The Urban Programming Guide

How to design and implement an effective urban WASH programme

Produced by
Water & Sanitation for the Urban Poor

FOREWORD

Since 2006, WSUP has been working to address the global problem of inadequate water and sanitation in low-income urban communities. During that time we've been involved with implementing programmes in eight countries, made possible through the support of committed funders like USAID, who continue to support us under the African Cities for the Future (ACF) Programme. It was at an ACF workshop, in Nairobi in 2012, when Tony Kolb first floated the exciting prospect of an 'urban programming guide'. We loved the idea, and after much thought, we came up with a blueprint for the publication you are about to read.

We wanted a document that laid out the different steps involved in an urban programme, in a coherent and accessible way; a document that was both engaging and useful for funders, governments, implementing organisations and sector practitioners. Of course, the guide draws upon our own experience, and it reflects WSUP's broader approach to urban WASH.

We believe that 100% coverage in a city is possible: it can be achieved by assisting local WASH service providers to extend services to all citizens in their town or city, including those living in low-income settlements. At the heart of this assistance is helping service providers to better understand what services low-income consumers are willing and able to pay for, to find innovative and viable ways to deliver these services, and to develop the skills to take these approaches to scale. This guide shares some of the methods we have found to be effective so far.

We are learning. Urban WASH is a growing challenge and we are committed to documenting and sharing successful approaches that we find. We urge you to try out the guide, use it to help you in your urban WASH work and don't forget to let us know what you think!

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INTRODUCTION

Why urban WASH?

This guide is about how to design and implement a pro-poor urban water, sanitation and hygiene programme.

So why is this important? What's the backdrop to this?

Most developing countries have experienced rapid urbanisation during the past two decades. This process plays a critical role in economic growth: the high concentration of people in cities makes goods cheaper to produce, reduces public infrastructure costs, and attracts the fastest-growing sectors of the economy.[1] Indeed, the global trend of urbanisation has brought millions out of poverty, and helped to bridge the gap between the developed and the developing world.

But this positive picture also has a negative side: a high proportion of people moving to cities are concentrated in low-income informal settlements, either within the central city or in 'peri-urban' districts at the city's ever-growing periphery. In these slum settlements, many people don't have even basic water and sanitation services. The consequences of this inadequate water and sanitation include disease, poor quality of life, and low economic productivity. Diseases related to inadequate WASH remain among the world's most serious public health problems, and the associated impacts on economic productivity and children's cognitive development are likely to have profoundly negative impacts on national development.

Improving water, sanitation and hygiene services to these low-income urban areas is a highly challenging and complex task. Traditional approaches have often failed to work. We need new approaches and fresh thinking. We need governments, donors and sector professionals genuinely committed to improving services in slum settlements. It's challenging but it can be done! This guide offers some solutions based around WSUP's experience: all you have to do is put them into practice!

The scale of the problem

Every second, the urban population grows by 2 people.[2]

828 million people live in informal settlements or slums around the world.[3] The challenge is providing these people with **adequate water and sanitation**.

140 million people in urban areas still use an **unimproved water** source. This number is **rising**, not falling.[4]

The number of people **without improved sanitation** in urban areas has **grown** by **183 million** since 1990.[5]

Diarrhoea kills more young people per year than HIV/AIDS, malaria and measles combined.[6] **88%** of diarrhoea cases worldwide are attributable to **inadequate water, sanitation and hygiene.**[7]

[1] UN-Habitat (2010) State of the World's Cities 2010/2011

[2] UN-Water and WHO (2010) United Nations, Water and Cities Facts and Figures

[3] United Nations (2010) The Millennium Development Goals Report

[4] UNICEF/WHO (2010) Progress on Drinking Water and Sanitation

[5] UNICEF/WHO (2012) Progress on Drinking Water and Sanitation

[6] Boschi-Pinto C, Velebit L, Shibuya K (2008) Estimating child mortality due to diarrhoea in developing countries

[7] UN-Water and WHO (2010) Global Annual Assessment of Sanitation and Drinking Water

About this Guide

What is this guide?

The guide provides an introduction to urban WASH programming: how to design and implement a pro-poor urban water, sanitation and hygiene programme.

The recommendations are drawn primarily from WSUP's extensive experience in sub-Saharan Africa and elsewhere. WSUP currently has urban WASH programmes in 11 cities across six countries (Bangladesh, Ghana, Kenya, Madagascar, Mozambique and Zambia).

Who is this guide for?

This guide is primarily designed for WASH professionals working in governments, development agencies, funding agencies or civil society organisations. It will also be useful for professionals working for service providers including water utilities, local authorities and in the private sector.

How to use this guide

The guide provides an overview of some key strategies and service delivery models. It's not intended to be encyclopaedic: it's a rapid-reference document with the following intended uses:

- To aid the planning, design and implementation of urban WASH programmes.
- To assist with investment planning by service providers.
- To point the reader towards further sources of information and guidance.

The guide's six colour-coded sections will take you through the main elements of an urban WASH programme. Within these sections you'll find a total of 28 Topic Pages highlighting useful approaches and solutions. You'll also see some helpful icons:

= the *key point* to remember about the topic.

