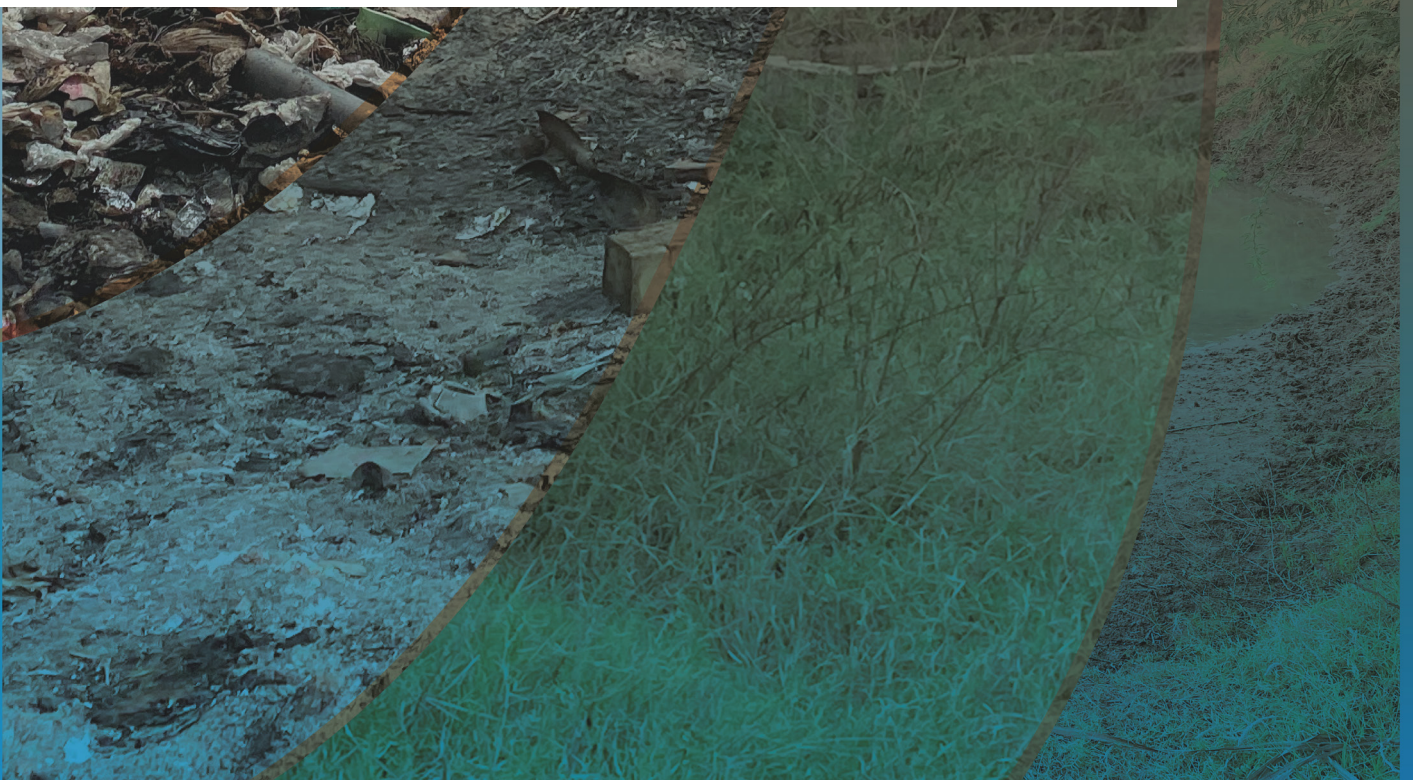




TOWARDS A CLEANER AND MORE PRODUCTIVE MALINDI AND WATAMU

A City-Wide Inclusive Sanitation and
Municipal Solid Waste Plan



Commissioners



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Acronyms

CWIS	City-wide Inclusive Sanitation	NPV	Net Present Value
FSM	Fecal Sludge Management	SOP	Standard Operating Procedure
MAWASCO	Malindi Water and Sewerage Company	WSP	Water Service Provider
NEMA	National Environmental Management Authority	WASREB	Water and Sanitation Regulatory Board

Foreword

The Kilifi County Government aspiration is to have a clean, healthy, and productive county. In addition, everyone should enjoy the basic right to sanitation and waste management. This should be achieved through an approach that is inclusive of all residents and delivers safe management across the entire value chain. These aspirations can be realized through efficiently managed local government bodies, including Water Services Providers and Municipal Boards.

Within Malindi Water and Sewerage Company (MAWASCO) and Malindi Municipal Board's area of jurisdiction, there is no waste treatment plant and only 25% of waste is safely managed. As a result, over 90% of hand dug wells are being contaminated. There is need for concerted efforts to make the right investments in sanitation and waste management services. Environmental tourism is a driving force of Malindi's economy, and we cannot risk having waste polluting our environment. To continue being a preferred tourism destination, we should focus on the goals outlined in this plan:

Goal 1: Achieve equitable and financially sustainable access to safely managed sanitation for all

Goal 2: Ensure clarity in mandates and market Malindi as Kenya's cleanest coastal town

Goal 3: Create jobs and build local capacities to have a thriving sanitation economy

Achieving these goals requires collaboration and coordination. As a primary shareholder, I am committed to urging the government to follow these strategies. We will meet regularly to check in on our progress. My department will extend the necessary support, ranging from resource mobilization for infrastructure investment to allowing MAWASCO and the Municipal Board to operate at arm's length. My department will also provide an enabling environment for public private collaboration.

Lastly, I would like to acknowledge and appreciate the support extended to MAWASCO and the Municipal Board by H.E. Hon. Amason Kingi, Governor, Kilifi County.



