

Triggers for growing a sanitation business aimed at low-income customers

Experience from five cities

Topic Brief | May 2019





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Cover image: Clean Team staff member, Kumasi, Ghana. **Credit:** Clean Team
Inside cover image: Chazanga pit emptiers on exchange visit to Kanyama, Lusaka.



Image: Woman visits a toilet built by NAWASSCO in Githima, Nakuru County. Credit: Brian Otieno.

Introduction

This Topic Brief presents WSUP’s experience supporting sanitation businesses oriented towards low-income customers in five cities. Each case study highlights changes to the business model or enabling environment with the potential to trigger business growth.

The challenge: developing viable business models to serve low-income customers

Significant progress is being made in sanitation business development in many cities around the world. However, we are yet to succeed in unlocking financial viability for businesses that aim to serve the poorest customers. The reality is that financially viable business models targeting the bottom of the pyramid are currently few and far between.

In WSUP’s experience, the success of sanitation businesses depends on factors internal to the business as well as those external, and out of the control of, the business. We have seen that where businesses and development actors are able to identify and push these trigger points, rapid progress can be made in business growth.

So what is a trigger point, and how can they be identified?

Cost reduction is our first trigger point, demonstrated through the example of Clean Team in Kumasi (Ghana), where mobile money reduced the costs for the business significantly, helping its move towards financial viability.

On the other side of the business model, addressing pricing is a vital challenge: the example of SWEEP in Dhaka shows how differential pricing helped to strengthen the business while enabling it to maintain a focus on Dhaka’s poorest citizens.

However, sanitation business growth is always partly dependent on the wider enabling environment - including financing, institutional frameworks, policies and regulation. In some cases, a single but fundamental change to the enabling environment can catalyse business growth. In the example of Kisumu (Kenya), the introduction of standards to regulate faecal sludge management (FSM) service delivery has helped a licensed sanitation business serving low-income customers, Gasia Poa, to achieve a positive gross margin.

In other cities, the trigger is the creation of public sector commitment to address a range of complex issues: in Nakuru (Kenya), the Nakuru County Government and the utility, NAWASSCO, are implementing a set of actions which are helping to overcome financing, regulatory and institutional bottlenecks to private sector engagement.

Profitable on what basis?

The business models featured in this publication are at different stages of their maturity and vary in the level of profit they are able to achieve. Below we explain the key terminology used in this publication to define their financial performance.

Financially viable: indicates the business model is able to achieve full cost recovery on a sustainable basis, taking account of diverse income streams including public or municipal finance, and external support for access to credit. Clean Team and the FSM service in Lusaka are examples of business models which have yet to achieve financial viability, but which have made substantial recent progress towards this goal.

Commercially viable: indicates the business model is generating sufficient revenue to cover all associated costs and is generating net profit. SWEEP is an example of a business which is commercially viable.

Gross margin: equates to total sales revenue less the cost of services provided, not accounting for management, overhead or capital costs. Clean Team and Gasia Poa are examples of business models generating a positive gross margin, while the FSM service in Lusaka is moving towards this.

Elsewhere, the trigger might be recognition at the city level of a proven – yet small – business model.

In Lusaka, the demonstration of an FSM service aimed at low-income customers in two peri-urban areas, beginning in 2013, has convinced the utility of its role in supporting on-site sanitation service provision, and triggered movement towards citywide FSM services. However, the creation of a functional market which supports private sector provision at the city level in Lusaka will take many years, and the FSM service itself is only now nearing financial viability - underlining that sustained effort is required to ensure the potential of low-income customer business models are fully realised.



Image: Gasia Poa pit-emptying business, Kisumu.

Table 1: overview of triggers for business growth in five cities.

City	Business model	Type of trigger	Trigger for business growth
Kumasi, Ghana	Clean Team: social enterprise offering container-based sanitation services	Internal: cost control	Transition to Mobile Money
Dhaka, Bangladesh	SWEEP: public-private partnership for FSM services	Internal: pricing	Differential pricing for low-, middle- and high-income customers
Kisumu, Kenya	Gasia Poa: public-private partnership for FSM services	External: regulation	Introduction of Standard Operating Procedures (SOPs) for FSM businesses
Nakuru, Kenya	Nascent market	External: public sector commitment	- Introduction of sanitation tariff - Updating sanitation regulations - Developing an onsite sanitation unit within NAWASSCO
Lusaka, Zambia	FSM service managed by community-based Water Trusts under a delegated management arrangement	City-level: demonstration model taken up more widely	Demonstration of FSM service targeted at low-income customers

Clean Team in Kumasi, Ghana

Trigger point: cost reduction

Clean Team Ghana Limited is a container-based sanitation (CBS) service operational in Kumasi since 2012. Having relied on donor support to cover costs in the first phase of business development, adaptations to the business model have triggered an upturn in performance and placed the business on a path towards self-sustainability.

