

Citywide Inclusive Sanitation In Practice: Experience From Malindi, Kenya

Citywide Inclusive Sanitation (CWIS) aims to ensure that all urban residents have access to a decent toilet and that all fecal waste is safely managed, from capture to disposal or reuse.

For many African cities, this is an ambitious vision that will take years to achieve, unless there is a fundamental shift in the delivery of sanitation services. This shift is already happening in Kenya, where greater than two thirds of the population do not have access to safe sanitation services. Counties and cities are starting to adopt county- and citywide inclusive sanitation in their quest to achieve universal coverage for their residents. Malindi is leading the way in adopting CWIS principles, demonstrating a pathway for other cities and towns to follow. This Practice Note outlines how Malindi stakeholders are collaborating to deliver a long-term plan for improving sanitation services and making CWIS a reality.



Image: Aerial view of Malindi

Malindi is leading the way in adopting CWIS principles, demonstrating a pathway for other cities and towns to follow. This Practice Note outlines how Malindi stakeholders are collaborating to deliver a long-term plan for improving sanitation services and making CWIS a reality.

Sanitation status in Malindi

Malindi town is a popular tourist destination on Kenya's coast, known for its beautiful sandy beaches. Once rated one of the cleanest towns in Kenya by UN-HABITAT, sanitation in Malindi has become an enormous issue. Over three-quarters of the town's 310,000 population have no access to safely managed sanitation,¹ with residents forced to rely on unsafe containment and emptying services. Currently, all collected sludge is dumped at an unregulated municipal dumpsite or illegally disposed of in fields, open grounds and drains. As a result, 90% of hand-dug wells in Malindi are contaminated with fecal waste, causing severe health risks to the residents relying on groundwater sources.²

The lack of proper waste management in Malindi is also causing environmental damage, threatening the fragile marine ecosystem that forms the backbone of the town's economy. Climate change is projected to exacerbate these issues with ocean-level rise and flooding, while poorly managed sanitation can also account for large proportions of a city's total greenhouse gas (GHG) emissions.³ Like other urban areas in Kenya, the sanitation challenge is set to increase because of rapid urban population growth, which is expected to double in Malindi by 2040.⁴ As a result, the amount of waste to be managed by the city is forecast to grow exponentially. This requires city and county authorities to devise a plan to tackle the sanitation problems not just of today but for years to come.

Developing the CWIS Plan: A Multi-Stakeholder Process

Recognizing the urgency of the situation, key stakeholders collaborated in developing a long-term plan for Malindi and Watamu (another touristic neighbouring town with a population of 100,000) to ensure that all residents can access safely managed sanitation services. Institutional leadership was provided by the County Government of Kilifi, the Municipal Board of Malindi and Watamu, and Malindi Water & Sewerage Company (MAWASCO), the utility responsible for delivering water and sanitation services in Malindi. Lead technical partners were Sanivation and Water and Sanitation for the Urban Poor (WSUP). The World Bank provided support through analytical work on market-based models for non-sewered sanitation, as well as sanitation investments through the World Bank-financed Water and Sanitation Development Project. Local key stakeholders included residents associations, hoteliers, the business community and environmentalists.

1 Akinyi, E, Foote, A, Bohnert, K, Oyamo, P, Oluoch, P (2019) Towards a Cleaner and More Productive Malindi and Watamu: A City-Wide Inclusive Sanitation and Municipal Solid Waste Plan.

2 Akinyi et al (2019).

3 Johnson, J, et al (2022) Whole-system analysis reveals high greenhouse-gas emissions from citywide sanitation in Kampala, Uganda. *Commun Earth Environ* 3, 80 (2022).

4 KNBS (2019) Kenya Population and Housing Census.



Formation of CWIS Planning Committee

The process began with MAWASCO and local government recognizing the problem, their mandate to deliver sanitation services, and requesting partners for support. The utility brought on one of the lead technical partners, Sanivation, to develop a clear and achievable City-Wide Inclusive Sanitation Plan.

Partners then formed a CWIS Planning Committee to develop goals to guide the long-term sanitation vision and plans for Malindi and Watamu. In addition to the lead local institutions and local key stakeholders, the Committee featured representatives from Kenya's Ministry of Health, Lands, Water & Environment and the National Environment Management Authority (NEMA). The Committee reviewed the sanitation situation in Malindi and identified key challenges that needed to be addressed, including lack of a long-term plan for citywide fecal sludge management; absence of sanitation infrastructure and formal service provision arrangements; absence of regulations and standards to structure services; inability of households in low-income areas to afford the full cost of safe sanitation services; and limited service provider capacity and financial resources for managing sanitation services.

