of the Assistant Director of Health/Cleansing. Similary to What is foreseen to LWB, it I expected that the on-site sanitation business unit should have support and access to LCC's shared internal services such as administration, accounting, treasury, legal, human resources, maintenance, IT, logistics, procurement, etc.

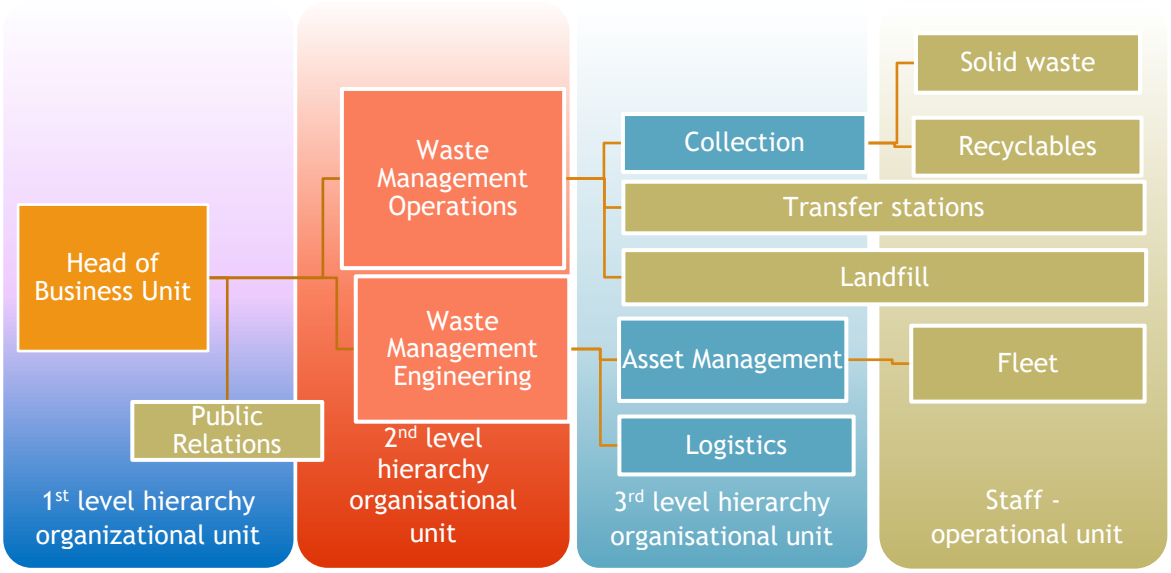

Figure 4.6 – Waste management organisational chart

The job descriptions per hierchical leval are the same as described for the off-site sanitation to be established in LWB.

The waste management operation's mission is:

- to ensure collection routes are timely and efficiently completed;
- to manage the waste transfer stations and subsequent waste transfer to the landfill;
- to ensure the efficient use of the available landfill capacity; and,
- to promote and implement a selective collection of urban waste system with segregated collection bins and collection routes.

The waste management engineering organizational unit is responsible for the asset management, logistic and fleet management, its mission is:

- to support the waste collection operation activity, establishing and reviewing the collection routes, defining collection bin placement and collection periodicity (both waste and recyclables);
- to design and implement a Geographical Information System for the waste collection activity, including the waste transfer stations and collection bins' location, as well as the collection routes;
- to manage the extensive fleet of skip carriers, compactor and ampliroll trucks used on collection and transfer operations, just as the landfill heavy rolling and compactor equipment; and, - to manage the extensive fleet of collection and transfer containers and bins (30 m3, 6 m3, 1100 litre and triflux).

The public relations mission is to raise the levels of public engagement regarding the waste management, raising awareness to the environmental issues and the health and social benefits of a cleaner Lilongwe.

5 COORDINATION AND MONITORING FRAMEWORK

The situational analysis established that there are various organizations contributing to WASH service delivery in Malawi. Nonetheless, many work in isolation of each other. For sanitation in particular, there is little sector coordination and awareness on who is doing what, where and how to achieve a common goal for improvements. The systemic and multi-tiered nature of WASH services requires to connect the pieces in order to realise concrete improvements.

5.1 SECTOR COORDINATION AND PLANNING

Sector coordination between and within the Government of Malawi, development partners, and civil society is inadequate. Working in silos has led to duplication of work, increase in inequity, and infectiveness. LCC and LWB are not actively involved in the sector coordination activities, and the country has largely not made progress with regard to implementation of the Water Sector Wide Approach (WaSWAp).

In order to improve coordination and implementation of the activities proposed in the Strategy, **a Task Force should be created**. The Task Force should have clearly-defined Terms of Reference, and representation from the various stakeholders involved in delivery of sanitation and drainage services in Lilongwe. Besides LCC and LWB, there should be representation from the relevant MDAs: MoFNR, MoLG, MoH, MoGCDSW, MoEST, NRA, among others. Development partners, civil society and the private sector should be on board as well. The entities should be represented by high-level decision-makers. The Taskforce should meet at least twice or thrice a year to review the progress of the strategy's implementation plan. The Task Force should lead efforts to plan, set priorities, coordinate and monitor the proposed actions to realise the objectives of the Strategy.

5.2 MONITORING, EVALUATION AND COMMUNICATION

Malawi's WASH sector lacks a functional monitoring and evaluation (M&E) framework. The strategy proposes creation of two levels of M&E – at national level and Lilongwe City-level to:

- Monitor and evaluate the achievement of the service targets defined by the goals of the strategy: i) increase access to safely managed sanitation services in Lilongwe City; ii) effective and efficient solid waste management services; and iii) improve drainage systems, protect buffer zones/catchments in order to control flooding in Lilongwe City.
- Monitor and evaluate the effectiveness of the actions and activities in the strategy. This should be guided by the indicators and targets defined in Section 2 for the three sub-sectors: sanitation and hygiene, solid waste management, and drainage.

In addition to the Task Force proposed in the previous sections, a joint monitoring framework should be established. The purpose of the framework is to among others:

- Document the sanitation and/or drainage activities that the respective actors are undertaking in Lilongwe.

- Assess the contribution that various actors are making in line with attainment of the objectives of this strategy.
- Guide decision-making by making routine data available in a timely manner.
- Collate and share lessons from the actor's respective activities.

The monitoring framework should be updated regularly and easily accessible – to track progress towards achieving universal access to safely managed sanitation services in Lilongwe City by 2030.

Public support for the Strategy will be secured through multi-dimensional, tailored-messages for the various audiences, including the general public. To this effect, a Communication Plan should be developed as part of the awareness and promotional measures. The communication plan will help to rally citizen support that initiatives proposed in the Strategy for Sanitation and Drainage Improvement are not for government purposes alone, but the measures are useful to all stakeholders. The communication plan will also aid to garner political support for the Strategy. This is of particular importance as sanitation and drainage do not occupy a prominent position on the Government of Malawi's agenda.

6 IMPLEMENTATION PLAN, RESPONSIBILITIES AND RESOURCES

6.1 IMPLEMENTATION PLAN MATRIX

Implementation Plan Matrix is presented in **Error! Reference source not found.**.