CBS and sanitation service provision in Kumasi

WSUP formed Clean Team Ghana in 2012 as a social enterprise offering a container-based sanitation service to low-income households in Kumasi, Ghana's second city. CBS developed as a response to the challenges of providing safe and affordable sanitation in cities where residents struggle to build or install their own in-home toilet - whether because of cost, space, or tenure constraints. These challenges are present to a large extent in Kumasi and other cities in Ghana, where the sanitation sector is characterised by the high prevalence of pay-per-use public toilets (the leading form of sanitation in Kumasi, presenting issues around safety, security, accessibility and cleanliness); the relatively high cost to the consumer of toilet construction; and high interest rates, making it difficult to access household finance for toilet construction.

Clean Team business model

Clean Team offers an alternative form of sanitation for the low-income residents of Kumasi. The end-to-end service model provides customers with access to a high-quality plastic toilet with a sealable internal waste container. The cartridges are removed from customers' homes by waste collectors twice a week and taken to a transfer station, from where the cartridges are transported in bulk to a processing unit, emptied and cleaned. Following initial processing, waste is disposed of at a septage treatment facility managed by Kumasi Metropolitan Assembly (KMA). Revenues are



Image: Staff member displays Clean Team toilet. Credit: Clean Team.

generated through a subscription model: customers pay a monthly fee for regular collection and replacement of the waste container.

2016 – 2019: business model adaptations

Clean Team is one of several enterprises and NGOs pioneering the development of container-based sanitation worldwide, including Loowatt (Madagascar), Sanivation and Sanergy (Kenya), SOIL (Haiti) and X-Runner (Peru). Collectively these actors, founders of the Container-Based Sanitation Alliance, are piloting a new solution in a challenging sector - an ambitious goal which will take time to achieve. Like other CBS enterprises, Clean Team has required ongoing donor support to cover costs in the first phase of business development.

By mid-2015, Clean Team's 40 employees were serving 900 paying customers and 5,000 users; however, high costs and customer churn meant that Clean Team had a 0% growth rate and a negative gross margin. Following a review of Clean Team business operations in 2015, three key adaptations were made over the following two years in response to challenges faced by the enterprise:

Transitioning to Mobile Money

In September 2016, Clean Team began to implement a Mobile Money (MoMo) payment system with the MTN Ghana telecoms company, aiming to reduce the time spent visiting customers door-to-door and to make payment simple for customers. MoMo allows Clean Team sales officers and account managers to review payments from new and existing customers using Payment apps. This data is all displayed on a management and reporting module, with tools that allow review, approval, set-up and reporting for all customers. Account managers followed a set programme to help customers transfer from manual payment to MoMo.

The transition to MoMo was supported by a marketing campaign to advertise the ease of the new system in Clean Team service areas, through durbars, mass leafleting, stalls at large mosques, and the provision of

MTN sim cards at reduced rates for customers not already on the network. An in-house call centre with a MoMo specialist - responsible for all payment scheduling, notifications and follow-up actions - was established. In April 2017, the price for the Clean Team service was increased by 8.5% for MoMo customers compared to 23% for direct payment customers, encouraging further uptake of the MoMo payment option. This had minimal negative impact on customer numbers.

By mid-2017, 98% of customers had signed a new service contract to use MoMo. The transition to MoMo has brought multiple positive impacts to the business, including reduced operational costs; reduced bad debt; improved payment collection; and improved cashflow, brought about by a shift to advance payments. Combined with the other changes to the business model, MoMo has had a very positive impact on Clean Team's move towards eventual financial viability.

1. Customers' monthly rolling contracts were changed to a **minimum 12-month contract**;
2. **Mobile Money (MoMo) digital payment** was introduced as an option for customers, with payment in advance, replacing time- and resource-intensive manual cash collection;
3. The toilets were **changed from chemical fill to dry fill**, which eliminated the costs of the chemicals, reduced the volume inside cartridges, and enabled a longer gap between collections. As a result, only two collections are now required per week, rather than three.

These adaptations have had a significant impact on business performance, presented in Table 2. Collectively the changes have allowed the business to reduce overheads and implement a small price increase while safeguarding and expanding the customer base.

Conclusion and next steps

From Clean Team's inception, it was clear the enterprise would need to overcome significant challenges to achieve financial viability. These included the limited disposable income of target customers (target Clean Team customers typically earn between 250-750 Ghanaian cedis (GHS) per month, equivalent to US \$50 – 150); Ghana's challenging economic climate for small

Table 2: Impacts of Clean Team business model adaptations.

