# Scaling up Faecal Sludge Management in Kenya's Urban Areas

S. O. Okoth, J. K. Ronoh, A. Dubois and D. Mbalo

As in many countries across the developing world, in Kenya on-site sanitation systems predominate in towns. In most cases, faecal sludge from on-site systems is emptied and directly discharged into natural channels, or transported and disposed of untreated into the environment. In 2011, the Government of Kenya, through the Water Sector Trust Fund, commissioned a sanitation up-scaling concept called Up-scaling Basic Sanitation for the Urban Poor (UBSUP), which took into consideration the entire sanitation service chain. Key components of this concept include infrastructure, equipment, and services across the sanitation service chain. Implementation of the model is based on three key pillars: technology, social marketing and business and financing. These faecal sludge management (FSM) solutions are effective, practical, affordable, and do not require significant changes to the toilets which people currently use. From the start of the programme, seven decentralised treatment facilities (DTFs) with the capacity to serve 70,000 people have been constructed in seven towns in Kenya. The programme has also streamlined emptying services by integrating relevant laws into framing a concept for the emptiers. The goal of the programme is to provide a replicable urban sanitation service provision model that can be implemented nationally as a medium-term response to the FSM challenges in Kenya's towns.

## 1 Context and background

Lack of sustainable FSM continues to be a key contributor to the low access to sanitation services in Kenya. The up-scaling programme in Kenya was implemented based on the findings of the study commissioned by GIZ in 2009, 'Improving Urban Sanitation Systems: A rapid response to improve environmental sanitation'. The study revealed that the different sectors involved in on-site sanitation do not pay enough attention to the safe disposal and re-use of human waste. It further established that wastewater management in Kenya has long been neglected, with very little being done to maintain and improve systems. The treatment efficiency at the plants operated by the water service providers (WSPs) is only around 20 percent. For instance, in 2009, only 3-4 percent of human waste and wastewater produced in urban areas was treated. This means 96 percent of sludge ends up on open ground or is diverted into surface waters. The study further notes that financial and geographical factors also limit the extent to which large sewer systems can solve the sanitation crisis by reaching millions in the medium term. These limitations gave credence to the viability of on-site facilities with treatment systems. It was therefore recommended that a combined approach of large sewer systems and on-site based systems was necessary to increase access. Key to the approach was to prioritize urban low-income areas (LIAs) to close the sanitation gap between the rich and the poor. Under the water sector reforms, the Water Sector Trust Fund (WSTF) was mandated to develop and up-scale a sanitation concept.

"Key to the approach was to prioritize urban low-income areas … to close the sanitation gap between the rich and the poor."

- ***Urbanisation trends in Kenya***

Kenya, with a population of 46 million people and a gross domestic product of USD 63.4 billion, is a lower middle-income country. Positive economic growth has been realised in the recent past, in tandem with increasing urbanisation, which has created a growing middle class. However, Kenya has not achieved significant poverty reduction, and poverty levels in the urban areas remain high, with over 8 million people still living in urban low-income areas. The urban population is around about 25.6 percent or 12 million people, and is growing at 4.2 percent per annum. Of the urban population, 33 percent still live below the poverty line, mostly in Kenya's 2,000-plus LIAs.

- ***Sanitation in urban Kenya***

Despite this economic growth and the formal recognition of sanitation as a basic right, investment in network infrastructure has not yet been achieved, particularly in urban low-income areas which are the least well served, although some improvements are being seen. But more seriously perhaps, investment in network infrastructure is failing to keep up with demand in urban areas, generating a large infrastructure and FSM services deficit.

In most towns, the growth in demand for sanitation services exceeds the rate at which the utilities can cope, due to increased urbanisation. The low-income urban population lives in informal conditions, with poor access to basic networked services and an increasing share of informal sector jobs. This situation points to a bleak future for sewerage systems, because on-site technologies are used far more widely than sewerage systems in most urban areas. On average, only 11 percent of Kenya's urban population is connected to sewers; and these are limited to 15 towns serving approximately 1.3 million inhabitants. This means that the remaining 89 percent rely on other types of sanitation, including pour flush with septic tanks or conservancy tanks, ventilated improved latrines and ordinary pit latrines.

## 2 Existing FSM services

The critical and important FSM services for on-site sanitation technologies are emptying and transportation followed by treatment and disposal. The task of sludge emptying and transportation is to be undertaken by the WSPs, as prescribed both under the 2002 Water Act and the recently revised 2016 Water Act. However, since most WSPs lack the specialised equipment (vacuum trucks), the service has largely been left to the private sector, with the public sector playing a regulatory and oversight role. Private entrepreneurs are issued permits by the local authority to allow them to operate their vacuum trucks within their service areas and discharge at designated sites. The emptying is usually done mechanically by vacuum truck. The average fee charged by the owner of the truck (private sector or WSP) is around USD 9/m³ in Nairobi, USD 15/m³ in Mombasa and USD 7/m³ in Kisumu. However, where people cannot afford the mechanised services or the plots are not accessible by vacuum truck, households often resort to non-regulated manual emptying. In Kisumu for instance, mechanical emptying costs on average USD 52 while manual emptying costs an average of USD 30 per trip. Studies conducted in Kibera, a slum in Nairobi, show that 33 percent of the households use mechanical emptying whereas 28 percent rely on manual emptying of their pit latrines. Other techniques used include gravitational emptying where the content of pits and septic tanks is directed to flow to lower channels by means of gravity.

