

Upscaling Basic Sanitation for the Urban Poor (UBSUP) in Kenya



Fig. 1: Project location

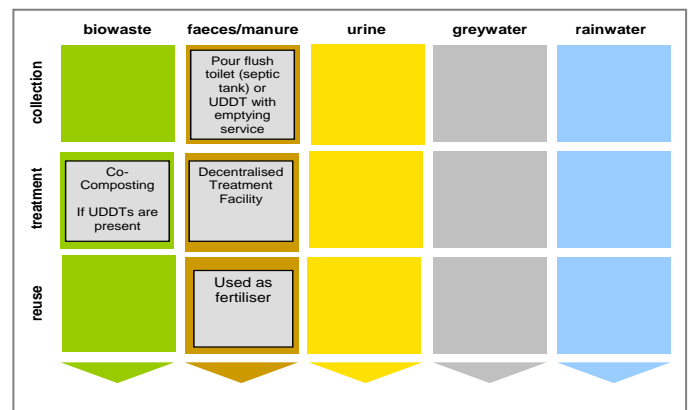


Fig. 2: Applied sanitation components in this project

1 General data about the programme

UBSUP in brief:

UBSUP is a country-wide up-scaling programme aimed at providing access to basic household sanitation across all Kenyan urban low income areas. Implemented through licensed water utilities. UPSUP concept covers the entire sanitation service chain: it incorporates a social marketing concept, technical concepts for infrastructure, emptying and transportation as well as business and financing models.

Project period:

Start of the programme: 2011

End of the programme: 2017

Project scale:

Target population: 400,000

Target number of toilets: 40,000

Total investment: EUR 18.4 m (EUR 9.2 m German Federal Ministry for Economic Cooperation and Development (BMZ) and EUR 9.2 m Bill and Melinda Gates Foundation (BMGF))

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2 Objective of the programme

The UPSUP¹ programme aims to provide household sanitation to 400,000 people living in low income areas (LIAs) in Kenya. The programme covers the entire sanitation service chain. To date more than 6,500 toilets have been constructed

in 23 towns and these are now serviced by 22 Water and Sanitation Service Providers (WSPs/utilities).²

UBSUP is implemented by the Water Services Trust Fund (WSTF) Kenya and jointly financed by the Bill and Melinda Gates Foundation (BMGF) and the German Federal Ministry for Economic Cooperation and Development (BMZ) through the German Development Bank (KfW). Technical assistance to the WSTF and other sector institutions is provided by GIZ. The UPSUP programme has achieved impressive initial results in terms of scaling up access to basic sanitation for households in urban low-income areas in across the country. The GIZ Water Sector Reform Programme team in Kenya recently invited colleagues from other East African GIZ programmes for a peer review. Besides sharing lessons learnt, the objective was to gather feedback to further improve the ongoing scaling up process. This case study is an output of this peer review.



Photo. 1: Typical road in Maina Village, one of the areas where UPSUP is active, with existing sewer line, (photo: E. Schröder, 2015).

3 Location

¹ "UBSUP" is the abbreviation used internally; externally the programme is known as "SafiSan".

² Total number of toilets will comprise new, rehabilitated and improved toilets benefiting from the range of services provided along the sanitation service chain.

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During the first call for proposals phase, 40 utilities out of 94 utilities in Kenya submitted project proposals to expand their sanitation service delivery to households with support from UBSUP. Many of the utilities currently implementing the first phase of the UBSUP projects have so far expressed an interest participating in the next phases of the projects.

UBSUP supports the expansion of basic household sanitation and decentralised collection and treatment of faecal sludge in urban low-income areas. Sewerage coverage in urban areas currently stands at 16% and is declining. Only 27 out of 94 utilities operate sewerage systems according to the regulatory authority (WASREB 2015). Currently, almost 2000 urban low-income areas exist in Kenya, with an estimated population of more than 8 million. UBSUP has supported the expansion of sanitation services in more than 23 low-income areas.

4 Approach of the programme

The Water Services Trust Fund has played a pivotal role in the implementation of UBSUP and scaling up of access to household sanitation in Kenya. Anchored in national water sector legislation the WSTF is an autonomous institution with a mandate to finance the expansion of service provision to marginalized people. It links performance-based financing of service extensions through small to medium sized investments in sanitation infrastructure with capacity development support.