Hon. Mwachitu Karisa Kiringi

Executive Committee Member:

Water, Forestry, Environment and Natural Resources

Purpose

This is an executive summary of a full city-wide inclusive sanitation plan. The full plan along with detailed action and investment plan is available upon request and can be used as an example for other utilities to follow.



Multisector stakeholder committee at kick-off meeting for city-wide inclusive sanitation plan in Malindi.

Introduction

A Vision of Change

Leaders in Kilifi County government and Malindi Water and Sewerage Company (MAWASCO) recognized an urgent need to improve the sanitation and solid waste challenges in their community. They envisioned steering a process to gather information on existing services and gaps, coordinate multisector stakeholders, and identify and prioritize solution. This report shares the vision for city-wide inclusive sanitation (CWIS) and the developed action and investment plans.

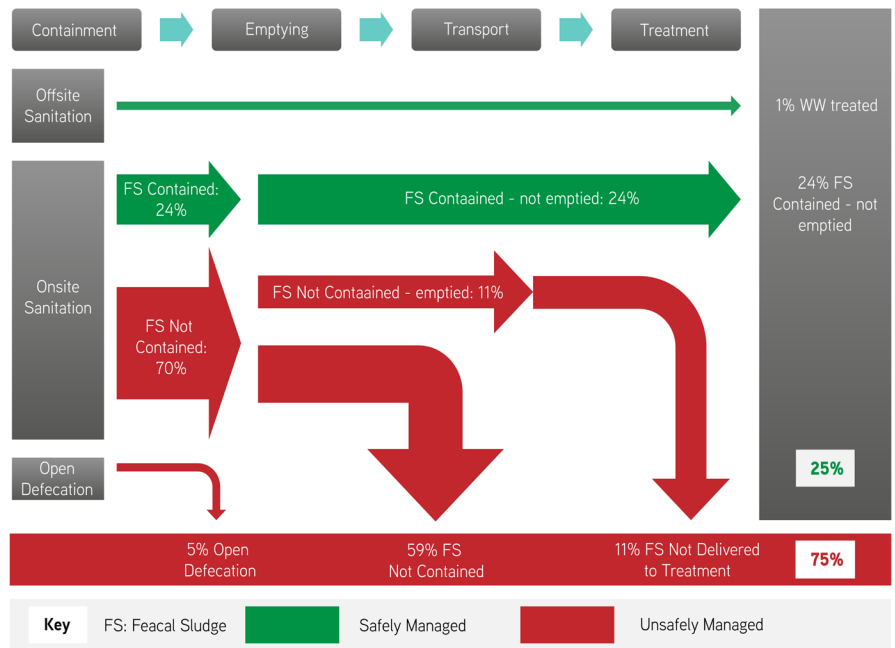


Figure 1 The Malindi Shit Flow Diagram (SFD) visualizes flows of waste that are safely and unsafely managed.

The urgent need for improved sanitation and solid waste

Malindi and Watamu, known for their beautiful beaches and vibrant communities, are experiencing rapid urbanization; the population is expected to nearly double by 2040 (KPHC 2019). The current population of 311,646 residents has no sewerage coverage and no waste treatment options, resulting in only a quarter of human waste as “safely managed” (Figure 1). As for solid waste, 42% of the households dispose of their waste by burning it. In addition, a clear service delivery framework and standard operating

procedures (SOPs) for waste management is lacking. This leads to environmental contamination; thus, threatening marine life.

Overall, poor sanitation has greatly impacted tourism, livelihood, local health, and the economy. Malindi was once rated the cleanest town in Kenya by UN-HABITAT but has since lost the glory. The current sanitation situation in Malindi is depicted in Figure 2.

Struggling to reach all residents with safely managed sanitation.

Like many towns in Kenya, nearly all of the population is served by on-site sanitation, including 40%

septic tanks, 9% lined tanks with open bottoms, 40% direct pit latrines and 5% Open defecation (Figure 3). Over 90% of the hand dug wells tested positive for fecal contamination. Currently, all the collected sludge is dumped at an unregulated municipal dump site or illegally disposed of in agricultural fields, open grounds, rivers and storm water drains. A wastewater master plan, commissioned by the World Bank in 2017, proposed an extensive sewer network to increase access to safely managed sanitation in the towns of Malindi and Watamu. However, this