Drafting of the CWIS Plan

The drafting process began with MAWASCO organizing stakeholder consultations. A detailed assessment of fecal sludge management practices and systems in Malindi and Watamu was then carried out. The assessment found that access to improved sanitation in Malindi is low, with approximately 5%⁵ of residents practising open defecation. Over 75%⁶ of fecal waste is not safely managed, heavily impacting the town's fragile ecosystem and economy. Over half of households in low-income neighbourhoods (55%⁷) share a toilet.

Figure 1: Key stages in development of the Malindi CWIS Plan.



Building on these assessments and the situation review, the CWIS Committee developed the CWIS plan facilitated by a consultative process. In summary, the resulting Plan has three complementary goals:

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

⁵ WSUP & EAWAG (2019) Malindi SFD Report.

⁶ Ibid.

⁷ WSUP & Aquaya Institute (2019) Sanitation, Policies, Practices & Preferences in Malindi, Kenya.



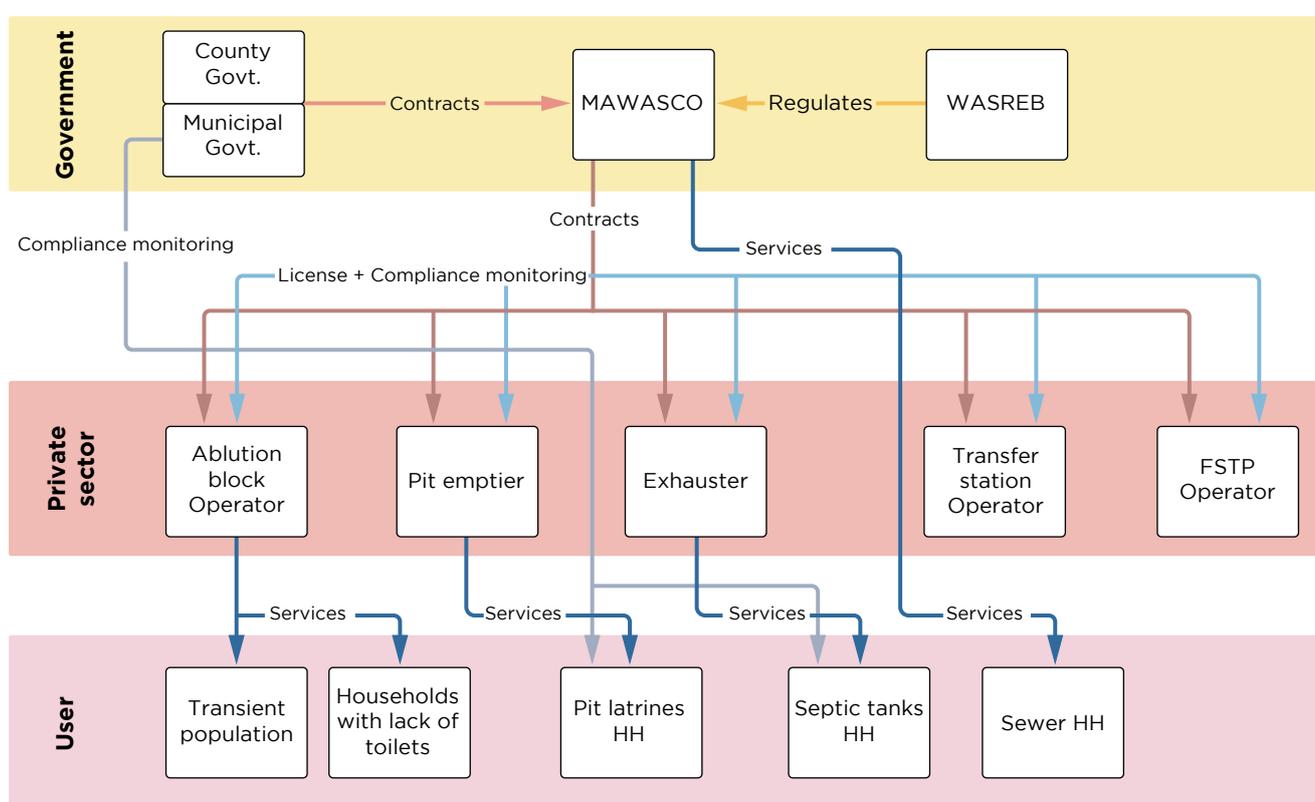
Key Elements of the CWIS Plan

1: Stakeholder Collaboration Underpinned By Clear Responsibilities

For any CWIS plan to succeed, clear mandates and institutional frameworks are critical. They provide direction and ownership to allow services to be appropriately delivered. Figure 2 presents the institutional framework outlined in the Plan. The framework clearly places overall responsibility for coordinating services with MAWASCO and illustrates how the government, service providers, and the private sector will work together to deliver improved services to residents.