By law, faecal sludge treatment services are to be provided by the WSPs. But in practice, due to limited law enforcement from the Public Health and Environmental Office and the lack of sludge disposal options, faecal sludge from on-site facilities rarely reaches a treatment or disposal facility. Manual emptiers and private vacuum trucks tend to dump sludge where most convenient, including nearby streams, rivers or lakes and bushes, thus creating environmental and public health hazards.

Challenges are most severe in urban LIAs where residents face financial constraints, have little space in which to build toilets, and access by mechanized emptying services is limited. Although in the long term sewerage remains the preferred option, the exploration of lower-cost technologies such as decentralized, neighbourhood-based treatment options is required if poor Kenyans in urban LIAs are to benefit from improved sanitation. In the short term, with many existing treatment plants

"…the exploration of lower-cost technologies […] is required if poor Kenyans in urban LIAs are to benefit from improved sanitation."

(conventional and ponds) operating well below design capacity, it appears that sewerage networks could be extended without the need to invest in expensive additional treatment.



*Figure 1 Manual emptier emptying a pit latrine with a bucket © GIZ/Doreen Mbalo*



*Figure 2 Septic tank being emptied by a vacuum truck © GIZ/Doreen Mbalo*



*Figure 3 Manual emptier discharging the collected faecal sludge in a nearby stream © GIZ/Doreen Mbalo*




*Figure 4 Private vacuum truck at a designated discharge point © GIZ/Alexandra Dubois*

## 3 Policy and regulatory framework

- ***The constitutional context***

The Constitution of Kenya 2010 lays down the framework for development of the sanitation sector under Articles 43(1) (b) and 42 which guarantee the right of every person to "reasonable standards of sanitation," and "a clean and healthy environment". In this context, the government is required to plan and secure the necessary financial resources to execute the functions assigned to other levels of government and to ensure progressive fulfilment of the rights to sanitation and a clean and healthy environment throughout the country. These provisions are put into practice through coordination between several government agencies that have a variety of policy mandates at the national, county and city levels.

- ***The legal and policy context***

Several laws govern the management of faecal sludge. These include the 2012 Public Health Act, which prohibits nuisance caused by offensive waste that is injurious or dangerous to health. The National Environment Management Authority also has regulations about the types of vehicles that emptiers can use, and requires that emptiers hold a waste transportation permit as stipulated in the 1999 Environmental Management and Coordination Act. Recently, the Ministry of Health introduced an environmental sanitation and hygiene policy, which requires that relevant regulatory agencies, including the Water Services Regulatory Board (WASREB), provide guidelines for solid and liquid waste management. At the city level, therefore, the WSPs, which report to the Ministry of Water and Irrigation, are responsible for sanitation service provision. The WSPs are expected to take on the role of managing sludge from the on-site systems within this regulatory framework as mandated under the 2012 Act. However, some WSPs argue that they are responsible only for sewerage management, not for on-site sanitation. Furthermore, most WSPs do not have vacuum trucks, leaving the on-site sanitation service largely to the private sector, with the public sector's role being reduced to regulation and oversight.

- ***Urban faecal sludge management under the current policy***

In 2002, water sector reforms in Kenya culminated in the passing of the 2002 Water Act, which introduced new water management institutions to govern water and sanitation. Under the law, which was revised in 2016, the Ministry of Water and Irrigation (MWI) set up several institutions including the Water Services Regulatory Board and water services providers (the public water utilities in Kenya) among others (Figure 5). To operationalise the new service provision structure for sanitation, MWI developed the Water Sector Sanitation Concept Paper and Implementation Plan (2009) to guide the implementation of sanitation. The WSPs were to take the lead in implementing the concept, including strengthening of FSM services. The current FSM is anchored on the 2016 Water Act, which provides a broad framework and mandates the water companies to offer sanitation services in towns and cities.