	2016	2019
Number of paying customers	900	2,000
% paying by Mobile Money	0	98
% customer churn	10	1.5
Growth rate	0%	4%
Average monthly charge	35 GHS	38.5 GHS
Number of employees	40	40
Gross margin	Negative	+30%

businesses; and the socio-economic challenges of providing an unfamiliar service that requires sensitisation and acceptance. The enterprise still has some way to go: it remains reliant on in-kind support from KMA and non-domestic funding. However, internal changes to the business model have had a significant effect on Clean Team performance: from a negative gross margin in 2015, Clean Team's current gross margin is over 30%. Affordability remains a priority: the service is cheaper than regular use of a public toilet, the main alternative in Kumasi. Clean Team has set out its ambition to achieve self-sufficiency by 2022, which now appears a real prospect.

SWEEP in Dhaka, Bangladesh

Trigger point: pricing

SWEEP is a Public-Private Partnership (PPP) for FSM services, first trialled in Dhaka and now being replicated in two other Bangladeshi cities. Customer segmentation is core to the business model, with institutional, high- and low-income customers charged different rates. As the business in Dhaka continues to expand, pricing will be a key variable in securing the profitability, sustainability and scalability of the business.

Sanitation in Dhaka

Dhaka is one of the world's megacities, with a population of around 16 million. Around 80% of these residents depend on pit latrines and septic tanks, which often overflow because of high water use, wastewater generation and frequent flooding: it is common practice in non-sewered areas to discharge waste unprocessed into the storm drain network. In low-income areas, multiple households typically share a single latrine which becomes unusable if not emptied promptly. These neighbourhoods are much less likely to be connected to the storm drain network, and so rely on desludging services.

SWEEP business model

Prior to SWEEP, no private operators existed to provide mechanical emptying services to the vast and largely untapped market for FSM in Dhaka. SWEEP was developed as a PPP arrangement between the Dhaka Water Supply & Sewerage Authority (DWASA) and an SME, Gulshan Clean & Care (GCC). Under the lease-based agreement, GCC acquired access to two 2,000-litre vacuum tankers owned by DWASA, enabling GCC to provide safe and professional FSM services under the WSUP-created SWEEP brand.¹

SWEEP in Dhaka generated net profit within 5 months. As of March 2019, the business in Dhaka had served 260,000 people, generating



Image: SWEEP vacuum tanker in Dhaka, Bangladesh.

\$110K in total revenue, and \$20K total profit for the operator. The SWEEP model has been designed to balance commercial viability with affordability for low-income customers, underpinned by three features:

- 1. Focus on medium and large customers to establish commercial viability:** From inception SWEEP has targeted middle- and higher-income residences and institutions (for example hotels). These customers are willing to pay more for desludging services, providing the business with a higher financial margin. This focus has enabled the business to rapidly achieve commercial viability.
- 2. Differential pricing model to facilitate service offering to low-income customers:** Revenues generated from institutional and higher-income customers have positioned the business to serve low-income households at affordable rates. Through an internal cross-subsidy mechanism, the cost of serving customers living in low-income communities (LICs) is partly covered by higher prices charged to those with larger pits or septic tanks (see p.9).

¹ For more information on the SWEEP model and business performance in Dhaka, see WSUP (2017) From pilot project to emerging sanitation service: scaling up an Innovative Public Private Partnership for citywide faecal waste collection in Dhaka.

SWEEP's differential pricing model

By targeting three customer segments (institutional, high-income and low-income) and charging different rates, SWEEP has been able to establish itself as a profitable business while also improving sanitation in Dhaka's LICs. In Dhaka, SWEEP customers living in LICs are charged \$6-7.50 per cubic metre, compared to \$10-15 for middle-/high-income and institutional customers; these prices correspond to service fees ranging from \$60-75 for small septic tanks, \$150 for medium septic tanks and \$250-1,000 for large septic tanks.

Figure 1: Average price per m³ sludge emptied by GCC by customer segment.