The CWIS planning area boundaries are based on the service areas mandated to MAWASCO. The utility has an urban service coverage area of 449 km², including Malindi, Watamu, and three additional locations—Ganda, Gede and Magarini—and serves 312,000 people.

Figure 2: The proposed institutional framework for sanitation in Malindi. MAWASCO is responsible for sewered sanitation, which it provides directly, and non-sewered sanitation, to be delivered through contracts with the private sector. The graphic shows multiple contracts with private sector entities - an option with one private sector intermediary is also being evaluated. Malindi Municipal Government is responsible for license and compliance monitoring. The national water and sanitation regulator, WASREB, provides the regulatory and compliance framework for the utility. Source: Akinyi et al, 2020.



2: Defining Options to Address the Full Sanitation Service Delivery Chain

CWIS requires a blend of sanitation options tailored to the specific needs of geographic locations and target populations. The CWISP committee proposed a range of sewered and non-sewered services and supporting infrastructure for inclusion in the Plan, structured to address the full-service delivery chain, summarised below.

- **Containment:** Development of a household toilet improvement program at both household and communal levels.
- **Emptying and conveyance:** Formalization of pit-emptying services and support of Formal Pit Emptiers (FPEs) by the utility; introduction of performance-based contracts to strengthen emptying services; provision of fecal sludge transfer stations; sewer construction in some areas.

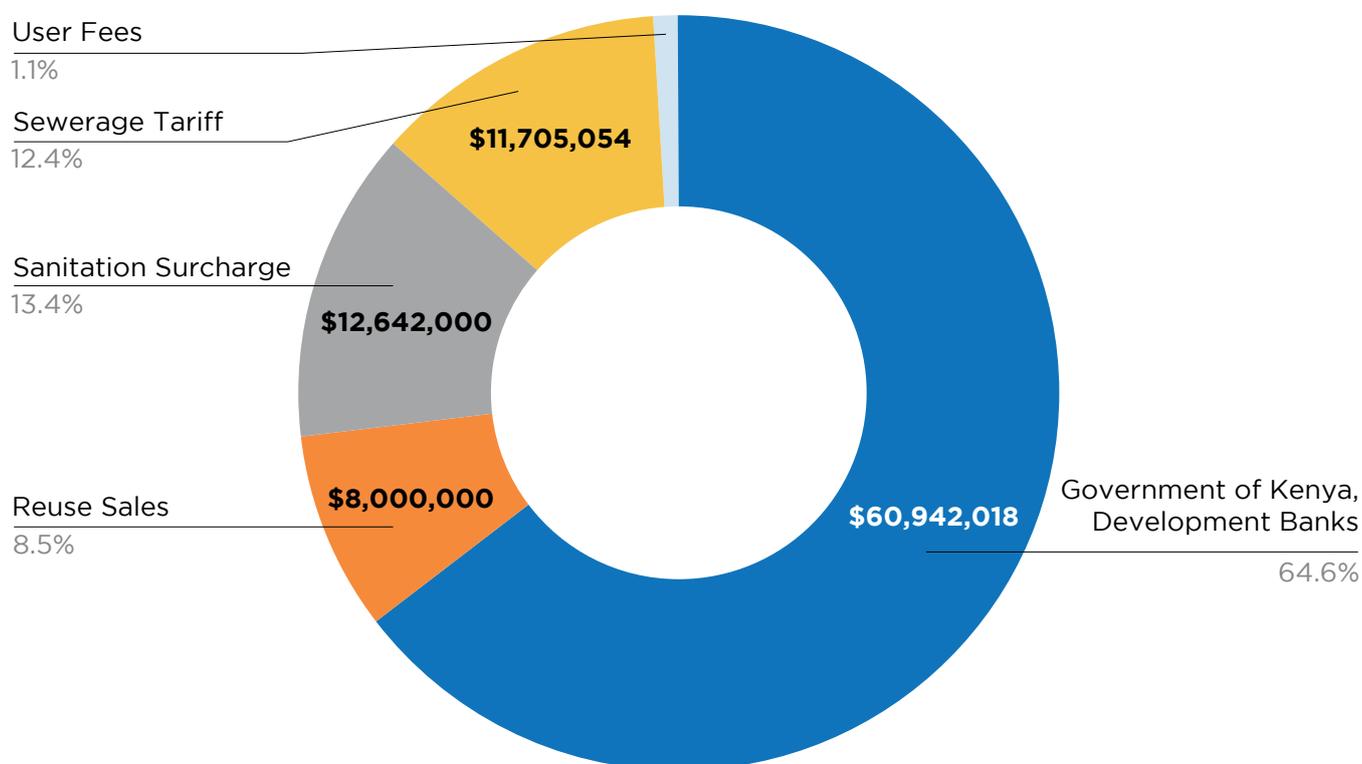
- **Treatment:** Construction of fecal sludge treatment plants (FSTPs) in Malindi (capacity 93m³ per day) and in Watamu (capacity 25m³ per day), supplemented by improved sewer services in the medium to long term.
- **Disposal / Re-use:** Construction of a waste-to-value (W2V) facility within Malindi FSTP, projected to produce 47 tons of biofuels daily in the medium term.