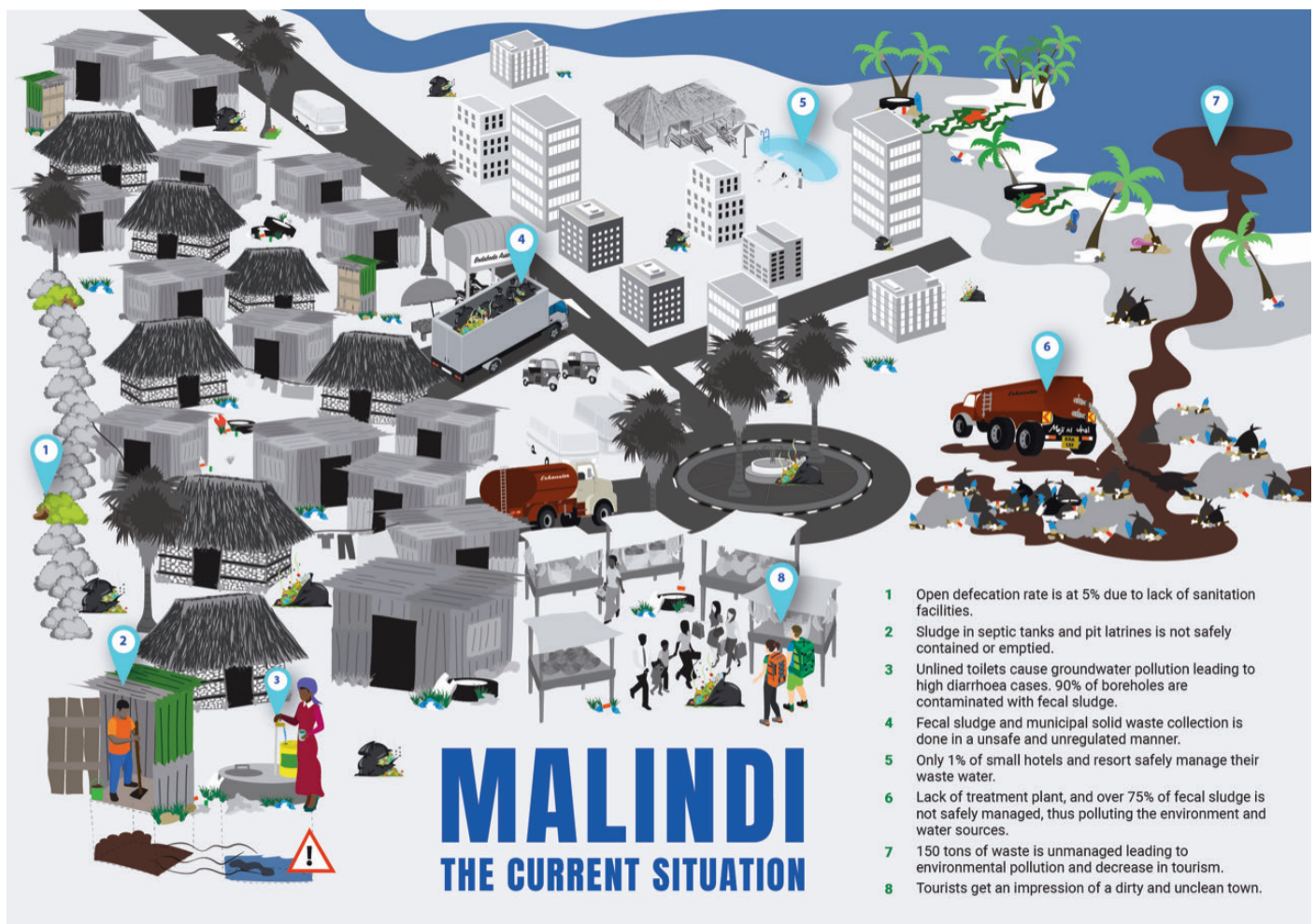


Figure 2 Graphical representation of the current environmental situation in Malindi.

proposed solution is designed to serve only 35% of the population, addressing primarily high- and medium-income areas.

The amount of waste is only increasing.

As rapid urbanization continues, the amount of waste – both fecal sludge and solid waste - being generated and emptied is expected to grow exponentially (Table 1). City-wide inclusive solutions are needed to meet the other 65% of residents.

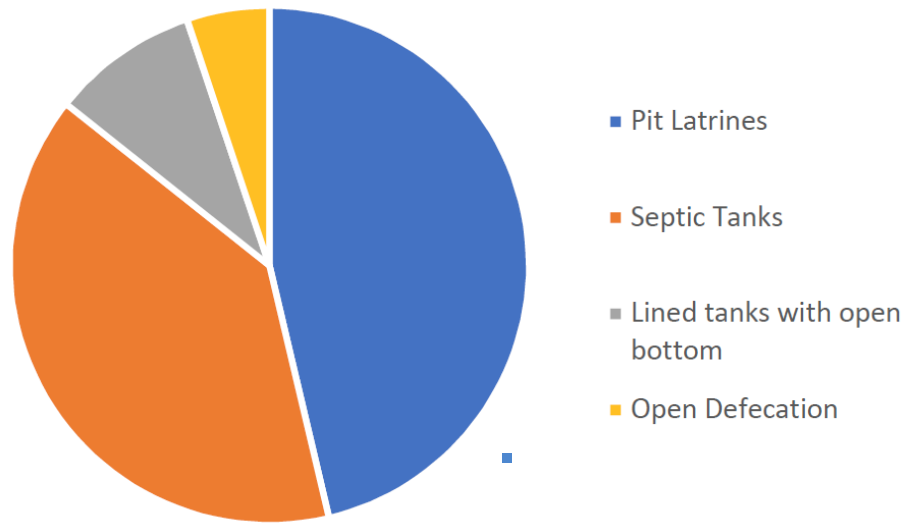


Figure 3 Containment types in the planning area

A shift to business as unusual
 “Citywide Inclusive Sanitation (CWIS) looks to shift the urban sanitation paradigm, aiming to ensure everyone has access to safely managed sanitation by promoting a range of solutions—both onsite and sewerred, centralized or decentralized—tailored to the realities of the world’s burgeoning cities.”
 - Martin Gambrell, Lead Water and Sanitation Specialist, World Bank

City-wide inclusive solutions could reach 4x more residents.

The public subsidy required to provide sewerage is \$155 per person per year. However, the required public subsidy for fecal sludge management is \$35 per person per year (AQUAYA & WSUP, 2019). Therefore, the county could reach four times as many residents with a city-wide inclusive sanitation approach.

Opportunity to shift to city-wide inclusive sanitation to reach all residents.

The county embraced a strategy that reached all residents and ensured everyone benefited from the positive impacts of safely managed sanitation. Malindi stakeholders saw this as an opportunity to get sanitation and solid waste right from the onset.