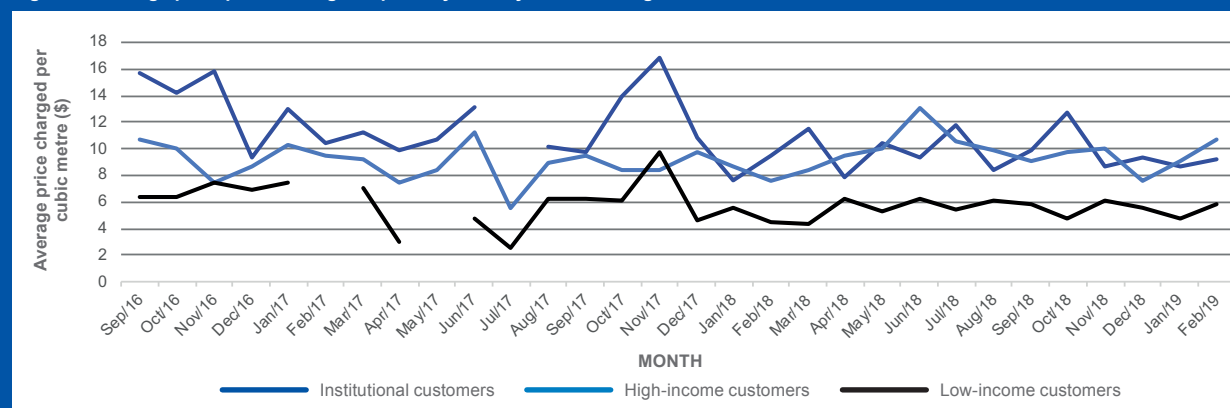


Figure 1 shows the average price charged per cubic metre of sludge emptied by GCC by customer segment. The data shows that on average, GCC are charging within different pricing parameters for the three customer segments, with institutional customers paying the most, and low-income customers paying markedly the least. However, the data also reveals a lack of internal consistency in the amount charged to customers of the same segment (for example, institutional customers served in November 2017 were charged twice the amount per cubic metre as institutional customers served in April 2018). This is partly a reflection of the cultural norm to negotiate over pricing in Bangladesh; but for the business to fulfil its potential, pricing must be set to a level that can maximise revenues (from institutional and high-income customers specifically, and without stifling demand). As part of ongoing business development support to GCC, WSUP is working with the entrepreneurs to refine the pricing model, and to promote greater consistency of pricing within customer segments.

- 3. Contractual requirement for low-income customer targeting:** Once SWEEP established itself as commercially viable in Dhaka, a clause was introduced to the contract in mid-2017 mandating GCC to ensure that 30% of their customers were lower-income, leveraging the guarantee of public sector support offered by the PPP to incentivise equitable service delivery.²

viability. Getting the price right requires robust monitoring processes, flexibility, and adjustment where required; for entrepreneurs like GCC, it is important to understand that pricing is a primary variable in the business model, over which they have control. The SWEEP experience affirms the value of differential pricing as a mechanism to support citywide services that also cater for low-income households. WSUP's long-term vision is for SWEEP entrepreneurs in the cities of Dhaka, Chittagong³ and Rangpur to transition from a lease-based agreement for vacuum tankers to asset ownership, supported by monthly repayments: this will require significantly enhanced utilisation and further adjustments to the pricing model.

Conclusion and next steps

WSUP's experience of supporting FSM businesses in diverse locations consistently underlines the importance of pricing for business

² See WSUP (2018) Incentivising the private sector to target low-income customers.

³ For more information on SWEEP's performance in Chittagong, see WSUP (2018) Adapting and replicating a proven partnership model for urban sanitation: SWEEP in Chittagong.

Gasia Poa in Kisumu, Kenya

Trigger point: regulation

Like many cities in Sub-Saharan Africa, informal manual pit-emptiers proliferate in the low-income areas of Kisumu. Lack of regulation has made it impossible for licensed sanitation businesses with safe emptying practices and higher operational costs to compete. A trigger point was needed to stimulate the market and raise standards all round.

Sanitation services in Kisumu

Nearly half a million people live in Kisumu, the majority in informal settlements. Pit latrines are the most common form of sanitation in these areas, typically shared by an average of 20-30 people. However, no formally licensed pit emptiers operated in the city. Informal emptiers typically worked at night to avoid being fined by Public Health Officers, emptying pits unsafely and only moving sludge a short distance before burying it. This has serious health ramifications for homeowners, the general public and the emptiers themselves, who are directly exposed to faeces in unstable pits that are often used to dispose of solid waste.

An imbalanced market

In order to begin to fill this gap in formal sanitation services, WSUP has been supporting a private solid waste management business – Gasia Poa – to diversify into FSM since January 2017. Gasia Poa is now fully licensed by the Kisumu County Public Health Office and the National Environmental Management Authority to provide FSM in Kisumu's low-income areas. As required by the County Public Health Office, Gasia Poa staff are vaccinated, trained in hygienic pit emptying and sludge transportation, and dispose of sludge safely in KIWASCO's (the city's water and sanitation utility) wastewater treatment facilities.

However, these standards and licensing laws must be enforced if they are to be effective, and Kisumu's unlicensed pit emptiers have not historically faced rigorous sanctions that would incentivise them to change their mode of operation. This has had an indirect impact on formal FSM providers like Gasia Poa, who cannot compete with informal emptiers on costs given their need to pay for transport, safety equipment, vaccinations and staff training. The result is that informal emptiers undercut the prices offered by Gasia Poa and dampen demand for safer, legal FSM services, tilting the market for FSM in Kisumu towards cheaper but unsafe service providers.

Updating regulations for FSM and, crucially, ensuring that all service providers are able and willing to abide by those regulations would create a level playing field in Kisumu. Raising the standards of all those working in pit emptying and FSM could have a considerable impact on the city's environmental sanitation and the bottom line of licensed providers such as Gasia Poa, and would improve the safety and health of informal manual emptiers working in dangerous, unsanitary conditions.