6.2 KEY ASSUMPTIONS

The following key assumptions, but not limited to, may affect or derail the implementation of the Strategic Actions and therefore need to closely be monitored, dissolved and/or attended to:

- **Political Goodwill**: - The implementation of the Strategic Actions is on the premise that there will be political goodwill to finance and implement the actions. This transcends from Central Government to implanting entities such as LWB, LCC, RA and RFA among others.
- **Enabling Environment**: - It is assumed that the government will support the Strategy and take to review the existing legislations and enact the missing supporting pieces of relevant enabling legislations, policies, regulations, standards, and procedures. Alongside the existence of enabling legislations, policies, regulations, standards, and procedures, enforcement of the same is highly expected.
- **Streamlined Institutional Arrangements**: - Effective implementation will require an effective institutional arrangement that would support the implementation of the strategy without overlaps, abrogation of responsibilities and undertaking activities in a manner of "business as usual". Dedication and commitment to achieve will be required for the success of the implementation. There is need to review and undertake sector reforms, and where need be institutionalize/domesticate/implement the reforms. The existence of institutional arrangements alone, either provided by legislation or policy, is not adequate. Sector coordination is highly expected to achieve the objectives. Some key areas that are noted by the assessment of the existing situation in Lilongwe City where improved sector coordination is on land use planning, land allocation and administration in view of multiple land administrators in Lilongwe City, setting of buffer zone to protect natural resources and the environment, and enforcement of the legislation, policies, regulations, standards, and procedures.
- **Covid 19 pandemic**: Covid 19 pandemic has for the last 16 months affected National Economies, travel and infrastructure developments, it therefore hoped that the situation may improve.
- **Availability of resources required**: - Availability and continuous financing of infrastructure investments for implementing programmes is key for the implementation of the Strategy. Along this, the human capital, new or existing, deliberately assigned to oversee the implementation of the Strategy is required.
- **Incentives and Fiscal Discipline**: It is assumed that measures such as rolling out of Performance-based Management will be introduced to support commitment to achieve and ensure fiscal discipline.

- **Private Sector Participation**: - The emergence of an Enterprising Private Sector in the Sanitation Value Chain and Sanitation Marketing is essential. It was established through the assessment of the existing situation that not all services in the Sanitation Value Chain can be undertaken by the institutions mandated to provide municipal services. It is therefore hoped that business opportunities shall be explored and supported in the in the Sanitation Value Chain including drainage water re-use for various enterprises.
- **Improved Revenue Collection**: - Collection of enough Revenue to fund O&M Costs was seen to be lagging behind, more especially with LCC. It is therefore assumed that the situation will improve, identifying and resolving bottlenecks, and new financing streams shall be introduced within the scope of enabling legislation and regulations.
- **Citizenly Behaviour Change**: - It is assumed that through Effective Public Awareness Campaign, Promotion of Hygiene and Behaviour Change would lead to Citizenly change of behaviour such that social responsibility shall be exercised in relation to environmental sanitation, abuse of public services infrastructure, vandalism, among others.

Table 6.1 - Implementation Plan Matrix

#	Strategic Action	Specific objectives/ outputs	Activity Code	Activities	Output indicators	Timeframe (by When)	Responsible (by whom)	Budget in USD	Remarks
A. Enabling Environment									
A-1	Initiate and improve sector coordination groupings of key Sector players.	To improve sector coordination, set agenda, monitor performance	A1.1	***Hold regular sector meetings to (i) agree the Sector Vision & Agenda (ii) set performance monitoring criteria (iii) draw up 5-year business plan and regularly review annual plans performance, and (iv) improve the coordination and communication among and between the following groupings i.e.:***	Minutes and Actionable Task List	Bi-monthly	Responsible Process Owner	360,000	
			A1.2	Hold Joint Sector Reviews Workshop	JSR Annual Report	Annual	Director WSD, Ministry Responsible for Water	2,250,000	
			A1.3	Hold Sector Working Groups - but for Environment, Climate Change & Flood Control	Minutes and Actionable Task List	Quarterly	DEA	24,000	
			A1.4	Thematic Working Groups	Minutes and Actionable Task List	Bi-monthly	Chairpersons of TWG	72,000	
			A1.5	Facilitate District Coordination Team (DCT)	Minutes and Actionable Task List	Monthly	District WASH Head	36,000	
			A1.6	Facilitate 27 Wards - WASH Teams to plan, implement and monitor performance	Minutes and Actionable Task List	Quartely	Ward WASH Head	486,000	
			A1.7	WSDPG	Minutes and Actionable Task List	Bi-monthly	Head of the WSDPG	-	
A-2	Initiate formulation and/or harmonization of policies, legislation, and institutional frameworks relevant to efficient provision of Sanitation including FSM and SWM, and Drainage Services.	Harmonized Legal and Institutional Frameworks	A2.1	***Undertake legal, policy, institutional framework reviews***	Bills + Popular Version Paper	2022/23	Misters Responsible (MoFNR & MoLG) assisted by the Sector Heads DWSD & DLG-M	-	
			A2.2	Sector leads initiate drafting of relevant Bills and table to flow of Parliament or enactment of Acts.	Draft Bill Papers and Recommendations	2022	DWSD, DEA, DDLG-M	-	
			A2.3	Re-formulate and/or develop policies and institutional frameworks guided by the management option(s) and service delivery models.	Draft Policies and Recommendations	2022	DWSD, DEA, DDLG-M	-	
			A2.4	SWG and TWG thru Sector communication streams disseminate policies and economic instruments for buy-in.	Press Releases, Adverts, Brochures & Posts on Websites and Social Media	2023	Sector Heads & CEOS (LWB & LCC)	35,000	
A-3	Sector Reforms and Institutional Arrangement: domesticate Sanitation and Drainage Acts and Polices	To reform the Sector and streamline institution arrangements.	A3.1	***Undertake Sector reforms and institutional arrangements.***	Reformed Sector with a well streamlined Institutional Arrangements with clear Mandates, Roles and Responsibilities	2023	DWSD, DEA, DDLG-M	-	Internal Budget
			A3.2	Describe Roles and Responsibilities at:		2022	DWSD, DEA, DDLG-M	-	
			A3.3	@ National Sector Policy Level		2022	DWSD, DEA, DDLG-M	-	

#	Strategic Action	Specific objectives/ outputs	Activity Code	Activities	Output indicators	Timeframe (by When)	Responsible (by whom)	Budget in USD	Remarks
			A3.4	@ Local Level		2022	DWSD, DEA, DDLG-M	-	
			A3.5	@ Operational Level		2022	DWSD, DEA, DDLG-M	-	
A-4	Profile Sanitation and Drainage Functions at Operation Level	Onsite and Offsite Sanitation and Drainage Functions institutionalized and in place.	A4.1	***Operationalize Policies***	Functional Sector Units at Operational Level				
			A4.2	Develop and approve Organizational Structure		2022	Management & Board of LWB & LCC	-	
			A4.3	Develop and set performance targets		2022	CEOs (LWB & LCC)	-	
			A4.4	Develop and approve Job Descriptions and Key Result Areas.		20221	CEOs (LWB & LCC)	-	
			A4.5	Undertake Recruitment from open market of Key Positions.		2022	Management & Board of LWB & LCC	-	
			A4.6	Prepare a 5 Year Business Plan, annualized with SMART Actions and Targets		1st BP -2022; Then every 5 years; and APs- Annually	CEOs (LWB & LCC)	-	
			A4.7	Prepare Annual Plans			CEOs (LWB & LCC)	-	
			A4.8	Prepare and Approve Annual Budget			CEOs (LWB & LCC) and Board	-	
A-5	Formulate and disseminate Local regulations, Bylaws, and Standards, and performance indicators for each of the sub-sector	To develop and standardize operational instruments.	A5.1	***Facilitate development of by-laws to regulate on-site sanitation, FSM and SWM.***	Domesticated Regulations	2022	CEO LCC	-	Internal Budget
			A5.2	DCT and Utilities develop and disseminate.	Bylaws, Localized regulations, Standards, KPIs,	2022	Chair DTC	800	
			A5.3	Economic instruments		2022	CEOs (LWB & LCC)	-	
			A5.4	Regulations		2022	CEOs (LWB & LCC)	-	
			A5.5	Standards, and		2022	CEOs (LWB & LCC)	-	
			A5.6	KPIs and targets		2022	CEOs (LWB & LCC)	-	
			A5.7	LCC and LWB develop and roll out operational performance indicators	PIs and Targets	2022	CEOs (LWB & LCC)	-	
A-6	Undertake tariffs and tariff structure reviews and study: roll out a new tariff, levy or fees structure.	To develop tariffs and tariff structures for various customers	A6.1	Undertake tariff reviews & Study	Tariff and Tariff Structure and the Public Sensitized	2022/23	CEOs (LWB & LCC)	250,000	
			A6.2	Incorporate recommendations from previous studies & reviews		2022/23	CEOs (LWB & LCC)	-	
			A6.3	Seek approval from Board/ Government		2022/23	CEOs (LWB & LCC)	-	