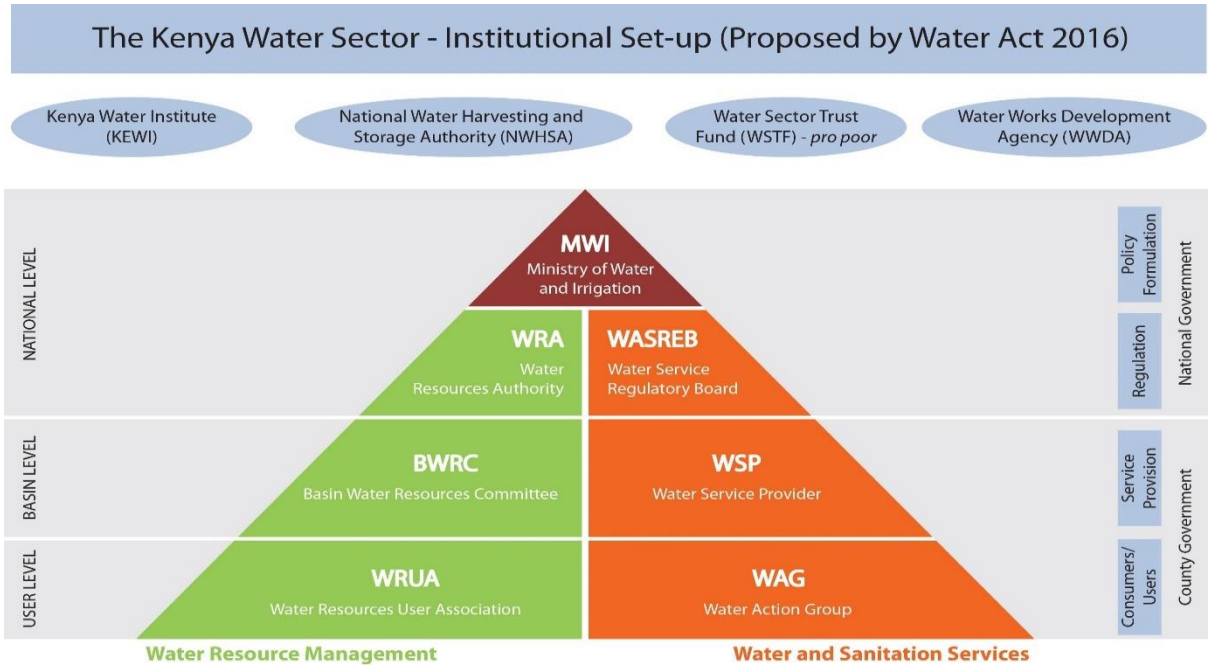



*Figure 5 Water sector structure in Kenya*

## 4 The FSM component of UBSUP

About 89 percent of Kenya's urban population is not connected to sewers and depends on on-site sanitation technologies. This poses grave environment and health risks to both the urban and rural populations from contamination, which results from the haphazard dumping of sludge from on-site systems. Thus, in the medium term there is a need to emphasise improving the 'back end' of the toilet including emptying, transportation, treatment and disposal. Under the framework of the water sector reforms, the WSTF, with technical support from German Development Cooperation (GIZ), initiated a nationwide intervention to improve the sanitation situation through the UBSUP programme. The programme is built around the sanitation service chain principle. It has brought together the regulatory and legal frameworks of the various ministries and state agencies to formulate a national FSM approach, and influence new laws so that they prioritise on-site sanitation based on the principles of complete sanitation service delivery.

The programme, which targets 400,000 people in small and medium towns that do not have sewer networks, is funded by the Bill and Melinda Gates Foundation and the German Development Bank. To date, seven DTFs have been constructed, each with the capacity to treat 22m$^3$ of sludge per day and serve 10,000-25,000 users. This equates to 70,000-150,000 people benefiting from the FSM systems.

"…seven DTFs have been constructed, each with the capacity to treat 22m$^3$ of sludge per day and serve 10,000-25,000 users."

The DTFs are designed to be located conveniently within the towns to provide sludge treatment for both the newly constructed UBSUP toilets and all existing toilets that are of a standard that permits containment and emptying of faecal sludge. The DTFs are small-scale decentralised wastewater treatment plants that cater for sludge from dry and wet toilets brought in by the exhauster trucks or SaniGo. The design of the DTF also incorporates components for processing sludge into organic compost, soil conditioner, treated effluent for irrigation, biogas, and other by-products.

There are significant differences between DTFs and conventional centralized wastewater treatment systems. DTFs are intermediate technologies suitable for most small- and medium-sized towns that have no plans to construct sewerage infrastructure and rely wholly on non-sewered systems that produce faecal sludge. Unlike conventional systems, the DTF approach emphasises low investment and running costs. The UBSUP sludge management model is a better fit for FSM in those towns that do not have sewer networks and conventional wastewater treatment plants. It is an easier investment option for them too, as sewerage systems are difficult and expensive to implement, operate and maintain, particularly for a small WSP.



*Figure 6 UBSUP toilets © GIZ/Dirk Schaefer*



*Figure 7 Sanigo© GIZ/Alexandra Dubois*




*Figure 8 DTF in Machakos © GIZ/Alexandra Dubois*



*Figure 9 DTF in Homa Bay © GIZ/Leonie Kappauf*

- **The implementation process**

The programme commenced by conducting an integrated study to understand the sanitation services landscape in Kenyan urban areas. The study covered technology, socio-cultural, economic, religious and geological aspects of several towns in Kenya. The outcome of the study informed the project team on the most applicable model to implement the programme. This was built on the principle of complete sanitation service delivery. The holistic model considered sanitation financing mechanisms, appropriate technologies and sanitation marketing approaches within the prevailing regulatory framework and the very many relevant policy and legal provisions.

The programme model was then first tested in three towns, during which customer-aided design and feedback from the users and the implementers was used to strengthen the model. The improved model was then rolled out in ten additional towns under the nationwide approach. The upscaling phase has proved successful and the model is now being expanded within the same towns towards a citywide impact.