Impacts

1. Gasia Poa is generating a positive gross margin (see Figure 2) while providing emptying services in all Kisumu's low-income areas. The amount charged by Gasia Poa depends on the number of toilet doors and bathrooms which drain to the pit, and will typically range from Ksh 10,000-15,000 (approx. \$100 – 150), compared to Ksh 2,500 (approx. \$25) charged by informal emptiers (although the latter are more likely to be called out multiple times in one year as they will partially empty a pit). Despite the higher charges, customers have reported high levels of satisfaction with Gasia Poa's service, based on professionalism, convenience and operational standards.

Introducing Standard Operating Procedures for all FSM providers

WSUP supported the Kisumu County Public Health Office to develop Standard Operating Procedures for Improved Faecal Sludge Management Services (the SOPs) in 2017. Training materials for the SOPs were designed for FSM operators and the County's own Public Health Officers.⁴ Now, enterprises wanting to work in FSM must undertake SOP training with the Public Health Office, have health insurance, and vaccinate their employees against typhoid, Hepatitis B and cholera.

The SOPs cover every aspect of formalising an FSM business: applying for the required licenses (a Business License, the PHO's Hygiene License and Faecal Sludge Operators License, and NEMA's Application of Waste Transportation License); required actions to cover the full FSM chain, from pre-emptying evaluations of a pit to sludge disposal at the KIWASCO treatment site; and customer relations and monitoring. As the first fully licensed company to offer manual FSM in Kisumu, the owner of Gasia Poa played a key role in the design of the SOPs, ensuring they would not present an excessive burden to other small businesses.

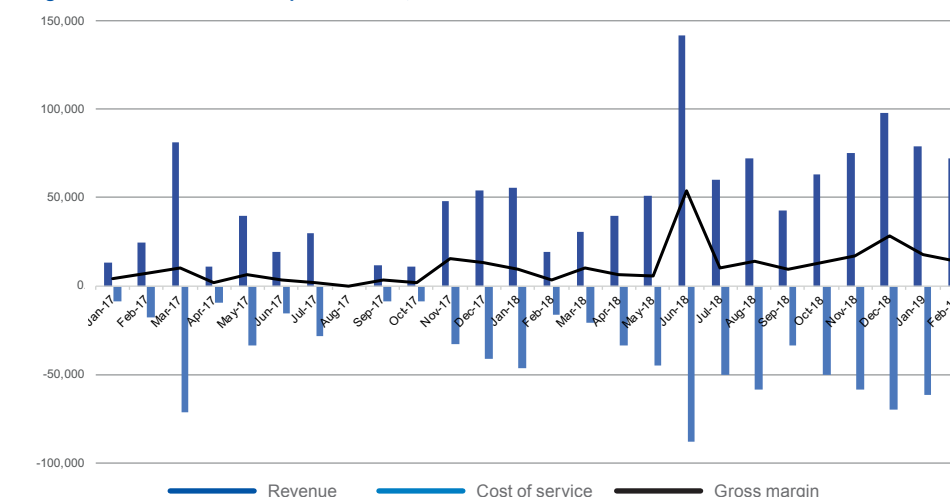
2. The introduction of the SOPs has had a wider bearing on the sanitation landscape in Kisumu. Gasia Poa remains the only company that can reach the required level of compliance with the SOPs, but has been working with the County Government to train other groups of manual pit emptiers. It must be emphasised that the aim is not to put informal emptiers out of business, but rather to raise standards all round: enforcement of the SOPs will improve the health and well-being of all those working in FSM and their customers.

3. The SOPs have been included in the Kisumu County Environmental Sanitation and Hygiene Policy, which is awaiting presentation at the Kisumu County Executive Committee for approval. This will elevate the SOPs to the status of regulations, implying a legal requirement for compliance, for which enforcement will be provided.

Conclusion and next steps

A critical issue in Kisumu was that regulations around sanitation were not fully appropriate for FSM, and were not enforced, nullifying their impact and allowing unsafe practices to proliferate. The development of the SOPs is a corrective to that, representing the first step in a

Figure 2: Gasia Poa financial performance, Jan 2017-Feb 2019.



process of updating regulations to include FSM, which is a necessity in a city such as Kisumu where most people use on-site sanitation facilities. Importantly, the SOPs have been accompanied by training in their enforcement: WSUP has provided training in enforcing the SOPs to the Public Health Office, whose officers have a simple checklist to refer to when monitoring FSM activities in the city.

While the future commercial viability of Gasia Poa is important, it is only one company in a city of around half a million people. The next steps must be for Kisumu stakeholders like the County Government to continue to provide clear guidance about safe sanitation to service providers across the County, and to demonstrate their commitment to ensuring that standards continue to rise to the level of that achieved by Gasia Poa.

⁴ Design of training materials provided by Nicola Greene, independent consultant.