#	Strategic Action	Specific objectives/ outputs	Activity Code	Activities	Output indicators	Timeframe (by When)	Responsible (by whom)	Budget in USD	Remarks
			A6.4	Disseminate Sanitation and Drainage Tariffs, Rates and Levy		2022/23	CEOs (LWB & LCC)	-	
A-7	Capacity Building and Training	To capacity build, equip, facilitate and assist the institutions to improve performance.	A7.1	Capacity building at all stages of service delivery: planning, designing, implementation, monitoring, and decision making phases to promote transformative leadership.	Capacity Building and Training Reports and Cap. Devt Assessments	Annual	DWSD, DEA, DDLG-M, CEOs (LWB & LCC)	1,500,000	
		To improve performance using incentive-based approach.	A7.2	Institutionalize performance management at Operational Level.	Performance Reports	Monthly	CEOs (LWB & LCC)	-	
A-8	Advocacy and Public Awareness	To improve public awareness and visibility	A8.1	Develop IEC Materials	IEC Materials	2022 and then Annually	CEOs (LWB & LCC)	1,500,000	
				Public sensitization drives and campaigns including participation on radio and TV talk shows.	No. Radio & TV Programs	Biannual	CEOs (LWB & LCC)	90,000	
			A8.2	Hold regular public meetings places, and places of worships.	No. of persons sensitized	Continuous Activity	CEOs (LWB & LCC)	Internal Budget	
				Conduct educational and career guidance talks for schools, youth and women groups.					
			A8.3	Participate actively in WASH International and National events/days i.e.			CEOs (LWB & LCC)	As below	
			A8.4	World Water Day		Annual	CEOs (LWB & LCC)	45,000	
			A8.5	Toilet Day (poo -day)			CEOs (LWB & LCC)	45,000	
			A8.6	International Day of Menstrual Hygiene Promotion.			CEOs (LWB & LCC)	45,000	
			A8.7	Environmental Day			CEOs (LWB & LCC)	45,000	
			A8.8	Organise Competitions for Schools and Women Groups	No of Schools & Groups Involved		CEOs (LWB & LCC)	150,000	
			A8.9	Hold WASH Annual Dinners to recognize and award best performing LIAs, Schools and Women Groups in WASH activities.			CEOs (LWB & LCC)		
A-9	Institutionalize Regulation and enforcement functions in the City	To institutionalize an effective and efficient enforcement mechanism	A9.1	Develop, set punitive measures and sanctions/penalties and disseminate.	Regulations & instruments in place	2022	CEOs (LWB & LCC)	-	
			A9.2	Set aside a budget for compliance and enforcement		Annual	CEO LCC	Internal Budget	Include on organizational Structure
			A9.3	Institutionalize an enforcement unit in LCC; support and operationalize functions with logistics and renumeration for first 3 years.	Functional Unit	2022	CEO LCC	1,389,000	
			A9.4	Monitor service delivery practices and level of services: Caution/ sanction offenders.	Monthly Reports	Continuous Activity	CEO LCC	-	
			A9.5	Institute Mobile & Instant Court with a Magistrate Level mandate to prosecute offenders within the local set-up and/or organization - first 3 years.	Functional Mobile Court	2022	CEO LCC in Liaison with the Judiciary	200,000	

#	Strategic Action	Specific objectives/ outputs	Activity Code	Activities	Output indicators	Timeframe (by When)	Responsible (by whom)	Budget in USD	Remarks
A-10	Monitoring Framework, Governance and Communication	To improve a performance monitoring tracking system, interface with the public, improve governance and communication.	A10.1	At Nation and Local Level institute an M&E Team	Functional M&E and Improved Communication	2022	DWSD, DEA, DDLG-M	-	
			A10.2	Develop an M&E framework and mechanism.		2022	Chair SWG	-	
			A10.3	Design a monitoring and check-list template.		2022	Chair SWG	-	
			A10.4	Facilitate and incentivise Block - San-Health Teams to bi-annually monitor WASH Performance (27 wards x 4 blocks)		2022	Director Health	486,000	
			A10.5	Set response time target to respond to complaints.		2022	CEOs (LWB & LCC)	-	
			A10.6	Develop and run a WASH website portal		2022 & Maintained yearly	DWSD	85,000	
			A10.7	Actively engage the publics on social media.		2022	CEOs (LWB & LCC)	90,000	
			A10.8	Develop and roll out a PR feedback mechanism digital system.		2022	DWSD	20,000	
			A10.9	Publish the JSR Annual Report	1000 full colour Report	Annual	DWSD	45,000	
			A10.10	Publish Sector performance in news print.	Full Page Supplement in 3 Newspapers	Bi-annually	DWSD, DEA, DDLG-M	300,000	
A-11	Technical Assistance and Support to Pillars (A, B &C)	To support Programme Ket development Areas	A11.1	Develop and Support Key Sector Development Areas	Programmes/Thematic Groups Supported	Continuous Activity	DWSD, DEA, DDLG-M	7,500,000	
		Provide TA for five key positions in LCC & LWB	Aii.2	Technical Assistance - Technical & Business Streams in LCC & LWB to improve technical and financial sustainablity.	Improved systems, streams and financial viability	2022 -2025	CEOs (LWB & LCC)	2,952,000	
		To improve complaints handling, resolution and feedback.	A11.3	Establish a Call Centre with free toll telephone numbers; operate is for 15 yrs.	Call Centre Establishment & Maintenance	2023	CEO - LCC	2,150,000	
Total Enabling Environment								**22,150,800**	
B. Enhance/Create Demand									
(Bi) Onsite and Offsite Sanitation									
Bi-1	Awareness raising and sanitation marketing	Improved sanitation, hygiene and behavioural practices	Bi-1.1	Develop promotional materials to increase adoption of improved hygiene practices	Promotional Materials	Immediate	LCC	135,000	
			Bi-1.2	Design and implement a citywide sanitation and hygiene marketing campaign - via multiple communication channels	Evaluation Report	Short-term	LCC, NGOs	7,500,000	
			Bi-1.3	Periodically assess the campaign's effectiveness and realign strategies if necessary	Monitoring Report	Continuous	LCC	375,000	
Bi-2	Market development	Scale-up economy for improved sanitation products and services	Bi-2.1	Develop financial products tailored towards sanitation and hygiene improvements at household level	No. of Products Developed	Short-term	LCC, Financial Institutions	45,000	
			Bi-2.2	Identify masons and support them with technical, marketing and business-oriented training to become certified sanitation entrepreneurs	No. of Certified Entrepreneurs	Immediate	LCC, NGOs	45,000	