The programme employed an integrated design approach considering policies, people, the local economic situation and technical options, which resulted in the development of the comprehensive programme concept. Some of the critical development stages in the programme are tabulated below:

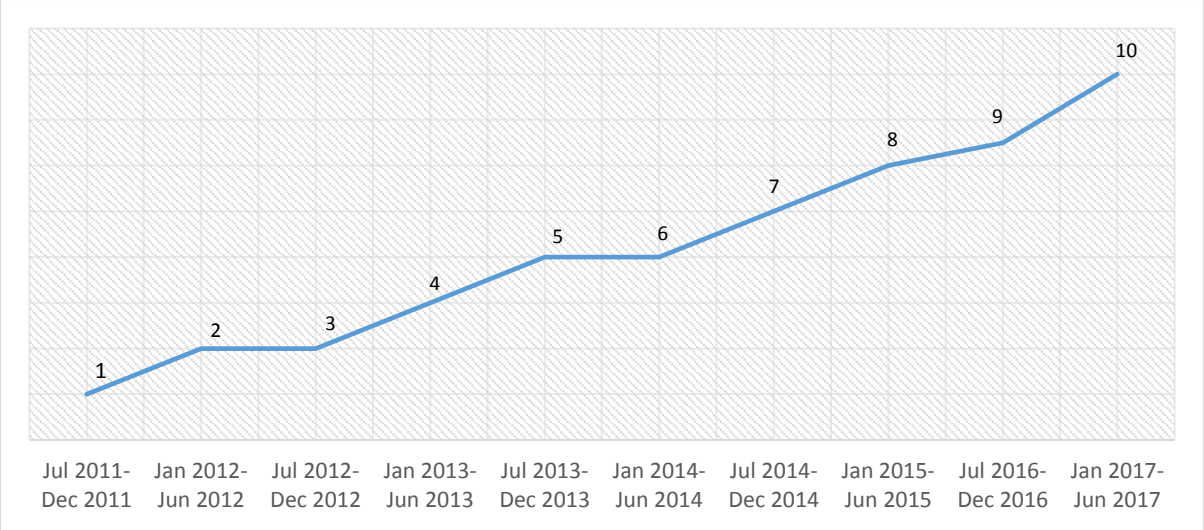



*Figure 10 Programme progress over time*

| No. | Progress | Stagnation |
|---|---|---|
| **1.** | Programme inception and assembly of the programme team was a straightforward exercise, as there were already experts in the WSTF. | |
| **2.** | | Study: Preparation of multi-disciplinary study tools to cover all aspects of sanitation service delivery including culture, technology, socio-economic status and geological and climatic conditions was difficult, as the programme had to get expertise in all these areas. Data analysis was also not straightforward. |
| **3.** | Concept development and designs: there was no reinvention of the wheel. The experts relied on existing technical options for the toilets, which only needed adoption and the development of implementation and operations procedures. | |
| **4.** | Financing: the financing concept for the programme detailing how funds flow from the WSTF to the WSPs for programme implementation was based on the already tested urban programme implementation concept. There was therefore no hindrance to the financing of the WSPs. | |
| **5.** | | DTF design: the design of the sludge treatment facility took long due to the scarcity of land for construction in densely populated neighbourhoods. After the designs, the discussions with various authorities for approval also took time as they had to understand the designs and the proposed operations model. |
| **6.** | Testing and piloting: this process took off well despite initial scepticism among users on payments for toilet construction. This made the construction of toilets surge ahead of the DTFs. | |
| **7.** | Revision of toilet designs through the customer aided design process was easy as there was good cooperation by the beneficiaries. | |
| | Selection of pilot towns | |
| **8.** | | There was generally slow take-off of the DTFs. This was occasioned by lack of land for the facilities. Furthermore, the technology was too complex for the local technicians, who needed to be trained on each of the DTF modules and how set them up on site. |
| **9.** | Integrating the emptiers and the exhausters went well as the authorities had already understood the concept. This was partly because this was a missing link for many towns in Kenya and so the utilities and the counties saw opportunities for sludge management while the exhausters saw an opportunity for operating legally. Influencing policy was easy based on the evidence drawn up based on project activities and progress. | |
| **10.** | The general up-scaling went on well in a logical sequence as had been planned by the programme from testing (one town) – piloting (three towns) – up-scaling (ten towns). | |

*Table 1 Programme progress and bottlenecks the programme had to overcome*

## 5 Financial and economic aspects

The UBSUP programme is designed to create business opportunities for service delivery along the sanitation service chain for WSPs and small-scale private enterprises. Through effective social marketing techniques and post-construction (output-based) incentives, the programme has promoted a total of 8,072 new toilets serving a total of 46,240 beneficiaries. The toilet models range from double vault urine diversion dry toilets (UDDTs) to flush toilets connected to septic tanks (accessible to vacuum trucks) or existing sewer networks. These comprise 98 percent pour flush and 2 percent UDDT. Among the pour flush toilets, 70 percent are connected to septic tanks and 30 percent to sewer networks. Before the next phase of the project, 5,600 toilets are to be built. The post-construction incentive is funded by UBSUP and ranges from USD 150 to USD 200, corresponding to 50 percent of the cost of toilet construction. These funds are paid by the WSP to the toilet owner upon completion, inspection and approval by WSP staff. In some cases, it was observed that local tradespeople were offering payment by instalments to their less fortunate clients once the construction was completed and the money from the post-construction incentive had been received.