These approaches will need to be costed, financed and implemented in a phased approach to move Malindi and Watamu from a purely informal to a fully-functional sanitation market.

3: A Blended Finance Approach

A detailed investment costing for the CWIS plan has been developed to underpin sanitation improvements in Malindi. The total financing required to deliver sanitation improvements under the Plan is US\$ 94M. To generate revenue to cover some of the urban sanitation costs, MAWASCO proposes introducing a sanitation surcharge within water utility bills – a concept being championed by WASREB to bridge the sanitation cost gap in Kenyan utilities. It is envisaged that revenues from the surcharge will subsidize emptying and fecal sludge treatment costs, whereas the sewerage tariff can cover operations and maintenance costs for sewers. The Waste-to-value model, which includes revenue from sales of reuse product, is also an important feature of the Plan, helping to lower the net operational costs of running the fecal sludge treatment plant.

Figure 2: Total estimated costs to implement the CWIS Plan broken down by source of funds. Source: Akinyi et al, 2020.



4: Integrating Sanitation With Solid Waste Management

The CWIS Plan recognizes that excreta and wastewater management are closely connected with providing other basic services and urban development more broadly. This is reflected in the inclusion of solid waste management (SWM) in the Plan, with an estimated investment requirement of US\$ 21M. The CWIS plan references ongoing SWM initiatives, including behaviour change activities and the promotion of source separation through the provision of initial waste bins. Under the Plan, Malindi Municipality will continue to lead in developing a comprehensive solid waste management system to deliver equitable and sustainable SWM services. At the same time, the county has targeted an increase in the SWM budget from US\$ 36,000 per year to over US\$ 180,000 by 2040.



Implementing The CWIS Plan

Although at a formative stage, implementation of the CWIS plan is already gathering momentum. Many significant activities are underway, involving a wide range of partners. Together, these interventions represent a comprehensive response covering the full sanitation value chain. Key developments to date are outlined on the next page.

Full Sanitation Value Chain: Establishment Of A Sanitation Department Within MAWASCO

To successfully fulfil its mandate, MAWASCO has recently established a sanitation department through which sanitation services will be coordinated. The department currently includes a Manager, Sanitation Officers and Peri-Urban Coordinator. Core functions of the team continue to be defined and are expected to include coordination and oversight of fecal waste management services across the sanitation value chain, in collaboration with the County Government and the private sector, as well as the marketing of sanitation services and the adoption of a customer-centric approach to sanitation service provision.



Image: Formalized pit emptying service providers in Malindi

Emptying and Transport: Stimulating The Market For Pit Emptying Services

Led by MAWASCO and with the technical support of WSUP and Sanivation, coordinated activities are underway, initiated by the TRANSFORM utilities challenge, to develop the capacity of manual pit emptiers, promote behaviour change and stimulate the market for non-sewered services in Malindi. Key activities in this area include:

- Development of Standard Operating Procedures to raise standards, professionalize services and minimize public health risk throughout the emptying and disposal process;
- Ongoing assessments of the drivers for household sanitation investments and how manual pit emptiers in Malindi can better package their services to attract demand;
- Business modelling support identifying optimal public-private arrangements between MAWASCO and fecal waste emptying service providers.⁸



Image: Ongoing construction of fecal sludge treatment plant, Malindi.