#	Strategic Action	Specific objectives/ outputs	Activity Code	Activities	Output indicators	Timeframe (by When)	Responsible (by whom)	Budget in USD	Remarks
			Bi-2.3	Continuous business support and mentorship for the most motivated and promising entrepreneurs	No. of Trainings	Continuous	LCC, NGOs	75,000	
Bi-3	Regulation enforcement	Reduction in unhygienic and undesirable sanitation practices	Bi-3.1	Review and update Lilongwe's sanitation bylaws and standards	Updated Sanitation Bylaws and Standards	Immediate	LCC, MoLG	33,750.00	
			Bi-3.2	Review and update Lilongwe's minimum construction standards	Updated Minimum Construction Standards	Immediate	LCC, MoLG	33,750.00	
			Bi-3.3	Monitor compliance to sanitation and housing standards, and bylaws	Compliance Report	Continuous	LCC	75,000	
Bi-4	Public incentives	Increase access to improved sanitation in low-income areas	Bi-4.1	Design a partial subsidy scheme for vulnerable households to meet their sanitation financing gaps	Feasibility Report	Short-term	LCC	45,000	
			Bi-4.2	Implement the sanitation subsidy scheme	No. of Sanitation Facilities	Short-term	LCC, NGOs	2,800,000	
			Bi-4.3	Periodically assess the subsidy scheme's effectiveness and realign the approach if necessary	Monitoring Report	Continuous	LCC	140,000	
	Sub-total							**11,302,500.**	
C. Strengthen Supply of Infrastructure and Services									
(Ci) Onsite and Offsite Sanitation									
Ci-1	Standardise technology options	Promote access to affordable sanitation products	Ci-1.1	Develop a catalogue with upgradeable, low-cost sanitation products	Catalogue of Sanitation Products	Short-term	LCC	101,250	
			Ci-1.2	Continuous product development as consumer needs evolve	Updated Catalogue	Continuous	LCC	35,000	
Ci-2	Improve the existing facilities	Rehabilitated sewer network, and improved institutional and public sanitation	Ci-2.1	Develop a rehabilitation and expansion plan for the sewer network	Detail designs	Short-term	LWB	1,050,000	Includes detail design of P3 and P4 sewer networks
			Ci-2.2	Rehabilitate and expand priority trunk sewers and collectors	Km of Sewer Network	Short-term	LWB	28,944,000	Includes P1 +P2 priority neworks
			Ci-2.3	Rehabilitate and expand the sewer network (trunks and collectors)	Km of Sewer Network	Medium / Long-term	LWB	28,970,000	
			Ci-2.4	Establish the rehabilitation needs of the five main wastewater treatment plants	Detail designs	Immediate	LWB	1,437,000	
			Ci-2.5	Rehabilitate and increase the capacity of the five main wastewater treatments plants (Kauma, Lumbadzi, Kanengo, Kamuzu and KIA)	Installed wastewater treatment capacity m3/day	Short-term	LWB	19,583,000	
			Ci-2.6	Develop and implement a citywide plan to rehabilitate sanitation and hygiene facilities in public primary schools	No. of School WASH Facilities Rehabilitated	Short-term	LCC, MoEST	750,000	
			Ci-2.7	Develop and implement a citywide hygiene and sanitation improvement campaign to cover all public health centres	Monitoring Report	Short-term	LCC, MoH	450,000	
			Ci-2.8	Establish minimum tariffs, operations protocol, and O&M plans for Public Sanitation Facilities	SOPs for Public Toilets	Short-term	LCC	135,000	
			Ci-2.9	Enforce minimum hygiene standards and SOPs for Public Sanitation Facilities	Inspection Reports	Continuous	LCC	112,500	

#	Strategic Action	Specific objectives/ outputs	Activity Code	Activities	Output indicators	Timeframe (by When)	Responsible (by whom)	Budget in USD	Remarks
			Ci-2.10	Procure and deploy Hydrocleaners for sewers O&M in Lilongwe City, including replacements vehicles after its life span.	No. of operational Hydrocleaners	Short-term	LCC/ private operators	1,040,000	
						Medium-term	LCC/ private operators	2,080,000	
						Long-term	LCC/ private operators	520,000	
Ci-3	Improve efficiency of FS collection and transport	Lower FS transport costs to make safe pit-emptying services viable	Ci-3.1	Procure and deploy vacuum suction tankers and vacutag trucks to enhance pit-emptying capacity in Lilongwe City, including replacements vehicles after its life span.	No. of operational vacuum tankers and vacutags	Short-term	LCC/ private operators	14,068,000	
						Medium-term	LCC/ private operators	3,229,000	
						Long-term	LCC/ private operators	16,755,000	
			Ci-3.2	Identify locations for FS transfer stations (mobile or fixed) at strategic locations	Detail design	Immediate	LCC	215,000	
			Ci-3.3	Establish priority FS transfer stations (mobile or fixed) at strategic locations	No. of Transfer Stations	Short-term	LCC	1,483,000	
			Ci-3.4	Establish FS transfer stations (mobile or fixed) at strategic locations	No. of Transfer Stations	Medium/ Long-term	LCC	1,825,000	
Ci-4	New infrastructure investments	Increase access to improved sanitation and hygiene	Ci-4.1	Explore the feasibility of decentralized wastewater treatment systems (DEWATS)	Detail design	Immediate	LCC, LWB	101,000	
			Ci-4.2	Design and Construct DEWATS in selected areas	No. of DEWATS	Short-term	LCC, LWB	1,750,000	
			Ci-4.3	Detail design of new faecal sludge treatment plants (total capacity of 1,100 m3/day)	Detail design	Immediate	LWB	2,304,000	Consultancy estimates includes supervision phase
			Ci-4.4	Construction of three faecal sludge treatment plant (at Kanengo; Ngwenya, West side) with capacity for 365 m3/day each.	Installed FS treatment capacity m3/day	Short/ Medium-term	LWB	37,441,000	Prioritisation for the FSTPs: Ngwenya>West Side>Kanengo.
			Ci-4.5	Reserve/ acquisition of land for future FSTP (Alimaunde and Ngwenya expansion)	Installed FS treatment capacity m3/day	Long-term	LWB	2,305,000	
			Ci-4.6	Develop and implement a citywide plan for new sanitation infrastructure in public primary schools	No. of New School WASH Facilities	Short-term	LCC, MoEST	1,050,000	
Ci-5	Capacity Building and Training	Sustainable sanitation services	Ci-5.1	Develop SOPs and training modules for FS emptying services to professionalise and regulate the industry	SOPs and Training Modules	Immediate	LCC	56,250	
			Ci-5.2	Provide training to FS emptying operators based on the modules and license the trained operators	No. of Licensed Operators	Short-term	LCC, NGOs	5,000	
			Ci-5.3	Continuous business support services for FS emptying services and other sanitation entrepreneurs	No. of Trainings	Continuous	LCC, NGOs	75,000	
								167,870,000	
Total Sanitation - Onsite and Office Site								179,172,500	,
B. Enhance/Create Demand									
(Bii) Drainage									
Bii-1	Mitigate environmental and public health impacts through public awareness and involvement.	Attain a healthy living and workplace environment in Lilongwe City with the	Bii1.1	Undertake awareness campaign on preservation of buffer zones and the risks of encroachments through mass media and communication products.	Quarterly awareness campaigns undertaken in each year.	Quarterly from last quarter of 2021	LCC	42,000	City tours with megaphones lasting 7 days, conducted twice in each Quarter for 9 Quarterly periods.