UBSUP is administered through the WSTF's urban investments programme (urban financing window). Water utilities act as implementing agencies. The Fund launches one or two calls for proposals per year, all utilities are eligible to submit proposals for the expansion of services to low-income areas detailing the type of technology to be used and the target number of beneficiaries. Funding is allocated competitively, with proposals evaluated against transparent criteria. Implementation then comprises the following steps:

1. **Demand creation:** Proposals require proof of a minimum demand for 200 toilets in the target area. This minimum number of toilets is established by the utilities before the proposal is submitted using a rapid demand assessment tool provided by UBSUP. During the implementation of the first phase, a comprehensive demand creation is carried out to actualize the construction of this 200 toilets and creation of an additional demand. Demand is created through intensive social marketing activities at household level, promoting toilets "door to door". Local consultants or civil society groups (social animators) are contracted and trained by the utility in order to carry out sensitisation and communication activities in the target area. In addition, the utility has to identify a location for the construction of decentralized treatment facility (DTF) and submit proof of land ownership.
2. **Toilet construction:** Landlords receive financial support for toilet construction via the utility. In order to be eligible, the landlord³ registers with the local utility and identifies a preferred toilet option from a menu of standard options offered under UBSUP. The

landlord then contracts local craftsmen to build the toilets according to the standards specified by the WSTF. Regular inspections of the construction process by members of the WSP staff, the social animators and WSTF-County Resident Monitors (CRM) ensure high quality workmanship is attained. Public Health Officers are involved in the approval process of completed toilets.

3. **Completion of toilets and payment to landlord:** After successful construction of a toilet, landlords receive a fixed amount of 20,000 KES (ca. 180 EUR) per new toilet or 15,000 KES (ca 135 EUR) per rehabilitation. It is important to note that the landlord has to finance the construction costs of the toilets in advance; the partial reimbursement is only released upon completion of construction works and quality control procedures. A toilet is used by up to ten tenants.
4. **Development of sanitation chain:** During / after the construction of household toilets, the utility starts to identify, train and equip local entrepreneurs to empty the toilets (in case of UDDTs) or to service the septic tanks. WSTF provides funding for the construction of decentralised treatment facilities (DTF). The utility commissions the detailed planning and design of a DTF and is responsible for the operation of the facility. One DTF serves about 10,000 people, this includes those using newly constructed toilets (under UBSUP) as well as users of existing toilets that are not yet serviced adequately.
5. **Monitoring:** Access to sanitation is only considered complete once the whole sanitation service chain is covered and operational, i.e. toilets, conveyance / emptying, treatment and safe disposal.

5 Technologies applied

The figure below shows the percentage share of different technologies promoted within the UBSUP programme during its pilot phase and the first call for proposals.

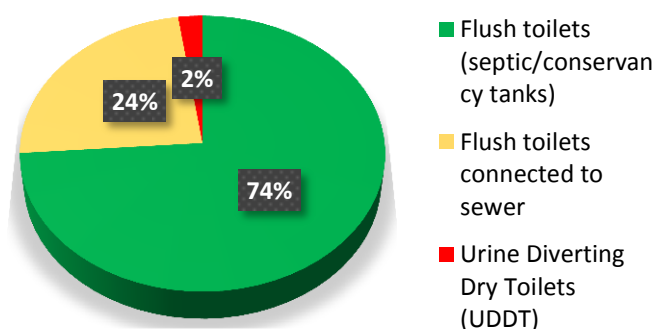


Fig 2. Type of toilets constructed (pilot/first phase)

Water-based sanitation system:

³ In most cases landlords are the building owners, renting out their plots to a number of residents that share facilities.

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- 74 % (4.800 toilets): pour-flush toilet → septic tank → pump trucks → disposal and treatment at DTF
- 24 % (1.550 toilets): cistern / pour-flush toilet → sewer lines → existing conventional treatment plants

Waterless sanitation system:

- Approx. 2 % (150 toilets): Urine-diverting dehydration toilets (UDDTs) → storage in chambers → emptying and transportation by trained sanitation teams using a motorised cart → co-composting within a designated area at the DTF

6 Design information

For each of the components, the UBSUP programme develops and adapts well-engineered and low-cost technologies to fit the context. Standards, guidelines and planning tools are compiled in a toolkit which provides compulsory guidance for all implementing partners to ensure high quality and reduce implementation costs. The toolkit is updated regularly based on the experience gathered during implementation. The toolkit is accessible via the link provided in chapter 13 of this document.

User interface:

The most popular toilets within UBSUP are pour-flush toilets connected to septic tanks (photo 2).