Year	2019	2025	2030	2035	2040
Population	201,423	258,580	321,061	3986,66	495,060
Sludge generated per day (m3)	370	466	568	693	745
Solid waste generated per day (in tons)	78	98	122	151	188

Table 1 Increasing volumes of sludge and solid waste in Malindi and Watamu towns.

Goals For the Vision

Identified key challenges guided the development of CWISP goals.

Before creating goals for the vision, the Malindi CWISP committee identified a number of key challenges for sanitation and solid waste were identified (Table 2). To address the key challenges and achieve their vision, the Malindi CWISP committee then developed three goals with targets.

Key Challenges	
Sanitation	Solid Waste
Existing wastewater master plan only covers 35% of population	No clear service delivery framework and SOPs for waste management for both Malindi and Watamu
Lack of ownership and plan for fecal sludge management	Existing waste transit points are overflowing, with waste coming from different sources and irregularly serviced.
75% of waste is not safely managed, impacting Malindi's environment and economy	42% of households dispose waste by burning, largely because most are low-income earners and cannot afford collection services.
No standard operating procedures and regulations across the sanitation value chain	Lack of strategies and plans around waste recycling for the private sector to engage or invest in.
47% of households have income below 10,000 KES/month, and unable to afford full cost of adequate sanitation facilities and services	Lack of clear land ownership of the waste disposal site and the land is increasingly being encroached on by private developers.
Existing capacity and corresponding financing resources for professional fecal sludge management service delivery is low	Pending approval and enactment of regulatory tariffs for waste collections.

Table 2 Key challenges identified by Malindi CWISP committee for sanitation and solid waste.

Area	Metric	Current	2025	2030	2040
Sanitation	% of population with improved sanitation	30%	50	75%	100%
	% of fecal sludge that is safely emptied and transported	11%	30%	60%	>80%
	% of waste safely treated	1%	30%	70%	100%
	% of MAWASCO Sanitation O&M costs covered	N/A	15%	85%	110%
Solid Waste	% of households with source separation	21%	35	50	60
	% of waste collection coverage	30%	55%	70%	85%

Table 3 Key metrics and targets to achieve equitable and financial access to safely managed sanitation

Goal One

Achieve equitable and financially sustainable access to safely managed sanitation for all

Equal access to equitable sanitation can mean the difference between prosperity and poverty, wellbeing and ill-health, and even living and dying (United Nations, 2018). However, large financial investments are required to provide access, whether through tariffs, taxes or transfers, including a properly structured service delivery model. The aim of this goal is to overcome sanitation inequalities and ensure that investments in sanitation bring social and environmental benefits. Table 3 gives a summary of key metrics and targets to achieve Goal 1.

Goal Two

Ensure clarity in mandates and help to market Malindi as the Kenya's cleanest coastal town

Having a clear institutional framework allows for accountability in responsibility and delivering services across the sanitation and solid waste value chain. Sanitation and solid waste are areas that require public involvement and behavior change. In addition to having clear mandates, developing a clear brand and marketing messages will help drive behavior change of all residents. Table 4 provides a summary of what the committee envisages to be accomplished by 2040.

Goal Three

Create jobs and build local capacities to establish a thriving sanitation economy

An appropriate enabling environment and institutional framework conditions are required to attract the private sector into the sanitation sphere. These framework conditions ideally require clear regulations, well-defined standard operating procedures, clearly outlined tendering and contracting arrangements, licensing mechanisms, and access to commercial financing. For sanitation, respective stakeholders will be measuring the increase in jobs created and if loans can be accessed by sanitation enterprises. Currently, there are ~50 jobs in the sector. Through improved enabling environment, over 700 jobs will be created by 2040 and private sector players will be able to secure loans for service delivery. In addition, for solid waste, the county has a target to increase budget allocation from \$36,000 per year to over \$180,000 by 2040.

Area	Metric	Current	2025	2030	2040
Sanitation and Solid Waste	Clarity in mandate & regulations	Legislation processes ongoing	Clear coordination mechanisms	Improved enforcement	Next 20-year plan created
	Marketing Malindi as the cleanest coastal town	Monthly clean ups	Branding and marketing established	Award recognition	Tourism Increase

Table 4 Summary of metrics and targets for ensuring clarity among stakeholders.

Solutions

Inclusive and Sustainable

Based on clear goals with concrete metrics, the committee developed detailed solutions and action plans. Below is summary of the solutions proposed.

Integrated and phased approach to achieve safely managed sanitation

The committee proposed a phased approach for sanitation, excreta and wastewater management (Figure 4). It includes four types of sanitation systems to address the income and density differences of the planning area. Each approach was selected to fit the specific demands of target population and geographic locations. These approaches include a variety of technologies and programs but are not limited to: household toilet improvement program, communal ablation blocks, pit emptiers association, transfer stations, performance-based contracts, waste-to-value treatment plants, and sewers. Together, these phased approaches are integrated to achieve citywide inclusive sanitation in the planning area.

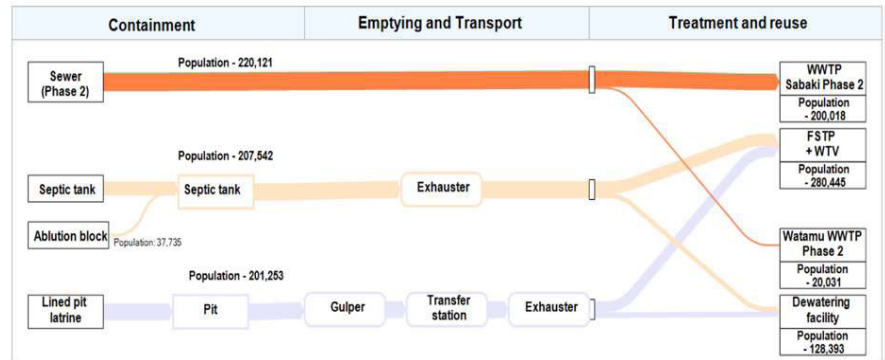


Figure 4 Proposed solutions to achieve safely managed sanitation for all.