#	Strategic Action	Specific objectives/ outputs	Activity Code	Activities	Output indicators	Timeframe (by When)	Responsible (by whom)	Budget in USD	Remarks
		participation of the city residents.			Types and quantity of information products (leaflets, city billboards, radio and TV clips) prepared, produced, displayed and distributed.	Quarterly from last quarter of 2021	LCC	216,000	Conducted twice in each Quarter for 9 Quarterly periods.
			Bii1.2	Engage private sector and promote business opportunities in the service chain.	At least 1 No. engaging undertaken in each half of the year from 2021 to 2022	2021 to 2022	LCC	36,000	
			Bii1.3	Undertake inclusive planning and implement solid waste management in the City.	Annual solid waste management plan prepared by end-Dec. 2021	Annually by end-Dec.	LCC	12,000	
Bii-2	Promote rainwater and floodwater harvesting for water reuse and to reduce runoff in the City.	Reduced runoff from rainwater requiring drainage and promote rainwater use.	Bii2.1	Prepare and distribute information leaflets on rainwater harvesting and rain water use.	Types and quantity information products (leaflets, radio and TV clips) prepared, produced, displayed and distributed	Quarterly from final quarter of 2021	LCC	144,000	Conducted twice in each Quarter for 9 Quarterly periods.
			Bii2.2	Prepare and mount billboards in the city's strategic locations on rainwater harvesting and rain water use.	At least 5 No. billboards mounted in the city by mid-2022	Mid-2022	LCC	20,000	
Bii-3	Increase customer satisfaction through responsive drainage services.	Ensure customer satisfaction through timely response to service requests, public complaints, notices or inquiries regarding drainage conditions and problems in the City.	Bii3.1	Establish a call centre with dedicated staff to cater for customer feedback for all municipal services.	LCC Call Centre established and functional by the end of 1st Quarter of 2022.	End-March 2022	LCC	286,000	Cost of rental, communication, equipment and short courses. Existing staff to be reassigned to this role with some training on customer relations. To be in existence up to 2035.
Bii-4	Reduce the risk of flooding for private property and public spaces arising from both storm water and flooding rivers.	Protect natural watercourses across the city from deterioration and avert the risk of human activity influenced flooding into the city.	Bii4.1	Establish riverine and streams buffer zone distance and seek it to be legislated.	Buffer zone distance established and process to legislate commenced by end-March 2022.	End-March 2022	NWRA		Activity to be undertaken together with law review activity Cii5.2.
			Bii4.2	Set riverine and streams buffer zones along the natural water courses that run through the city.	Buffer zone marked with visible pillars along water bodies by end-2022.	End-2022	NWRA	208 390.00	At every 50 m on both sides of the 68.7 km length of natural watercourses across the City. Works include site clearing, excavation, concreting.
			Bii4.3	Undertake public awareness campaigns on the set buffer zones, the ills of encroachment and penalties.	Quarterly awareness campaigns undertaken in each year.	Quarterly from first quarter of 2022	NWRA	42,000	City tours with megaphones

#	Strategic Action	Specific objectives/ outputs	Activity Code	Activities	Output indicators	Timeframe (by When)	Responsible (by whom)	Budget in USD	Remarks
Bii-5	Provide for sustained engagement and solutions for city land use.	Ensure discipline and observance of environment and water resources protection laws, land use plans and restore sanity.	Bii5.1	Undertake awareness on laws relating to illegal development in buffer zones, fragile and sensitive areas, and in reserved land for public services.	Types and quantity of information products (leaflets, city billboards, radio and TV clips) prepared, produced, displayed and distributed.	Quarterly from last quarter of 2021	LCC		To be undertaken together with activity Bii1.1
			Bii5.2	Enforce land use plans and relevant laws, monitor and stop emergence of new settlements in protected areas.	Number of encroachment incidences stopped and penalties effected.	Continuous from last Quarter of 2021.	LCC	70,560	Monthly city patrols over 27 months to monitor developments
			Bii5.3	Reclaim the encroached land.	All encroached land reclaimed by end-2022.	End-2022	LCC	285,000	Restoration works for reclaimed land. No compensation expected for illegal developments.
	Sub Total							**1,153,560**	
	C. Strengthen Service								
	(Cii) Drainage and Flood Control Measures								
SO1	*Ensure Environmental Health and Well Served City Residents For Healthy Living Conditions*								
Cii-1	Mitigate environmental and public health impacts from combined sewers and drainage overspills, and solid waste.	Attain a healthy living and workplace environment for residents in Lilongwe City.	Cii1.1	Resource LCC and relevant government entities to enforce laws on waste disposal and illegal dumping of solid waste.	LCC with resources and implementing enforcement efforts.	End-March 2022	MoL/GoM	131,040	Monthly city patrols over 36 months with an annual budget of USD 43,680 to monitor developments in the city.
			Cii1.2	Undertake drainage infrastructure maintenance.	Bi-annual maintenance being implemented.	Bi-Annually from 2022	LCC	2,626,000	
			Cii1.3	Engage private sector on the roles they could play in service delivery and the business opportunities in the service chain.	At least one stakeholders workshop/meeting held in each half of the year	Bi-Annually from 2022	LWB/LCC	36,000	Spread over 3 half yearly periods.
			Cii1.4	Plan and implement solid waste management in the City.	At least one stakeholders workshop/meeting held in each half of the year	Bi-Annually from 2022	LCC	12,000	
Cii-2	Pilot and promote rainwater and floodwater harvesting for water reuse and to reduce runoff in the City.	Reduced runoff from rainwater requiring drainage and promote rainwater use.	Cii2.1	Assess the costs and benefits of rainwater and floodwater harvesting for water reuse.	Assessment Consultancy implemented by June 2022.	June 2022	LCC	61,000	
			Cii2.2	Undertake rainwater harvesting at public infrastructure such as schools and at market structures.	Rainwater harvesting piloted at 10 Market ablution structures and at 10 Schools in Lilongwe City by end-December 2025.	End-December 2025	LCC	1,823,000	Implementing at least two schools and two markets in each year up to 2025.
			Cii2.3	Construct detention ponds to collect flood waters.	2 No. detention ponds constructed by 2030.	End-December 2026	LCC		To be undertaken together with activity Cii7.5