Photo 2: Landlord with three toilets constructed through UBSUP (photo: E. Schröder, 2015)



Photo 3: Row of four single vault UDDTs (photo: J. Kiptanui 2015).

Collection and Transport:

Septic tanks are the most common technology (74 %) for the storage of faecal sludge. They are emptied by exhausters (photo 4).



Photo 4: Large pump truck. Smaller versions are available. (photo: A. Dubois, 2015)

24 % of all toilets promoted by UBSUP are connected to an existing sewer network and an existing and well-functioning conventional treatment plant.

UDDTs (photo 3) have to be emptied manually. The contents are emptied 6 months after the vault is closed for use, after which time the waste is safe to handle.⁴ Dried excreta are extracted and delivered to the nearest DTF by 'sanitation teams' using custom-made sludge transportation equipment (SaniGo, photo 5).

⁴ The bacteriological and chemical characterization of waste was carried out in collaboration with the University of Nairobi.

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Photo 5: A second generation SaniGo; the successor model of the original handcart, in operation. (photo: D. Mbalo, 2015).

The water utility trains sanitation teams and exhaustor (sludge truck) operators in safe toilet and tank-emptying techniques, working business models, occupational health and safety and customer relations.

Treatment:

The locations for DTFs are chosen to minimise transport distances. DTFs can receive faecal sludge from pump trucks and also provide an area for co-composting of the dried excreta from UDDTs. To date, construction of one DTF has been completed with a further ten commissioned and under construction.

The DTFs are dimensioned to serve 10,000 people and comprise a combination of the following modules; settler, anaerobic baffled reactor, and planted gravel filter. In order to simplify the construction and operation of DTFs and lower the costs of construction, the DTFs promoted under UBSUP have been rationalised (e.g. they do not include a bio-digester). They provide adequate low-cost technology to serve low-income areas with simple, effective and cost-efficient designs.

The DTF standard design (illustrated in figure 3) consists of the following components:

1. Receiving bay / balancing tank
2. Settler
3. Anaerobic baffled reactor
4. Vertical flow constructed wetland
5. Sludge drying bed
6. Co-composting area

Utilities may adapt this standard design to the local conditions (space, topography, size).



Fig. 3: Representation of a DTF with standard components highlighted (source: WSTF, SafiSan Toolkit).

7 Type and level of reuse

Water-based sanitation system: The treated wastewater / sludge from the DTF can be safely discharged into the environment. The sludge from receiving bay / balancing tank (1), settler (2) and the anaerobic baffled reactor (3) is dried in the sludge drying bed (5).

Waterless sanitation system: Dried excreta from UDDTs are deposited at the co-composting area where they are mixed with other organic materials and composted for three months. After this time the compost can be used as fertiliser / soil conditioner.

8 Further project components

Apart from the financial support for infrastructure development (toilets, transportation equipment and the DTFs), UBSUP supports the development of capacities within WSTF and utilities in the following areas

- Baseline studies on demand assessment
- Development of a robust information system at WSTF to monitor and report on outcomes as well as tracking the infrastructure (Database with geo-referencing abilities).
- Capacity development
 - Technical trainings (CAD, construction, GIS)
 - Training of social marketers
- Support for sensitisation, social marketing, business and financing models and communication activities
- Administrative support (e.g. waste carrier certificates)
- Technical support (e.g. troubleshooting)

9 Costs and economics

The programme has a total budget of 18.4 million EUR- 50% funded by BMZ and 50% funded by BMGF.

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The water-based toilet construction costs range from 314 EUR to 583 EUR, excluding the septic tank. Construction costs for a waterless sanitation system range from 314 EUR to 763 EUR.

The emptying costs for a UDDT are 18 EUR, to be paid to the sanitation teams that deliver the service as a source of income. The emptying costs for a septic tank lie between 28 EUR and 92 EUR.

The CAPEX for a DTF is 75,000 EUR.

10 Operation and maintenance

Responsibility for the operation and maintenance (O&M) of toilets rests with the toilet users. Social marketers continue to visit households from time to time once toilets are in use. Advice is given to landlords and tenants if toilets are found to be not well maintained / hygienically used.

Being often run as private businesses, the transportation vehicles are operated and maintained by the entrepreneurs themselves, who recover O&M costs through the fees paid by households for emptying services. Exhausters are (often) operated and maintained by utilities.

The DTFs will be operated by the water utility with their staff or private operators through an agreement with the water utility. The private operators would be supervised by the utility. The estimated daily costs of 14 EUR include staff wages, occasional replacement or repairs of material, bi-annual laboratory tests and desludging.