On-site sanitation services in Nakuru, Kenya

Trigger point: public sector commitment

Nakuru County Government and its urban water and sanitation utility, NAWASSCO, are in the process of enhancing an environment that can support future private sector participation. Beginning from a relatively low base point in terms of sanitation coverage, the city is providing a test case for addressing systemic barriers to sanitation services provision.

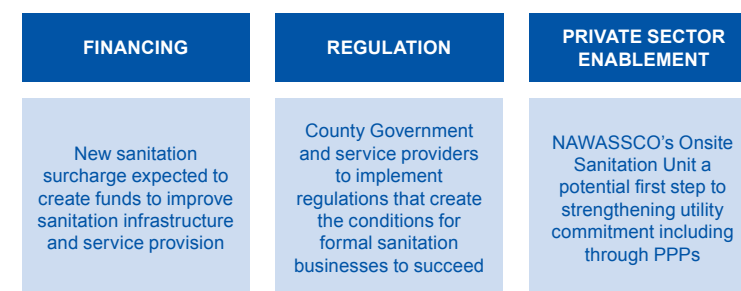
On-site sanitation in Nakuru

Based on conservative estimates, inadequate sanitation loses Nakuru County approximately Ksh 978 million (US\$ 9.7m) each year. In the city of Nakuru, the County capital, less than half of the population have access to improved sanitation, and only 27% are connected to the sewer system. In Nakuru's poorer areas, on-site sanitation infrastructure is inadequate; more than half of toilets in these neighbourhoods are unimproved pit latrines, including unlined pit latrines which can collapse or contaminate groundwater. There are only ten privately owned vacuum tankers operating in the city.

Institutional commitment to sector reform

There is multi-level stakeholder commitment to improving sanitation across the County and within the city of Nakuru itself. The County Government of Nakuru wants to expand sanitation coverage and strengthen its supportive environment in order to improve its national sanitation ranking. Its key objective is to enhance existing sewerage systems and to promote effective sanitation programming through ministries such as physical planning, health, water and housing. NAWASSCO is a similarly proactive body that wants to offer good sanitation service delivery and maintain its high-ranking position in the annual review of the water sector, conducted by WASREB, the national water and sanitation regulator.

Figure 3: Sanitation in Nakuru: ongoing sector reforms.



Both institutions have been exploring ways to improve the current urban sanitation situation, all of which could have significant implications for low-income access to improved sanitation infrastructure and services in Nakuru (Figure 3). While private sector participation in Nakuru has historically been low, these changes could help address systemic barriers and create the conditions for new entrants.

Reform: Introduce sanitation tariff to finance improved infrastructure and services

One mechanism to address the sanitation financing gap in Nakuru is the planned introduction of a sanitation surcharge (or levy) on water bills. This step has been under consideration by WASREB, and was supported by recent research,⁵ which found utility customers connected to the sewer network (including customers in Nakuru) were willing to pay an average of \$1 on their monthly water bills for sanitation improvements in non-sewered areas. WASREB proposed that the research form the basis of a pilot to be administered by NAWASSCO in Nakuru; following approval by the NAWASSCO Board of Directors, the company has sent a formal application to WASREB for consideration.

The sanitation tariff will likely be charged to all NAWASSCO customers connected to the sewer network and will be calculated based on a graduated scale or billing bands, with a maximum charge of Ksh 1000 and a minimum of Ksh 50.

⁵ See WSUP (2018) Willingness of Kenyan water utility customers to pay a pro-poor sanitation surcharge.

Reform: Introduce regulation and strengthen coordination

Over the past few years, Nakuru County Government has been updating urban sanitation regulations. Appropriate enforcement will help to raise standards all round by improving health and safety, preventing the undercutting of formal providers, professionalising informal providers and stimulating fair competition. Two key pieces of legislation have been introduced to strengthen the regulatory framework for on-site sanitation services provision:

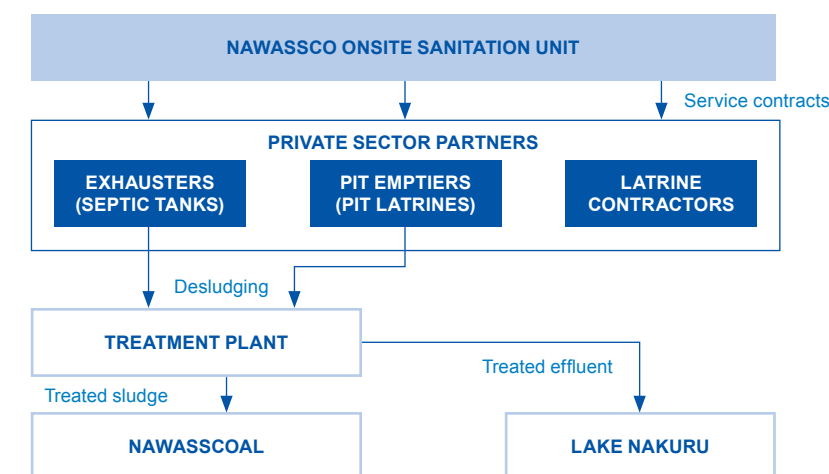
- **Nakuru County Public Health and Sanitation Act, 2017:** Mandates the County to provide companies with a license for transporting and storing waste; ensures safe disposal; provides decentralized treatment facilities; and specifies health and safety standards.
- **Nakuru Public Health and Sanitation Regulations, 2018:** Mandates Nakuru County Government Public Health Office to license faecal waste emptying businesses.