#	Strategic Action	Specific objectives/ outputs	Activity Code	Activities	Output indicators	Timeframe (by When)	Responsible (by whom)	Budget in USD	Remarks
			Cii2.5	Promote rainwater harvesting from roof tops in the city for various uses such as flower gardening, lawns watering, car washing, etc.	Quarterly rainwater harvesting promotion activities undertaken from final quarter of 2021.	Quarterly from final quarter of 2021	LCC		To be undertaken together with activity Bii2.1
Cii-3	Increase customer satisfaction through responsive drainage services.	Ensure customer satisfaction through timely response to service requests, public complaints, notices or inquiries regarding drainage conditions and problems in the City.	Cii3.1	Establish a call centre with dedicated staff to cater for customer feedback for all municipal services.	LCC Call Centre established and functional by the end of 1st Quarter of 2022.	End-March 2022	LCC		To be undertaken together with activity Bii3.1
Cii-4	Drainage Services O&M and new infrastructure provided with a budget to enable attainment of goals and operations towards customer satisfaction.	Drainage services recognised in the budget and in development plans, with specific resources for maintenance and new infrastructure identified and allocated.	Cii4.1	Seek legal opinion on legally acceptable revenue sources for the City Assembly and seek direction for their implementation.	Legal opinion requested and provided by the end of 1st Quarter of 2022.	End-March 2022	LCC		To be implemented within office function.
			Cii4.2	Review municipal services financing structure and provide a drainage services budget in each FY Budget up to 2035.	Municipal Services revenue streams established and drainage with a budget by end-December 2022.	End-December 2022	LCC		Activity to be undertaken within the budgeting process.
			Cii4.3	Dedicate staff to undertake project proposal writing for small grants and investment financing.	Specific staff assigned the role of project development and undertaking project proposal writing by end-December 2022.	End-December 2022	LCC	2,000	Provide short course to at least three designated staff on project preparation and planning.
			Cii4.4	Prepare financing plan and budget and seek from government financing for matching funds.	Financing plan prepared and submitted to government by December 2022.	December 2022	LCC	12,000	Undertake planning sessions.
			Cii4.5	Seek external development financing support with project proposals submitted for grants and borrowing with government support.	Initial project proposal(s) developed and submitted for financing by December 2022.	December 2022	LCC		To be implemented within office function.
			Cii4.6	Lobby government to provide matching funds alongside institutional structuring for effective customer focused service delivery starting with FY 2021-2022.	Financing plan prepared and government requested for matching funds by December 2022.	December 2022	LCC		To be implemented within office function.
Cii-5	Apply and ensure a fair and equitable tariff structure that supports the necessary	A clear and transparent tariff structure for	Cii5.1	Engage stakeholders on the need for regulations relating to drainage services and urban waste water management.	One stakeholders workshop held by mid-2022.	Mid-2022	LCC	12,000	

#	Strategic Action	Specific objectives/ outputs	Activity Code	Activities	Output indicators	Timeframe (by When)	Responsible (by whom)	Budget in USD	Remarks
	Drainage Services initiatives and demonstrates to customers the value they receive for the tariffs they pay.	services developed and applied.	Cii5.2	Lobby for the preparation of missing regulations, including Tariff Setting Regulations and set and implement the tariffs.	Law Reform Commission, Members of Parliament and sector stakeholders engaged for missing regulations and supporting legislations by mid-2022.	Mid-2022	LCC	74,000	Legal Consultancy, Workshops and meetings to be used.
			Cii5.3	Set tariff and apply tariff for services not tariffed such as sewerage, drainage and solid waste management.	Tariffs set and applied End-2022.	End-2022	LCC		To be implemented within office function.
Cii-6	Creating and maintaining the best possible motivated workforce in terms of work safety, productivity, customer service, employee welfare and training.	Enhance productivity and work culture that meets customer satisfaction through effective institutional structure, trained and motivated staff.	Cii6.1	Undertake stakeholder consultations on the roles and best governance structure for City Assemblies with case studies from other Cities in the region and elsewhere.	One stakeholders consultation workshop held by mid-2022.	Mid-2022	LCC	12,000	
			Cii6.2	Undertake institutional review for effective customer focused service delivery and institutional efficiency.	Institutional review Consultancy undertaken by December 2021.	End-December 2021	LCC	62,000	Consultancy, Workshops and meetings to be used.
			Cii6.2	Undertake institutional restructuring and effect revised departmental and roles for effective customer focused service delivery.	Institutional restructuring undertaken by the end of the 1st Quarter of 2022.	End-March 2022	LCC		To be implemented within office function.
			Cii6.3	Undertake review and adjustment of staff remuneration to attract relevant and more experienced and skilled staff, and to motivate the existing.	Staff and departmental roles realigned with new job descriptions effected by the end of the 1st Quarter of 2022.	End-March 2022	LCC		To be implemented within office function.
			Cii6.4	Engage other Cities in the region and elsewhere and explore a working arrangement.	Sister Cities relationships effected by Mid-2022.	Mid-2022	LCC	31,000	Travel costs
			Cii6.5	Undertake annual staff exchange for exposure and on-the-job training.	Staff exchange arrangements commenced by end-December 2021.	End-December 2021	LCC	136,000	At least 3 staff annually on exchange on various disciplines for 6 months for the first 5 years of the plan.
			Cii6.6	Undertake training needs assessment and budget for the necessary training for the immediate, medium term and long term.	Training needs assessment Consultancy undertaken by the end of the 1st Quarter of 2022.	End-March 2022	LCC	50,000	
			Cii6.7	Schedule and implement relevant training for deserved positions targeting performance improvement for the institution.	Staff training schedule prepared and short term training commenced by Mid-2022.	Mid-2022	LCC	146,000	Annual local and international training implemented over the first 5 years period of implementation.
	Sub Total							**5,226,040**	
SO2	*Ensure Resilient and Sustainable Drainage Infrastructure*								

#	Strategic Action	Specific objectives/ outputs	Activity Code	Activities	Output indicators	Timeframe (by When)	Responsible (by whom)	Budget in USD	Remarks
Cii-7	Reduce the risk of flooding to private property and public spaces arising from both storm water and flooding rivers.	Reduced risk of flooding to private property and public spaces through preventive and protective measures.	Cii7.1	Set riverine and streams buffer zones along the natural watercourses and undertake public awareness campaigns on the same.	Buffer zone awareness campaigns undertaken and zones marked with visible pillars along water bodies by end-2022.	End-2022	NWRA		Activity to be undertaken together with activity Bii4.2 and activity Bii1.1
			Cii7.2	Enforce laws that prohibit cultivation and any form of activity that destabilize the natural watercourses buffer zones and their catchment.	Number of encroachment incidences stopped and penalties effected.	Continuous from last Quarter of 2021.	NWRA	50,400	Monthly city patrols over 27 months to monitor developments along the water courses.
			Cii7.3	Seek evacuation of all developments within the buffer zone.	All encroached land reclaimed by 2030.	Medium Term	NWRA	32,076,000	Restoration works for reclaimed zones, including demolition and reseatlement costs.
			Cii7.4	Plan and implement flood protection measures across the City.	City flood protection measures plans prepared and implementation of immediate measures commenced by 2023	Immediate / Short-Term	LCC	610,000	Includes consultancy and implementation works for Hydraulic road-crossing structures and Erosion protection - high priority works
					Protection of additional river reaches	Medium Term	LCC	3,809,000	Includes consultancy and implementation works for Erosion protection - medium priority works
					Study and implementation of measures for restoration of dambos and greenery across the rivers of Lilongwe City	Short Term	LCC/ NWRA	4,679,000	includes consultancy and implementation works
			Cii7.5	Construct flood detention and retention ponds across the City and provide for water reuse.	At least 2 No. detention ponds and 2 No. retention ponds constructed by 2030.	Immediate/ Medium Term	LCC	983,000	
Cii-8	Implement projects to manage the potential impacts of climate change through adaptation of current Climate trends in drainage infrastructure upgrading/expansion and new drainage infrastructure development.	Develop new drainage infrastructure which is adaptive to Climate Change trends and enhance Climate Change effects monitoring in order to protect life and property in Lilongwe City.	Cii8.1	Undertake feasibility and preliminary design for the implementation of City drainage infrastructure.	Feasibility study undertaken by end-2022.	End-2022	LCC	300,000	
			Cii8.2	Prepare detailed design for city drainage works.	Detail Design for drainage system expansion	Immediate	LCC	192,000	Development of new drainage infrastructures Consultancy
						Medium Term	LCC	401,000	
						Long Term	LCC	377,000	
					Detail Design for upgrading drains and culverts in critical areas	Immediate	LCC	225,000	Detail design of high priority upgrading works.
						Medium Term	LCC	128,000	Detail design of medium priority upgrading works.
			Cii8.3	Tender and implement new construction and infrastructure upgrading works.	km of Drainage System Constructed	Short Term	LCC	3,056,000	Implement new construction works.