However, there is no practical experience with the O&M of the DTF as none have been put into full operation yet (March 2016).

11 Lessons learnt and recommendations

Lessons learnt

General approach of UBSUP

- Working through existing sector structures – with the Water Services Trust Fund as financing mechanism and local WSPs as implementers – is key.
- Scaling up access to household sanitation requires going beyond sensitisation, social marketing and capacity building. Assisting with infrastructure development with a focus on providing low-cost solutions for the entire sanitation service chain from user interface to treatment facility and safe disposal or reuse is important.
- The capacity of the whole sanitation service chain – not only the toilet itself - determines beneficiaries.
- The calls for proposal allow the incorporation of lessons from the implementation of the previous call rounds into the current process and design standards to be followed by WSPs. Constant reality checks through dedicated county resident monitors in the field help to secure the quality of UBSUP-funded infrastructure.

- Identifying effective target clients to start with and create momentum is important. In the Kenyan context Majidata, a country-wide database on water and sanitation in urban low-income areas, and the WSTF as an interface of technical and financial cooperation act as the main drivers of the scaling up process.

Information is key for scaling up

- The importance of reliable qualitative as well as quantitative resilient field data is emphasised (e.g. through Majidata).

Financing concept

- The approach to financially support the construction of toilets at the household level creates demand for sanitation services. Evidence has shown that without financial incentives and support, very few landlords start to invest in toilets. Reputable, well-trained and committed construction workers should be employed, milestones documented and quotations including bills of quantities communicated in a transparent way (i.e. attached to the contract) so that they can be reviewed by the landlord (building owner), the Social Animators and CRMs.

Technology and Service Chain

- The UBSUP programme covers the whole sanitation service chain. To date more than 6,500 toilets have been built under the UBSUP programme, which are all emptied and serviced by utilities and micro-entrepreneurs.
- Special attention has to be given to the toilets connected to a septic tank. A mix of illegal emptying and dumping by manual emptiers and emptying by official pump trucks is currently being observed.

12 Sustainability assessment and long-term impacts

A basic assessment (see Table 1) was carried out to indicate in which of the five sustainability criteria for sanitation (according to the SuSanA Vision Document 1) this project has its strengths and which aspects were not emphasised (i.e. project weaknesses).

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Table 1: Relative sustainability of project strong points indicated by cross in '+' column; cross in 'o' column indicates average strengths for this aspect; cross in '-' column indicates no emphasis on this aspect for this project.

Sustainability criteria:	collection and transport			treatment			transport and reuse		
	+	o	-	+	o	-	+	o	-
• health and hygiene	X			X			X		
• environmental and natural resources		X		X				X	
• technology and operation	X			X			X		
• finance and economics	X			X				X	
• socio-cultural and institutional	X			X				X	

Sustainability criteria for sanitation:

Health and hygiene include the risk of exposure to pathogens and hazardous substances and improvement of livelihood achieved by the application of a certain sanitation system.

Environment and natural resources involve the resources needed in the project as well as the degree of recycling and reuse practiced and the effects of these.

Technology and operation relate to the functionality and ease of constructing, operating and monitoring the entire system as well as its robustness and adaptability to existing systems.

Financial and economic issues include the capacity of households and communities to cover the costs for sanitation as well as the benefit, such as from fertiliser and the external impact on the economy.

Socio-cultural and institutional aspects refer to the socio-cultural acceptance and appropriateness of the system, perceptions, gender issues and compliance with legal and institutional frameworks.

For details on these criteria, please see www.susana.org: the SuSanA Vision document "Towards more sustainable solutions" (www.susana.org).

UBSUP works through existing national sector structures with the WSTF as partner. By using these structures it contributes to a sustainable sector development in Kenya.

In addition, the regulator approves tariffs which can incorporate cross-subsidies from water services delivery to sanitation: for example currently a sanitation levy paid on top of the water bill is being tested in Nakuru.

13 Available documents and references

The work of UBSUP is open source and can be downloaded from the WSTF website (<http://www.waterfund.go.ke>). It provides all materials that were produced during the work of the UBSUP programme. Apart from application forms for WSPs or users (e.g. building owners) that are partly specific to Kenya, there are technical drawings for e.g. toilets, DTFs or social marketing materials that can be universally adapted and used.

14 Institutions, organisations and contact persons

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Case study of SuSanA projects

Upscaling Basic Sanitation for the Urban Poor, Kenya

SuSanA 2016

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