Revenue Mechanism (and Responsible Entity)	Approximate	Payer	Cost Covered
Sanitation Surcharge on 100% of water customers (MAWASCO)	10-50% of water	All water customers (enabling pro-poor and climate resilient skew)	<ul style="list-style-type: none"> • 50% of emptying costs (other 50% borne by households) • Fecal sludge treatment • Utility administration
Sewerage Tariff on 35% of households (MAWASCO)	75% of water bill	Sewerage customers	<ul style="list-style-type: none"> • Sewer network • Wastewater treatment • Utility administration

Table 5 Sanitation surcharge and tariff to cover emptying costs, treatment, and maintenance of sewer network.

This integrated approach is aligned with the Water and Sanitation Regulatory Board’s (WASREB) recommendations in their 2020 impact report.

New sanitation revenue mechanisms to drive sustainability

To generate revenue to cover some of the urban sanitation costs, MAWASCO is exploring an approach to include a sanitation surcharge

“The sector should explore other low-cost options and the adoption of Citywide Inclusive Sanitation (CWIS) approach that combines regulation of both sewerred and non-sewerred sanitation service provision”

– WASREB Impact Report 2020

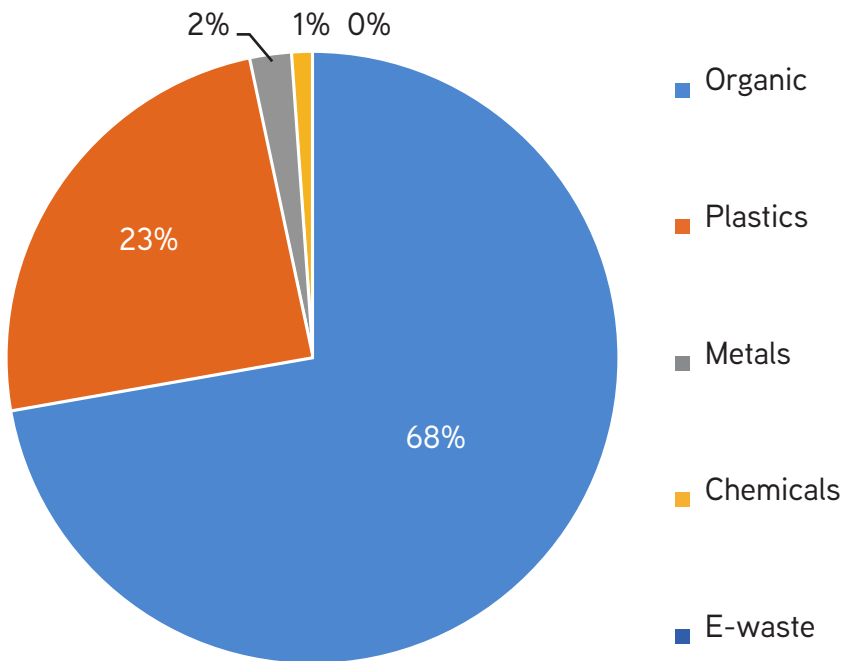


Figure 7 Different type of waste streams in Malindi

“Water service providers (WSPs) that offer or facilitate the development of on-site sanitation services will be eligible for a special sanitation surcharge reflecting real costs that can be added to the tariff.”
 -WASREB Impact Report 2020

within water utility bills, a concept that has been recently embraced and encouraged by WASREB.

This is an innovative model that other water utilities can employ to manage and scale up sanitation services in Kenya and elsewhere.

The sanitation surcharge would subsidize emptying costs and cover fecal sludge treatment, whereas the sewerage tariff can cover operations and maintenance costs for sewers (Table 5). A full business plan is available on request.

Formalizing solid waste management to scale sustainable services

In regard to solid waste management in Malindi, there are some ongoing initiatives, including a waste recycling community center (Figure 5), the promotion of source separation through the provision of