#	Strategic Action	Specific objectives/ outputs	Activity Code	Activities	Output indicators	Timeframe (by When)	Responsible (by whom)	Budget in USD	Remarks
						Medium Term	LCC	4,587,000	Implement new construction works.
						Long Term	LCC	4,301,000	Implement new construction works.
					km of drains and culverts upgraded in critical areas	Short Term	LCC	2,248,000	Upgrading of drains and culverts in critical areas - High Priority
						Medium Term	LCC	1,276,000	Upgrading of drains and culverts in critical areas - Medium Priority
			Cii8.4	Reinstated to working order river gauging instruments for rivers crossing Lilongwe City to provide accurate and reliable data for flood estimation.	River gauging stations and measuring instruments repaired, rehabilitated and new installations undertaken..	Immediate	NWRA	1,094,000	Includes consultancy and implementation. At least existing stations brought to good working order by end-2022 and new installations by end-2023.
Cii-9	Undertake proactive maintenance, rehabilitation and replacement of infrastructure coupled with increased monitoring, inspection and assessment of their condition and their reserved land.	Restore to working order the existing drainage infrastructure to minimise the effect of flooding conditions in Lilongwe City.	Cii9.1	Provide equipment and tools for maintenance of city drainage infrastructure.	Required and adequate maintenance tools and equipment procured by end-2022.	End-2022	LCC	100,000	
			Cii9.2	Undertake regular maintenance of drainage infrastructure.	Bi-annual maintenance being implemented.	Mid-2022	LCC		Activity to be undertaken together with activity Cii1.2
			Cii9.3	Assess the existing drainage infrastructure for rehabilitation and connectivity to main drainage infrastructure and natural water ways.	Drainage infrastructure assessment for rehabilitation works undertaken by end-2022.	End-2021	LCC	75,000	Activity to be undertaken with activity Cii8.2
			Cii9.4	Undertake rehabilitation of existing drainage infrastructure and restore carrying capacity.	Drainage infrastructure priority rehabilitation works commenced by mid-2022.	Immediate / Short-Term	LCC	2,606,000	
Cii-10	Enhanced infrastructure data collection and mapping and utilise the data gathered for asset management, planning, design, construction, and maintenance.	Ensure informed planning and decision making through knowledge base.	Cii10.1	Undertake city drainage infrastructure mapping and coding.	City drainage infrastructure mapped by end-December 2021.	Annually	LCC	592,000	Yearly maintenance of the database establish activity Cii 10.2 (average yearly cost of 39,500 USD)
			Cii10.2	Prepare infrastructure database and information management system.	City drainage infrastructure database and information management system developed by end-December 2021.	Immediate	LCC	103,000	To be implemented together with activity Cii10.1
	Sub total							**63,568,700**	
SO3	*Ensure Effective Governance Capacity for Effective and Efficient Service Delivery*								

#	Strategic Action	Specific objectives/ outputs	Activity Code	Activities	Output indicators	Timeframe (by When)	Responsible (by whom)	Budget in USD	Remarks
Cii-11	Provide for enabling environment with harmonised Laws and Policies to enhance performance, coordination and effective inter-sectoral participation which includes the participation of the private sector and the city communities.	Ensure effective governance that is supported by comprehensive Laws and Policies that speak to each other.	Cii11.1	Undertake stakeholders consultations to understand operations and services constricted by existing legal and policy framework, and for consensus on the required changes and required enabling registrations.	One stakeholders workshop held by mid-2022.	Mid-2022	LCC	12,000	Workshops and meetings to be used.
			Cii11.2	Lobby for the review and update of the legislation that governs the existence and the operations of Local Authorities to clearly assign drainage services delivery mandate, solid waste management and sanitation within the City areas.	Law Reform Commission, Members of Parliament and sector stakeholders engaged to support updating of legislations by mid-2022.	Mid-2022	LCC		Activity to be implemented together with activity Cii5.2
			Cii11.3	Seek government support for legal and policy review.	Position paper submitted to Cabinet for consideration.	End-September 2022	MoLG/LCC		To be implemented within office function.
			Cii11.4	Undertake legal and policy review.	Legal and policy review undertaken by the end of the 3rd Quarter of 2022.	End-September 2022	MoLG/LCC		Legal Consultancy, Workshops and meetings to be used.
			Cii11.5	Lobby for the preparation of missing regulations alongside the law review.	Law Reform Commission, Members of Parliament and sector stakeholders engaged to support the need for regulations by mid-2022.	Mid-2022	LCC		Activity to be implemented together with activity Cii5.2
			Cii11.6	Engage sector players with the objective of continuous collaboration, coordination and information sharing.	Sector players engaged for a long-term sector working arrangement.	Mid-2022	Ministry responsible for Water & Sanitation / MoLG	6,000	
			Cii11.7	Setup a working platform for continuous collaboration and information sharing.	Long-term sector working forum established by the end of the 3rd Quarter of 2022.	End-September 2022	Ministry responsible for Water & Sanitation / MoLG	336,000	Workshops and meetings to be used for Quarterly engagements through to 2035.
Cii-12	Provide for sustained engagement and solutions for city land management and administration, addressing the emergence of unplanned settlements and encroachment into reserved service areas.	Attain coordinated land administration that recognises and protect public services land requirements in the city and information sharing.	Cii12.1	Engage Lilongwe urban and peri-urban land administrators to review land use challenges arising form land allocations affecting municipal services delivery.	Lilongwe urban and peri-urban land administrators engaged on challenges faced by land administration by end-December 2021.	End-December 2021	LCC	6,000	
			Cii12.2	Establish an effective land governance arrangement for all land administrators in the urban and peri-urban areas of Lilongwe City that would avoid misallocation of land.	Lilongwe urban and peri-urban land administrators working arrangement agreed by end of 2022 1st quarter.	End-March 2022	LCC		Implementation of this activity to be undertaken together with activity Cii11.7
			Cii12.3	Undertake awareness on laws relating to illegal development and developments in fragile and sensitive areas, and on land reserved for public services.	Quarterly awareness campaigns undertaken in each year.	Quarterly from first quarter of 2022	LCC		To be undertaken together with activity Bii1.1

#	Strategic Action	Specific objectives/ outputs	Activity Code	Activities	Output indicators	Timeframe (by When)	Responsible (by whom)	Budget in USD	Remarks
			Cii12.4	Enforce Laws, stopping new settlements in protected areas and reclaim the encroached land areas.	Number of encroachment incidences stopped, penalties effected and encroached land reclaimed by end-2022.	End-2022	LCC		To be undertaken together with activity Bii5.2
			Cii12.5	Assess the existing informal settlements for upgrading.	Informal settlements assessed for upgrading with upgrading plans prepared by end-December 2022.	End-December 2022.	LCC	300,000	Consultancy
			Cii12.6	Update urban plans and secure land reserved for services infrastructure.	Urban land use plans updated and land secured and reserved for services infrastructure by end-December 2022.	End-December 2022.	LCC	12,000	Workshops and meetings to be used.
			Cii12.7	Prepare informal settlements upgrading project proposal for seeking financial support	Urban informal settlements upgrading project proposal by end-December 2022.	End-December 2022.	LCC	6,000	
			Cii12.8	Seek financing for upgrading of informal settlements with municipal services and communal facilities provided for a health living environment.	Urban informal settlements upgrading project proposal submitted to government and potential donors for financial support by end-December 2022.	End-December 2022.	LCC		To be implemented within office function.
	Sub Total							**678,000**	
				Total Drainage				**70,626,300**	
				SOLID WASTE MANAGEMENT					
				(Di) Goal 1: Effective Institutional Framework and Legislation relevant to efficient provision of SWM services in the Lilongwe City Council (LCC)					
SWM1	*To Establish and Implement an effective and harmonized institutional Framework and integrated legislative system and to build institutional capacity.*								
Di-1	Policies and economic instruments on waste reduction	*To Establish and Implement an effective and harmonized institutional Framework and integrated legislative system and to build institutional capacity*	Di-1.1	Develop and harmonize policies and economic instruments	Laws Harmonised	Immediate	LCC,MLGRD,EAD,DJ	150,000	Policies, instruments and Legislative Frameworks need urgent harmonization
			Di-1.2	Implement policies and economic instruments	Bylaws reviewed	Immediate	LCC,MLGRD,EAD,DJ		
					Instruments formulated	Medium Term	LCC,MLGRD,EAD,DJ		
Di-2	Uptake of efficient technologies		Di-2.1	Undertake benchmarking on best practices of appropriate technologies		Medium Term	LCC,MLGRD,EAD,DS&T	72,000	
Di-3	Compliance and Enforcement of waste management laws and standards		Di-3.1	Monitor good environmental practices, conduct Compliance inspections and take enforcement actions	No. of cases resolved	Medium Term	LCC,MLGRD,EAD, Police	286,000	