"Through effective social marketing techniques and output-based incentives, the programme has promoted a total of 8,072 new toilets, serving a total of 46,240 beneficiaries."

The WSPs are expected to generate revenue through billed water services. The sewer services are charged at 75 percent of the basic water bill. This revenue stream is generated from the new toilets connected to sewer networks. However, in most cases, both the new and existing standard toilets are connected to septic tanks, which need periodic emptying. The WSPs that own vacuum trucks offer the service of collecting and transporting the wet sludge from septic tanks and pit latrines. Areas where WSPs do not have vacuum trucks are usually served by existing private entrepreneurs. Emptying tariffs applied by the public and private sector vary from USD 80 ($8m^3$ truck) to USD 150 ($18m^3$ truck). In the case of UDDTs, local groups of emptiers are identified, trained and equipped by the WSPs with customised motor tricycles called SaniGo, valued at USD 400. An emptier operating a SaniGo charges the toilet owner an average of USD 20 to empty one UDDT vault, and provides the service twice a year. The SaniGo can transport up to $1m^3$ of dry faecal matter, which is equivalent to two vaults. UBSUP encourages the WSPs to outsource collection and transport services to private entrepreneurs in order to ensure a steady supply of wet and dry faecal sludge for further treatment.

To ensure completion of the sanitation service chain, appropriate faecal sludge treatment facilities for WSPs without existing sewerage treatment plants are being provided. Out of the 23 towns where UBSUP toilets were constructed, thirteen DTFs, valued at USD 80,000 each, have been funded by the project. Each DTF is owned and operated by a specific WSP. To date, seven DTFs have been completed and are in operation. Each DTF can receive up to $22m^3$ of wet sludge per day, which corresponds to approximately three vacuum trucks. The WSPs charge between USD 10 and USD 24 according to the capacity of the vacuum truck discharging at the DTF. The tariff is set with reference to fees applied for discharge at conventional treatment plants, but taking into account additional parameters such as the reduced distance for the vacuum trucks, the recovery of capital and running costs for the DTF, and affordability to customers (pro-poor).

| Tariffs for discharge in the DTF | | | |
|---|---|---|---|
| **Truck size** | **Small (5-9 m³)** | **Medium (10-14 m³)** | **Large (15-20 m³)** |
| **Fee per discharge** | **USD 10** | **USD 17** | **USD 24** |