In March 2019, the County Government commissioned a new coordinating body for county-wide sanitation. NACOSTEC (Nakuru Countywide Sanitation Technical Steering Committee) will bring together all County ministries and organisations that have some degree of oversight of sanitation (Health, Roads, Housing and NAWASSCO) to set standards and regulations, establish a private sector monitoring process, and coordinate responsibilities and financial allocations to sanitation (the latter including investment planning and resource mobilisation).

Reform: Develop an onsite sanitation unit within NAWASSCO

Recognising the shortfall in service provision for households not connected to a sewer, NAWASSCO is in the final stages of establishing a unit dedicated to on-site sanitation. The Onsite Sanitation Unit (OSU) will oversee services delivered to non-sewered NAWASSCO customers and those living in low-income areas (as of April 2019, a decision was pending on whether the OSU would be integrated into NAWASSCO's low-income customer services department, or sit outside the existing structure).

Figure 4: OSU proposed service delivery model: NAWASSCO and service partners.



It is proposed that the OSU will oversee pit emptying; septic tank exhausting; community awareness and campaigns; and latrine construction, in partnership with the County public health department.

Models for the OSU are under consideration, with the likelihood that services will be delegated to contracted providers, as presented in Figure 4.

Conclusion and next steps

Private sector participation in urban sanitation requires a supportive enabling environment at the city and national level. Nakuru is an example of a city taking steps towards the creation of this foundational environment: the County Government and NAWASSCO have demonstrated commitment to improving on-site and off-site sanitation and to creating a well-regulated, financed, and sustainable sector (NAWASSCOAL, a subsidiary company of NAWASSCO, also plays a hugely a significant role, closing the sanitation loop by making briquettes from human waste). It must be emphasised that these changes are not yet material: for example, while the sanitation tariff will likely be piloted across the city of Nakuru within the next few months, it will be critical to ensure revenues raised through the new mechanism are spent in a way that genuinely improves sanitation access. NACOSTEC was gazzeted in November 2018 and officially commissioned in March 2019. The OSU will be another significant step forward, providing a focal point and structure for all sanitation service providers in the city.

Citywide FSM business development in Lusaka, Zambia

Trigger point: demonstration

The demonstration of FSM services aimed at low-income customers in Lusaka has helped persuade the utility (Lusaka Water & Sewerage Company, LWSC) of the role it can play in facilitating private sector provision of sanitation services. The momentum created by the FSM services in two neighbourhoods is feeding into the US\$ 15 million on-site component of the Lusaka Sanitation Project, which is being implemented by LWSC from 2018 to 2021.

On-site sanitation overlooked

Only 10-20% of Lusaka is connected to a sewer, with most connections in the centre of the city. The majority of Lusaka's population live in low-income neighbourhoods known as 'Peri-Urban Areas' (PUAs), where on-site sanitation facilities are very common, but there is no safe FSM. Until recently, there was little institutional experience in FSM, and LWSC viewed off-site sanitation as the only solution for Lusaka; FSM and safe manual emptying were also overlooked by city sanitation planners.

Show not tell: demonstrating FSM services in Chazanga and Kanyama

LWSC delegates community-run Water Trusts to manage and deliver water to customers in PUAs. With support from LWSC and WSUP, Water Trusts in two PUAs - Kanyama and Chazanga - adopted responsibility for providing FSM from pit emptying to biosolid production, using LWSC-owned faecal sludge treatment sites.

The FSM services are now fully established, serving 36,449 people to date. The service in Chazanga has experienced compound annual growth rates of around 38% since its establishment in 2014, while its Kanyama counterpart has only seen a 7% growth rate since 2013. Pit emptying has not been profitable

for either Water Trust to date: customer tariffs were deliberately kept low to stimulate demand and to ensure affordability for low-income customers. The service has so far been kept afloat by the revenue earned by Water Trusts' water sales, and through in-kind marketing and business development support provided by WSUP; however, significant adaptations to the business model are now being implemented to enhance viability (see p.15).

Notwithstanding these challenges, the FSM services have achieved their wider goals: providing a safe and affordable service to the low-income households of Kanyama and Chazanga, while demonstrating to LWSC that formal FSM services can perform an effective function in PUAs.