#	Strategic Action	Specific objectives/ outputs	Activity Code	Activities	Output indicators	Timeframe (by When)	Responsible (by whom)	Budget in USD	Remarks
(Dii) Goal 2: Improve and Strengthen SWM system in the City of Lilongwe in line with 4Rs Principles.									
SWM1	*Waste Segregation and Separation At Source*								
Dii-1	Waste segregation initiated and supported	To introduce effective *waste segregation and separation at Source*	Dii1.1	Provide equipment for waste segregation at public places (triflux containers); creating green points/ sorting bays	No. of Sorting sites established and right receptacles available (green points/ sorting bays)	Short Term	LCC,MLGRD, NGOs	100,000	
						Medium term		141,000	includes replacement costs
						Long Term		145,000	includes replacement costs
			Dii1.2	Provide transport systems for segregated waste	No. of waste collection vehicles for Sorted waste available	Short Term	LCC,MLGRD,Private Sector	486,000	
						Medium term		425,000	
						Long Term		668,000	includes replacement costs (5 ton trucks)
SWM2 DRIVE 2 - Waste Collection Infrastructure									
Dii-2-1	Waste management facilities	To increase waste collection rate and manage SW efficiently and effectively.	Dii2-1.1	Upgrade existing waste management facilities	landfill cells volume	Immediate	LCC,MLGRD,Private Sector	3,056,000	
			Dii2-1.2	Construction of new Landfill	landfill cells volume	Medium		4,687,000	
			Dii2-1.3	Expansion of Landfill capacity - new cells	landfill cells volume	Medium/ Long Term		5,228,000	
			Dii2-1.4	Landfill - Mobile Equipment	No. of waste collection vehicles available (s)	Immediate		823,000	includes in each landfill: Joper Water Tank, Frontend Loader (Shovel Loader),Backhoe Loader and a BOMAG Compactor.
						Medium term		1,645,000	
						Long Term		823,000	includes replacement costs
			Dii2-1.5	Dump /Landfill - Cell closure	landfill cells volume	Short Term		2,430,000	
						Medium term		1,823,000	
Dii-2-2	Waste collection and transportation systems.		Dii2-2.1	Provide adequate and appropriate collection facilities and services	No. of Skips and 240l bin containers available	Short Term	LCC,MLGRD,Private Sector	990,000	
						Medium term		2,030,000	
						Long Term		2,160,000	
			Dii2-2.2	Provide adequate and appropriate transport systems	No. of waste collection vehicles available (skip carriers and compactor trucks)	Short Term	LCC,MLGRD,Private Sector	719,000	
						Medium term		1,481,000	
						Long Term		1,168,000	
			Dii2-2.3	Transfer stations	No. of new waste transfer stations	Short Term	LCC,MLGRD, NGOs,CBO, ,Private Sector	627,000	
SWM3	Drive 3 Social Improvement								
Dii-3-1	Formalise waste pickers		Dii3-1.1	Utilising International Best Environmental Practices (BEP) and Best available Technologies (BAT)	No. of waste Pickers formalised	Medium Term	LCC,MLGRD,EAD,NGOs,CBO,	350,000	
SWM4	To Promote Waste Treatment								

#	Strategic Action	Specific objectives/ outputs	Activity Code	Activities	Output indicators	Timeframe (by When)	Responsible (by whom)	Budget in USD	Remarks
Dii-4-1	Waste treatment facilities and systems introduced and promoted.	To Promote Waste Treatment	Dii4-1.1	Promote waste treatment before disposal	No. of promotion campaigns	Immediate	LCC,MLGRD,EAD,DS&T	75,000	
			Dii4-1.2	Establish waste treatment facilities	No. of Waste Treatment plants established	Medium Term	LCC, MLGRD,EAD, DS&T	286,000	
SWM5	To Mobilise Resources for SWM Services								
Dii-5-1	Mobilise US$ 3.5 Million resources from local sources	To Mobilise Resources for SWM Services	Dii-5-1.1	Waste Collection Fees to be included in the Rates billing system but should be channelled directly to the Waste management activities	System of collection in place and instruments in place	Medium Term	LCC,MLGRD,LWB,ESCOM	200,000	
			Dii-5-1.2	Private Operator gets a Waste Management operation License from the LCC who pays for this License to the LCC in the process	No of Licenses awarded	Medium Term	LCC,MLGRD,LWB,ESCOM		
			Dii-5-1.3	The Waste Management Services Fees could also be paid either the Water Bills (LWB) or Electricity Bills (ESCOM)	System of fee collection in Place	Medium Term	LCC,MLGRD,LWB,ESCOM		
			Dii-5-1.4	The LCC should start collecting Waste Dumping fees at the gate of the Landfill site	Weighbridge in place at the gate to Landfill site	Long Term	LCC,MLGRD,LWB,ESCOM		
Dii-5-2	Mobilise US$ 1.5 Million resources from international sources		Dii-5-2.1	Galvanise efforts to raise funds from International Donor fraternity	Donors approached and resources obtained	Medium and Long-term	LCC , MLGRD,MFA	500,000	
SWM6	Drive 6: To Instil Culture Of Responsibility Towards SWM to the Public								
Dii-6-1	Capacity building and Education and awareness promotion	To Instil Culture Of Responsibility Towards SWM to the Public	Dii-6-1.1	Sensitize the public on responsible waste management	No. Of campaigns	Immediate and Long Term	LCC, EADDED	357,143	
			Dii-6-1.2	Educate the public on integrated waste management	No of people trained	Immediate and Long Term	LCC, EADDED	214,287	
Total Solid Waste Management								**34,145,430**	
GRAND TOTAL								**306,095,030**	**including taxes and contigencies**

7 REFERENCES

- LWSP – 2021a: Assessment of the Existing Situation. Volume 2: Annexes – Detailed Assessment - Authored by Engidro et al,
- LWSP, 2021b: Development of Sanitation Business Plan for Lilongwe City, Draft Business Plan – Aithoured by WSUP Advisory
- LWSP, 2021c: Onsite Sanitation Systems (OSS) Feasibility Study Report, - Authored y SWS / L.Gravan / Infracon Joint Venture.
- World Bank, 2017:. Lilongwe Water and Sanitation Project – Project Appraisal Document.

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