Figure 5 Waste recycling in Watamu community center

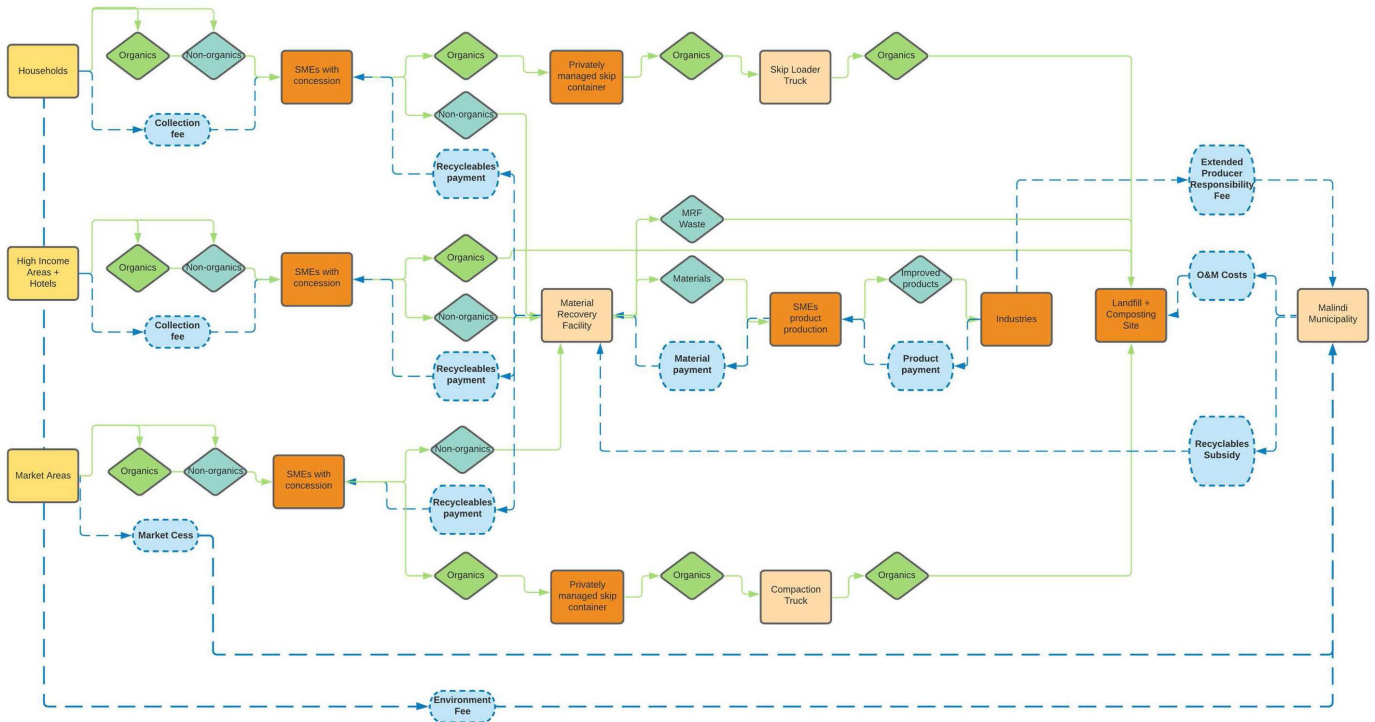


Figure 6 Proposed municipal solid waste business model to ensure sustainability

initial waste bins, and collaborative monthly clean-ups led by Malindi Green and Blue. These initiatives bring together key stakeholders and institutions. Malindi Municipality plans to continue take lead on these initiatives and to have a comprehensive solid waste management system to achieve

equitable and sustainable waste management services (Figure 6). In addition, the committee identified a variety of waste streams in Malindi and Watamu towns (Figure 7). The key to the plan is having a business

model that incentives separate processing for separate waste streams and formalizes many of the existing activities through the following principles and business model:

Extended Producers Responsibility
 This is a gazetted law where large plastic manufacturers have to ensure that waste is disposed of safely, including bearing the financial costs. By organizing the waste collection, Malindi Municipality can apply for revenue from the Extended Producers Responsibility.

- 1 Change behavior of residents to enable source separation
- 2 Partner with existing waste collectors and establish clear concession zones
- 3 Promote source separation of waste to enable value addition and recycling
- 4 Introduce financial sustainability mechanisms, such as an environmental fee, extended producers' responsibility, performance contracts, and payment for recyclables.