*Table 2 Recommended tariff structure for discharging in the DTF*

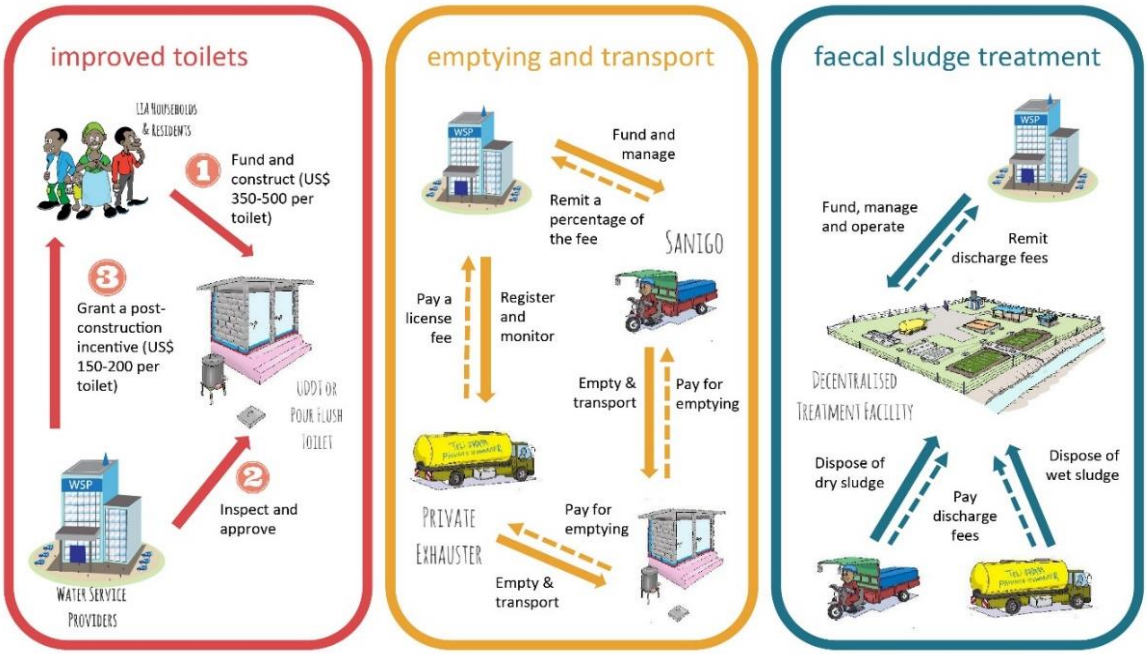



*Figure 11 UBSUP business model*

## 6 Capacity development

Supported by a strong institutional set-up where mandates and responsibilities are clearly defined, competencies and skills in the Kenyan Water Sector are considered to be quite developed. In contrast, the WSTF has said that support was needed in the sanitation sub-sector, which has been recently introduced, in order to ensure service provision in the urban areas of Kenya. The UBSUP programme is a new concept which introduces technologies that are new to the Kenyan context, therefore, capacity development of the programme stakeholders is paramount.

"The UBSUP programme is a new concept that introduces technologies that are new to the Kenyan context, therefore, capacity development of the programme stakeholders is paramount."

WSTF focuses its efforts in building capacity of WSPs as main implementers of UBSUP activities at their level. In each field of activity, WSTF provides specific trainings to the WSP staff (technical and social team) with the objective to train the trainers whose knowledge will trickle down to the actors on the ground involved in the activities related to UBSUP. The strategy of building the capacity of the WSPs is geared to ensure that supervision and monitoring of all activities is done properly at ground level.

Training in toilet promotion and construction, emptying and transport of sludge, and construction and operation of a DTF is provided. The target audiences are social animators, tradespeople, vacuum truck drivers, sanitation teams, DTF contractors and DTF operators. Where possible, UBSUP is taking measures to promote gender balance through capacity building. For instance, participation of women was encouraged in promotion and sensitization activities, given that their position in society plays an important role in the acceptance of the programme by the community.

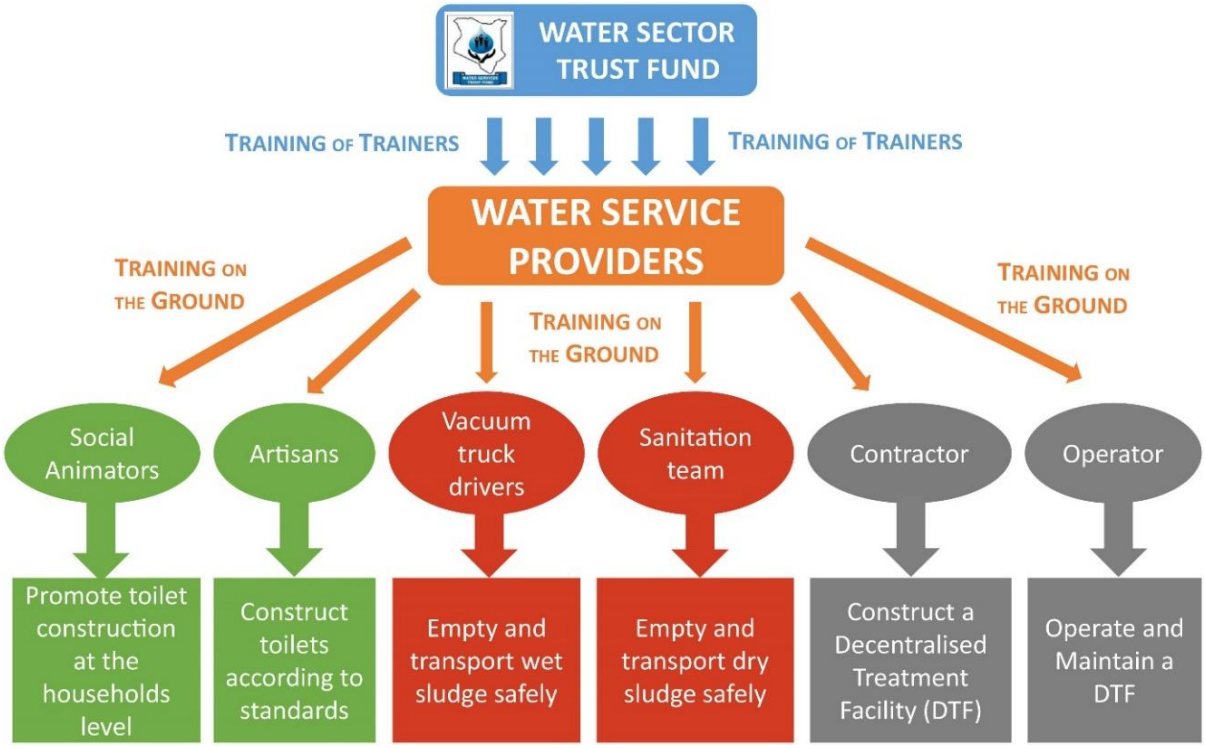



*Figure 12 UBSUP training cascade*

## 7 Drivers of change

The indicators for the SDGs for sanitation require evidence of access to sanitation and of the percentage of population using safely managed sanitation services. This means that all interventions must address the entire sanitation service chain. **The WSTF has identified an opportunity to contribute to this indicator** by framing a national urban sanitation concept built on the principle of the complete sanitation service chain and anchored in sector institutions.