Towards citywide FSM services: the Lusaka Sanitation Project (LSP)

In 2018, LWSC began implementing a loan from several international financial institutions to deliver the Lusaka Sanitation Project, or LSP. Running until 2021, the LSP is designed to contribute towards 100% improved sanitation coverage in the city by 2035, as defined by the Sanitation Master Plan; the LSP aims to expand the city's sewer network, advance on-site sanitation in unsewered areas, and improve LWSC's institutional understanding about on-site sanitation and FSM. This influx of funding gave LWSC the opportunity to reassess the role that FSM should be playing in Lusaka's overall menu of sanitation service delivery options.

By this point, the FSM services in Kanyama and Chazanga were established and providing proven working models. LWSC saw the potential demonstrated by the Water Trusts model, and has also recognised the role that private sector players can play in helping them deliver their mandate: through competitive bidding procedures, LWSC plans to support existing and potential pit latrine and septic tank emptying businesses, as part of efforts to mainstream on-site sanitation across the city.⁶

Chazanga FSM service: business model adaptations

It is important the FSM services in Chazanga and Kanyama demonstrate sustained viability if they are continue their positive influence on citywide FSM service provision. The lack of profitability achieved by the services to date is due in part to the low tariffs charged to customers, which LWSC were reluctant to raise. However, the popularity of the two FSM services among customers, combined with surveys demonstrating that customers were willing to pay significantly more for safe FSM, persuaded LWSC to raise prices in September 2018 (see Table 3).

Table 3: KWT and CWT FSM price change, September 2018.

Customer options	Old pricing	New pricing	% change	Price/m ³ (ZMW)	Price/m ³ (\$)
Small (12 60-litre barrels)	250	350	40	486	40.14
Medium (24)	380	500	32	347	28.66
Large (32)	450	600	33	313	25.85

Other adaptations to the service business models are also having small but important effects on the bottom line of the two Water Trusts' FSM businesses:

- **Infrastructure:** Investments including four new drying beds each in Kanyama and Chazanga have expanded the sites' capacity to treat sludge and minimised desludging downtime and wait times.
- **Transport:** Both Water Trusts now use 4-tonne trucks rather than carts to transport waste from customers' homes to treatment sites, vastly improving efficiency and allowing the teams to reach other PUAs. Staff numbers were also subsequently reduced, saving salary expenditure.
- **Transport charge:** KWT introduced a transport charge of 100 Zambian Kwacha (ZMW) (\$8.26) per job in addition to the tariffs for pit emptying.
- **Selling end-products:** 'BioFerts' biosolids produced by the Water Trusts are on sale for ZMW 25 per 50kg bag (~\$2). Kanyama Water Trust have established a relationship with an educational institution that buys biosolids in bulk, with similar plans in Chazanga.
- **Marketing:** Renewed marketing efforts have included drama shows, door-to-door marketing, focus group discussions, community zone meetings and discussions with church leaders, market leaders, landlords and ward development committees.
- **Toilet database:** LWSC has access to a map of pit latrines in Kanyama, each colour-coded according to how close they were to being full. This has enabled Kanyama Water Trust to target customers more accurately.

Conclusion and next steps

The FSM services in Chazanga and Kanyama have had an outsized influence on the future of on-site sanitation services in Lusaka, helping to set the city on a path towards citywide sanitation. The services have evolved in parallel with other important developments: significantly, on-site sanitation and FSM have been introduced into national planning and standards by NAWASCO, the national water supply and sanitation regulatory body. The Urban Onsite Sanitation and Faecal Sludge Management framework of 2018 outlines the responsibilities for providing FSM and the regulations guiding on-site sanitation more generally – the first such framework in Zambia to directly address these gaps. In addition to completion of the LSP, a critical next step is ensuring successful implementation of the framework.

In the meantime, the FSM services in Kanyama and Chazanga will explore more ways to improve their financial sustainability. In simple terms, this means reducing costs and increasing revenues – steps that any and every business must undertake. Measures now being explored include increasing biosolid sales in Chazanga; introducing a full-emptying service option at a fixed price; transitioning salaries from commission to fixed wage; and possibly purchasing an exhauster truck in Kanyama.⁷ Recent adaptations to the two businesses are already helping the Water Trusts move towards a positive gross margin for their FSM offering (more so in Chazanga, which has both a primary and secondary treatment site). However, the Water Trusts must continue to walk the line of reducing expenditure while providing safe and affordable services, especially in light of the citywide FSM business development under the LSP.

⁶ For more information on the LSP, see WSUP (2018) Towards citywide sanitation in Lusaka: The next phase of non-sewered sanitation.

⁷ For more information on potential changes to the business model for FSM services, see WSUP (May 2019) Strengthening the business model for FSM services in Lusaka: a tariff review process.



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