Governance

Mandates and Collaboration are Critical

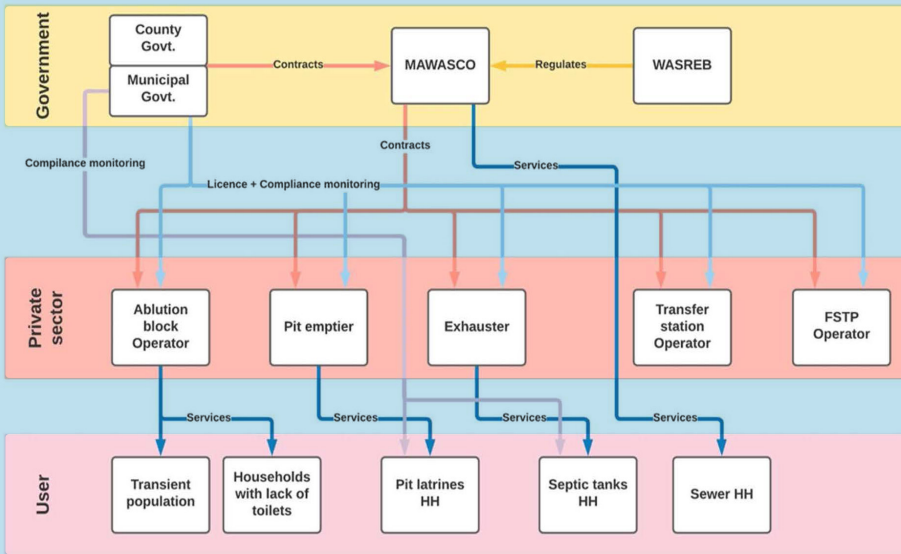


Figure 8 Proposed institutional framework for sanitation

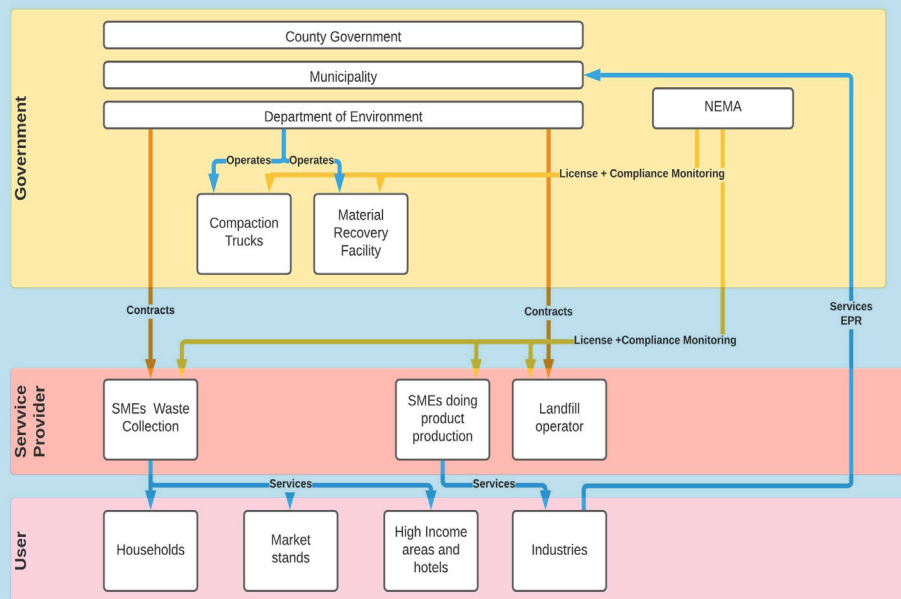


Figure 9 Proposed institutional framework for solid waste

For the plan to succeed, mandates and institutional frameworks are critical. They provide direction and ownership to allow services to be appropriately delivered. Overall, the proposed mandates in this plan follow many of the bills, acts, and strategies already developed in Malindi. (Figures 8 & 9). They present are clear responsibility how the government, service providers, and private sector work together to deliver improved services to local residents.

Investment Plan

A Blended Finance Approach

Achieving the three goals requires both capital and operational investment to ensure that more than 80% waste is safely managed. The total financing required to achieve the strategy is \$115 million - \$94M for sanitation and \$21M for solid waste.

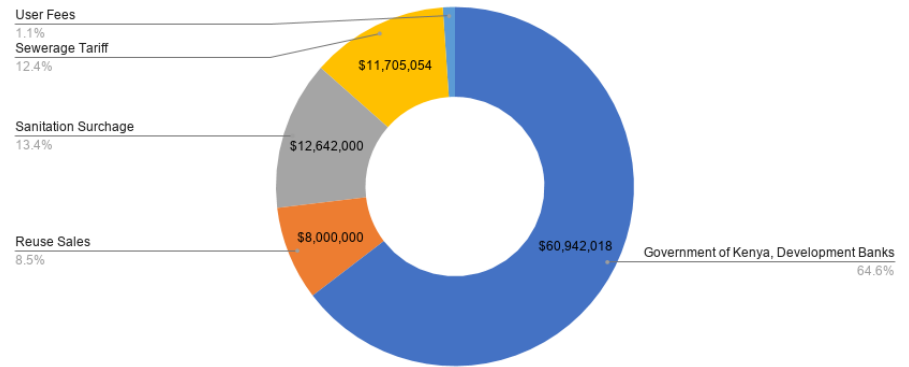


Figure 10 Total estimated costs broken down by source of funds.

Short-term Interventions (2020-2025)		Medium-term Interventions (2025-2030)	Long-term Interventions (2030-2040)
Branding MAWASCO to sanitation and implementation of FSM function Construction of ablution blocks, transfer stations, and implementation and operationalization of fecal sludge treatment plants >185m ³ /day Set up an essential legal and financial framework that enables a safely managed fecal sludge collection and treatment/reuse system Create a program that provides financial incentives and promotes the installation and operation of improved on-site sanitation Develop and finance an institutional capacity development program for the municipality of Malindi and its utility		Monitoring and enforcement that all households have improved sanitation facilities and set emptying SOPs Monitoring of performance of delegated performance management contracts for FSM Regularly collect tariff and show clients value for money on improved service delivery Review sanitation tariff and integrate with sewerage tariff Secure funding for and implement sewer networks and wastewater treatment plants in central business districts Implement and sustain a public relationship campaign to market MAWASCO as a champion for sanitation	Monitoring and enforcement that all households have improved sanitation facilities and compliance of set standards/regulation across the value chain Monitoring of performance of delegated performance management contracts for FSM Monitor implementation and performance of FSTP, sewer networks and wastewater treatment plants Celebrate accomplishments and track learnings from short-term and medium-term action plans. Use learnings to develop sanitation
Total Cost (USD)	11,829,996	42,918,939	39,562,158

Table 6 Proposed sanitation interventions and projected costs to implement.

Short-term Interventions (2020-2025)		Medium-term Interventions (2025-2030)	Long-term Interventions (2030-2040)
<p>To provide and/or review requisite policies and legislation to regulate and promote public participation to ensure responsive and inclusive waste management services in Malindi</p> <p>Provide and ensure waste equipment meet National Environmental Management Authority (NEMA) requirements</p> <p>To promote circular economy in waste management services delivery in Malindi by promoting PPP based businesses in waste collection and recycling</p> <p>Enhance capacities of enforcement units for compliance monitoring</p> <p>Establish waste audit and database system</p> <p>Initiate, implement, and sustain an awareness raising campaign and public relations for municipal solid waste</p>		<p>To improve staff capacity in Malindi Municipality to enable sustainable delivery of integrated waste management services</p> <p>Establish a new sanitary landfill for Malindi Municipality in line with NEMA standards</p> <p>Establish a waste industrial park at Mayungu to promote small and medium sized waste recycling enterprises</p> <p>Improve waste database and awareness creation on waste management</p>	<p>Improve capacity through provision of refresher courses</p> <p>Maintenance of all waste equipment to NEMA standards</p> <p>Continuous database improvement and awareness creation on waste management practices</p>
Total Cost (USD)	12,115,000	4,090,000	4,330,000

Table 7 Proposed solid waste interventions and projected costs to implement.