Treatment and Reuse: Public Funding Allocation and Ongoing Construction of Waste-to-Value Treatment Plants

From the onset, one of the key challenges in Malindi was a lack of a waste treatment plant for the 300,000 people living in the catchment area. MAWASCO selected to pursue waste-to-value treatment plants because of the lower operational costs and environmental benefits. Through the World Bank financed Water and Sanitation Development Project and with the technical support from Sanivation, MAWASCO prepared detailed designs and tender documents for the Malindi and Watamu FSTPs as well as the Malindi waste-to-value facility. These plants will treat fecal sludge and combine it with other waste products, to make biomass briquettes that are sold to industries to replace firewood (pre-treated total solids from Watamu will be periodically transported to Malindi for treatment and resource recovery). The waste-to-value approach lowers operational costs for the utility to ensure operational sustainability and curbs deforestation. The project is also financing construction of these FSTPs and W2V plant which are expected to be completed in 2023. The World Bank's Public Private Infrastructure Advisory Facility (PPIAF) and the 2030 Water Resources Group (2030WRG) are providing technical advisory support to MAWASCO for structuring a PPP model for the operation of the FSTPs under a performance-based contract.

⁸ TRANSFORM (2022) Transform Utilities Sanitation Challenge: Learning Dissemination.



Strengthening of Enabling Institutional, Policy and Market Environment

To be successful, the CWIS Plan will require a supportive and structured environment for all market actors to freely and competitively participate in sanitation service delivery in Kilifi County. This will be ensured by finalizing the Draft Kilifi County Environmental Health & Sanitation Bill 2016 and Draft Malindi Standard Operating Procedures for Fecal Sludge Management 2021. Urban sanitation regulations and standards will also need to be drafted.

Monitoring Implementation of the CWIS Plan

Implementation of the CWIS plan will be supervised by a Committee which brings together expertise to support MAWASCO and the County Government in managing the process of developing sanitation infrastructure, stimulating the market and strengthening institutional systems. The Committee will meet quarterly to ensure the Plan continues to advance at the required speed and with the required level of coordination.

Next Steps

To hit the CWISP targets for 2025, an additional estimated investment of approximately KES 900M KES (\$US 7.3M) is required across the value chain. Key priorities for this investment include the construction of 5,000 improved toilets; scaling emptying and transport services to at least six exhuaster trucks, enabling at least 90 pit latrines per month to be emptied; and the commissioning and operational management of the new waste-to-value FSTPs. Wide-ranging support is also required to further strengthen the institutional framework for non-sewered and sewered sanitation, including continued policy formation, implementing the new sanitation development fee, and increased capacity building across the many stakeholders within Malindi.

Conclusion and Lessons Learned

The Citywide Inclusive Sanitation concept has achieved strong buy-in from the sanitation sector globally, but examples are still few. Whilst the work in Malindi remains at an early stage, lessons can already be drawn for other cities looking to achieve the step-change in sanitation which the CWIS approach has the potential to deliver. Critically, the mandated authority, MAWASCO, has taken ownership of the problem, and is providing real leadership in managing the sector. MAWASCO acted decisively in getting support from local CWIS implementers to develop a plan that is realistic, achievable, and context-specific to the city. And the plan is being used effectively to coordinate and stimulate project support – in contrast to the fractured approach of one-off proposals which characterises sanitation sector development in many locations.

City leaders in Malindi are committed to providing universal sanitation services to their people. The Plan is now becoming a reality, slowly turning the tide and bringing back the glory of this touristic town. Through this example, with its technical partners, Malindi has an opportunity to demonstrate what CWIS looks like, in practice, in the Kenyan context and beyond. This, in turn, has the potential to catalyze replication in other urban centres in the country and the wider African region.

Credits and Acknowledgements:

This Practice Note is a collaboration between Malindi Water & Sewerage Company (MAWASCO), County Government of Kilifi, WSUP, World Bank and Sanivation. Authors: Effie Akinyi, Kariuki Mugo, Pascaline Ndung'u, Andrew Foote, Dickson Ochieng, Sam Drabble, Priscillah Oluoch. Design: Amit M Patel.

In partnership with



For more information on the full CWIS plan, please visit:

<https://sanivation.com/briefs/malindi>

<https://www.wsup.com/insights/towards-a-cleaner-and-more-productive-malindi-and-watamu/>

For more information on the wider CWIS initiative, please visit:

<https://www.worldbank.org/en/topic/sanitation/brief/citywide-inclusive-sanitation>