**The development of the decentralised and medium-range sludge management technologies** has ensured that services that previously needed large urban populations in order to achieve economies of scale are now affordable to medium and small towns. Backed by a sound business model along the sanitation service chain, many WSPs are now interested in implementing the FSM concept. The business orientation of the DTFs, the SaniGo and SludgeGo are already promising sustainability in sludge management operations in these towns.

**The regulator, WASREB, recognises the opportunity for the WSPs to increase and expand services** in their service areas even in the absence of conventional sewerage systems. Likewise, the private sector, which had initially had shied away from engaging in emptying and transportation of faecal sludge due to lack of interest as well as a lack of treatment/disposal facilities in small towns, is now more engaged.

### 7.1. *Challenges*

Getting to the up-scaling phase of the programme has not been easy. The barriers and challenges that have had to be overcome include:

- **A lack of standards for toilet facilities and use that permit adequate containment of the sludge and emptying when full**. Most of the existing toilets are latrines with porous pits and non-sealed bottom leading to seepages. These pit latrines are located at difficult corners of small plots and are constructed with no provision for emptying access. Furthermore, there were no guidelines for proper use, making those toilets which are accessible difficult to empty. Most of the toilets contained a wide variety of solid waste, including old shoes, clothes and plastics. This prompted the design teams to set design standards for toilets that would enable proper containment and make emptying easier. The design of the UBSUP thus considered all these design and positioning limitations for the new toilets. A module for proper use of toilets for ease of emptying was developed and shared with the sanitation marketers to educate users.
- The institutional perspective has always been that one day, sewerage systems will be built in all towns. This made it **difficult to convince institutional stakeholders to accept and adopt the intermediate response to sanitation that UBSUP introduced**. The programme had to embark on awareness raising and marketing of the concept among the key stakeholders, who held a strong belief that conventional sewerage was the sole solution for sanitation. Today, encouraged by the UBSUP, most of the counties and WSPs have embarked on on-site systems.
- **UBSUP introduced new designs and structures which**, given the complexity of implementing sound FSM, **needed a testing process that integrates customer-aided-design**. This is an iterative process that takes time to allow for the involvement of all stakeholders in the design and learning process before up-scaling.

## 8 Lessons learned

Because the sanitation upscaling concept was new to Kenya, the UBSUP programme was implemented in stages that allowed systematic inclusion of lessons learned in successive stages. This ensured that there was no waste of resources from implementing unviable concepts for scaling up. To start with, a qualitative study and a detailed quantitative preparatory study were carried out in 2012. These studies established the existing sanitation situation, willingness and ability to pay, and the technologies applied across the sanitation service chain. The results of the study informed the development of the upscaling concept that was tested and piloted in 2013 and 2014. Up-scaling of the UBSUP programme was carried out from 2015, after testing and piloting. The phases helped in identifying lessons that could support the sustainability of the up-scaling concept. Many lessons were learnt during the implementation of these two phases of the UBSUP programme, including the following:

- ***National up-scaling works best with sector structures***

Sector structures are designed to reach every corner of the country, which provides ideal ground for proven concepts to be simultaneously replicated in different areas. In the context of the UBSUP programme, WSPs are mandated by law to provide water and sanitation services, which has made the WSPs and other sector players more aware of sanitation needs and the opportunities that come with up-scaling programmes. This awareness helps drive the integration of up-scaling concepts into government strategies, policies and budgets.

- ***Tried and tested concepts influence policy***

While it is widely believed that policies inform interventions, it is also possible that properly tried and tested concepts can influence policy. From lessons learned, UBSUP made a significant contribution to several chapters of Kenya's Environmental Sanitation and Hygiene Policy (KESH) including giving shape to the chapters on urban sanitation, sludge management, sanitation types and financing. Before UBSUP, urban sanitation and FSM were absent from KESH. After successfully testing and piloting the UBSUP concept, the programme team drew vital lessons about how urban dynamics influence

implementation of the programme, including technology preferences, policy and regulatory gaps, and capacity gaps at various levels including Ministry of Health, WSPs and the county governments. These lessons became the cornerstone of the national concept which was used to influence the urban sanitation chapters of the KESH.

- ***A range of technology options is needed***

In the beginning, UDDTs were exclusively promoted by UBSUP because of their relatively low capital costs and the ease of managing the dry material they produce. The programme did not promote the construction of pit latrines due to the absence of local safe emptying technologies. This changed, however, when the sanitation marketers engaged with LIA residents to market the technology. It turned out that UDDTs were not a popular choice, which proved that providing consumer choice is important for acceptance. Proper use of UDDTs is possible only if they are constructed within one household compound; use and maintenance is difficult if they are constructed on a plot with multiple households. In 2015, the programme allowed the construction of flush toilets connected to septic or conservancy tanks and sewer lines. As a result, the demand for toilets rose dramatically. Currently the UDDTs constitute less than two percent of the more than 8,000 toilets constructed under the UBSUP programme.