Key sanitation interventions and required investment

For the \$94M sanitation investment plan, the public investment from the Government of Kenya and development banks is \$61M, while the remaining \$33M is a blend of payments from residents (in the form of payments for improving household toilets, sanitation surcharge, and sewerage tariff) and sale from reuse products (Figure 10). The revenue from sale of reuse product only occurs with a waste-

to value model; without a waste-to-value approach, the utility would bear the operational risk and costs of the fecal sludge treatment plant. The investment plan generates \$10M net present value (NPV) from the benefits of safely managed sanitation alone. The total financing is broken down by ~\$12M in the short-term (2020-2025), ~\$43M in the medium-term (2025-2030), and ~\$39M in the long-term (2030-2040) (Table 6).

Key solid waste interventions and respective investment

To implement the proposed interventions for solid waste, a total of ~\$21M investment is required to achieve the three goals and get Malindi municipality to a clean, healthy and sustainable city with zero waste (Table 7).

Conclusion

Vision, Commitment, and Plans for a Clean and Thriving Malindi

The CWIS for Malindi & Watamu is an important starting point to bring attention towards the 'important yet often neglected area' of sanitation and solid waste and it presents a comprehensive snapshot of the issues and progressive way forward to tackle them. After implementing the strategy, the future Malindi will be a clean and thriving coastal town in Kenya (Figure 11). The municipality and MAWASCO are using this

document as a blueprint for working together with other departments and county government in initiating detailed feasibility studies, designs, and development of tender documents to implement the recommended steps. A stakeholders committee comprising all local stakeholders involved in the development of this plan and public representatives will be formed to steer the implementation of actions in the near future.

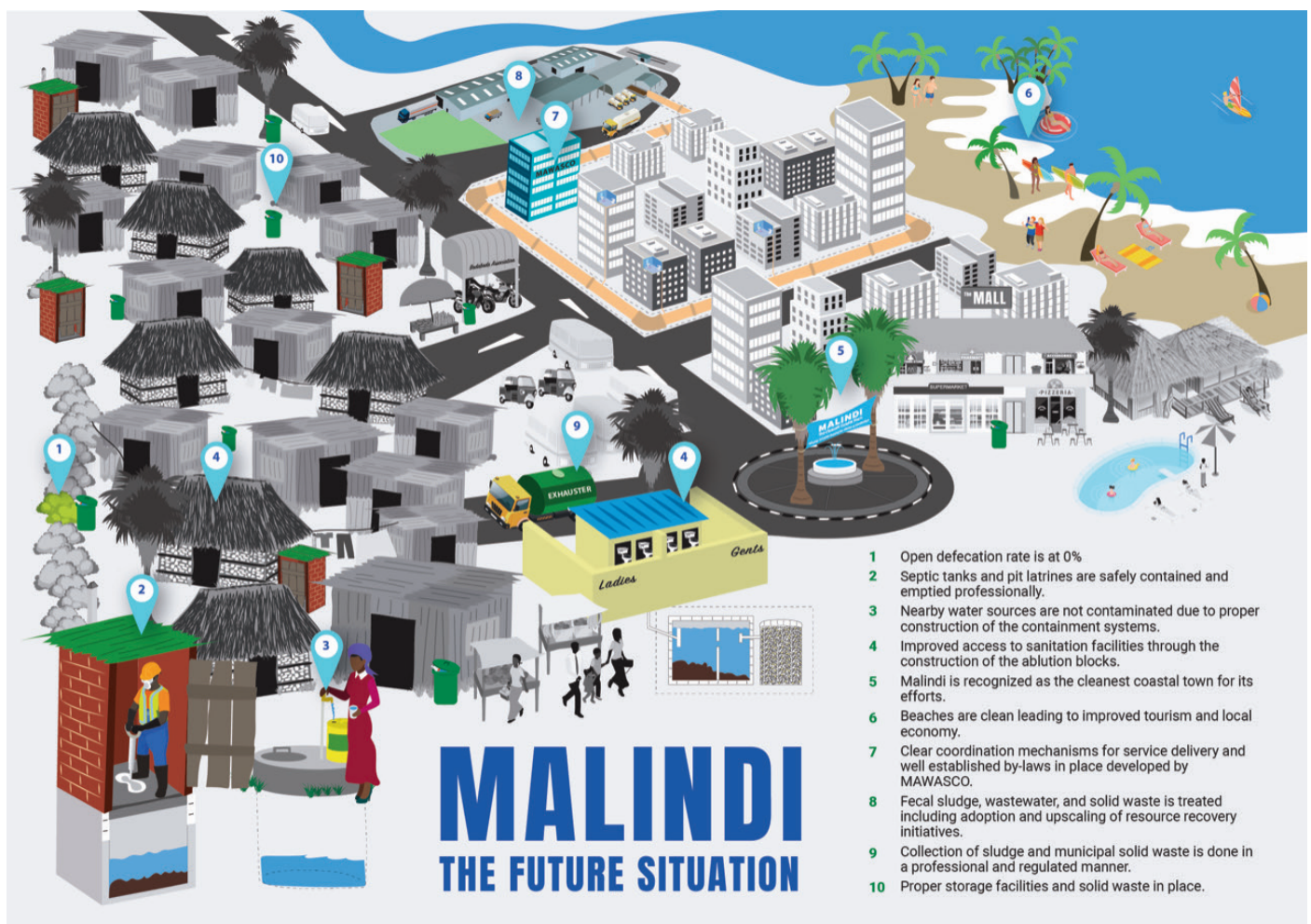


Figure 11 A clean and thriving Malindi after implementing city-wide inclusive sanitation plan.

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Let us keep the joint effort going to achieve the Malindi City wide inclusive sanitation and solid waste plan

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