- ***There is a willingness to pay for sanitation services***

Contrary to the common belief that the poor do not prioritize paying for sanitation services, UBSUP has shown that, with enforcement of the Public Health Act by the public health department, appropriate sanitation options, and organised FSM systems in place, residents of urban LIAs are willing to pay for quality services.

- ***Developing sustainable demand for sanitation services takes time***

From piloting of the programme in three towns to the implementation of the first phase of the programme, demand for sanitation services was not always obvious and picked up very slowly, thus calling for patience during sanitation marketing. However, after vigorous marketing, construction of improved toilets by households and the first payment of post-construction incentives to the landlords and households by the WSPs, demand picked up dramatically. This suggests that with the provision of affordable technologies and sanitation incentives, poor households are willing to improve their sanitation.

- ***Awareness creation is a necessity for up-scaling***

As awareness has grown, demand for improved sanitation services has grown in many towns in Kenya. Local governments are already planning to finance improvement of sanitation services in various towns based on the up-scaling model. With the successes gained in the areas where the programme has been implemented, it is also expected that convincing potential clients will be easier.

## 9 Outstanding challenges, next steps and plans for going to scale

During implementation, challenges arose that impeded progress. Outstanding challenges include:

- Internal procedures in all implementing partners (for example, the project application process, appraisal and disbursement of funds) that delayed the response in areas where demand for improved sanitation had been created, slowed down uptake. In many cases the **clients adopted a wait and see approach**. In some places people became sceptical because of delayed post-construction incentive payments.
- **Delay in use of the DTFs to full capacity**, due to lack of awareness of the collection and treatment services offered by the WSPs and private operators after the construction and commissioning of the DTFs.

- **Lack of resources to meet demand** for these facilities in many small and medium towns across the country.
- From a study carried out in 2012 on reuse of human waste as processed manure, it emerged that **selling the end-products of processed sludge is not an easy task**, as the WSPs lack the capacity to market them. This slows down maximising revenue from these recycled products.
- **Training and equipping intermediate entrepreneurs** to offer services in places where there are no exhausters.
- Standardisation and compliance with toilet standards that guarantee sustainable containment and emptying of sludge. However, this **requires the combined efforts of all key sanitation players** (donors, politicians, implementing agencies, and enforcement agencies) **to offer affordable technologies, incentives and enforcement**.

The programme has incorporated the lessons learned into the scaling up concept, and will take them fully into consideration when implementing the second phase. A robust social marketing strategy based on best practices in the first phase will shorten the lead time.

To sustain the momentum towards meeting universal sanitation needs, the programme is already lobbying the government for funding for scaling up. Other funding sources will also be approached.

To others that are planning to go to scale, the programme recommends they consider making use of existing sector structures and engage teams that have already gone to scale in order to learn lessons.

**References**

World Bank Group (2017) *World Bank Open Data.* Available at data.worldbank.org/ (Accessed 2 May 2017)
Kenya National Bureau of Statistics (2016) *Kenya National Bureau of Statistics.* Available at https://www.knbs.or.ke/ (Accessed 2 May 2017)

MadjiData (2017 ) *Madjidata The Kenyan online water and sanitation database on low income areas*. Available at http://www.majidata.go.ke/ (Accessed 1 May 2017)
Ministry of Health (2007) *Environmental Sanitation and Hygiene Policy 2015–2030*. Kenya: Ministry of Health. Available at http://www.waterfund.go.ke/safisan/Downloads/Policy%20Sanitation%20and%20Hygiene(1).pdf (Accessed 1 May 2017)

**Abbreviations and Acronyms**

| | |
|---|---|
| DTF | Decentralised treatment facility |
| FSM | Faecal sludge management |
| LIA | Low-income area |
| KESH | Kenya's Environmental Sanitation and Hygiene Policy |
| MoWI | Ministry of Water and Irrigation |
| UBSUP | Up-scaling Basic Sanitation for the Urban Poor |
| UDDT | Urine diversion dry toilets |
| WSP | Water service provider |
| WSTF | Water Services Trust Fund |

**Acknowledgements**

Special acknowledgement to the funders of this programme, Bill and Melinda Gates Foundation, German Development Bank (KfW), Government of Kenya, and German Development Cooperation (GIZ). We also acknowledge the collaboration of the Water Services Regulatory Board (WASREB), Water Service Providers, Ministry of Health (MoH), private exhausters and entrepreneurs in implementation of the programme.

**Authors**

S. O. Okoth, Stockholm Environment Institute - Africa Centre, C/O World Agroforestry Centre (ICRAF), PO Box 30677 - 00100, Nairobi - Kenya, Email: simon.okoth@sei-international.org

J. K. Ronoh, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Water Sector Reform Programme, Maji House, 4th Floor, Ngong Road PO Box 19512-00202, Nairobi, Kenya. Email: james.kiptanui@giz.de

A. Dubois, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Water Sector Reform Programme, Maji House, 4th Floor, Ngong Road PO Box 19512-00202, Nairobi, Kenya. Email: alexandra.dubois@giz.de

D. Mbalo, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, SuSanA Secretariat, Eschborn. Email: doreen.mbalo@giz.de