= a *real-life case study* from WSUP's experience.

= sources for *further information and guidance*.

Putting it all together!

This is a rapid-reference guide organised around specific topics. But of course all these topics relate to each other, and in any process of programme planning and design you're going to have to integrate individual solutions into a coherent package.

- Take a look at the first section 'Planning, Designing, Influencing'.
- Think about sequencing: for example, if you improve water and sanitation facilities, it makes sense to do hygiene education afterwards, not before.
- Where possible, aim for integrated programming: a programme will achieve much better impact if water, sanitation and hygiene are addressed simultaneously.
- Make sure that women and vulnerable groups are genuinely empowered right from the start of programme planning (see pages 40-43).
- Don't just think about low-income communities: think about supporting service providers to improve services citywide.
- Finally, remember that other organisations in the city are working towards the same goals: work with them!

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PLANNING, DESIGNING, INFLUENCING

Landlords, tenants and land ownership

Understanding local land tenure

Low-income urban settlements are characterised by constantly changing and expanding populations, who live under a range of formal and informal rental agreements. Some settlements are established on public land which is not authorised for residential use, depriving the tenants of a legal right to public services. Even in legal settlements, land being rented to tenants may have been bought and sold informally, and it may be unclear if the landlord has a right to rent the land.

These arrangements greatly influence the extent to which the tenants, landlords and other stakeholders invest in services. Tenants are often short-term residents, sometimes worried about eviction, and therefore unwilling to make large investments to improve their living conditions. Live-in-landlords will have a greater incentive to invest as they share the same environment, if not the same infrastructure, as their tenants; but more commonly landlords are absent, and they neither have to tolerate the poor living conditions of their tenants, nor share the benefits of any upgrading. Consequently, unauthorised settlements with high rates of absentee landlords fail to attract investment in water and sanitation services, and residents continue to suffer from very poor levels of service.

In order to develop improved services, it is vital for programme implementers to have a detailed understanding of tenure and tenancy relationships within intervention districts. WSUP recommends that it is important to:

- Identify the tenure mix of the target population (tenants, owner-occupiers, live-in landlords, absentee landlords) and the types of incentive likely to produce change in each group.
- Ensure dialogue between the different parties (tenants, landlords, public authorities) to develop relationships and raise awareness around the challenges and barriers to service provision.
- Incentivise landlords and encourage investment in the housing stock (but ensure the benefits reach the tenant, not only the landlord); and consider advocacy to encourage regulatory systems that oblige landlords to provide adequate sanitation facilities for their tenants.
- Support the municipality and service providers to strengthen tenure-related policies by, for example, introducing pro-poor tariffs and ensuring gender issues are considered.
- Support service providers in finding appropriate locations for infrastructure early in the programme.

Tenancy dynamics can be complex and are strongly rooted in local social and political history. Taking time at the planning stage of a programme to understand these dynamics in the area of intervention will make a successful outcome more likely.

Experience from Kenya

A high proportion of the target population in WSUP's Naivasha programme area were identified as tenants with no access to hygienic sanitation facilities. In response, WSUP subsidised the construction of shared latrines in tenanted areas. Absentee landlords were required to contribute approximately 60% in cash or in kind, compared to 40% for live-in landlords. In some cases this worked very well: tenants gained 24-hour access to a clean toilet, and raised rents modestly to cover the costs of this service. In other cases, live-in landlords reserved the newly built latrines for their own use leaving the tenants to either use the unimproved facilities or none at all, or charging them (and passers-by) on an expensive pay-per-use basis. WSUP organised round-table meetings to explain to the landlords the by-laws and the tenants' rights and obligations; in most cases, this led to tenants gaining access to the sanitation facilities.

Further reading

- WSUP (2013) Dealing with land tenure challenges in water and sanitation services delivery. Topic Brief 6.

Understanding informal influences

Dealing with vested interests

Over the last decade, programmes in the WASH sector have moved beyond physical construction to include 'softer' components, such as capacity development, institutional advocacy and community education. All interventions, whether 'hard' or 'soft', have tended to be designed within the formal economic, legal, political and regulatory frameworks of the city or country in question. But understanding the formal frameworks is not sufficient: there are many *informal* factors that influence a programme, some obvious and others more discrete, and these need to be taken into account during project planning and implementation. These 'informal influences' relate to individuals' personal attitudes, motivations and social status, and they might include issues around vested interests and corruption. For example, people who are currently making money from supplying low-quality water may not be very happy with a new source of clean water! Informal influences can exist at all levels (national, municipal, local) and they can have a huge impact on programme outputs. Though sensitive and difficult, they need to be confronted.

WSUP recommends the following approaches to help programme managers identify and deal with informal influencing factors:

- Consult broadly with local stakeholders - include other WASH implementing organisations, town planning authorities, and civil society organisations.
- Talk to central government – include influential individuals in project planning discussions.
- Create a supportive enabling environment – involve stakeholders and local partners with diverse but complimentary skills who can offer support in financial, technical, institutional, social and environmental areas.
- Strengthen accountability – develop clear accountability mechanisms for all stakeholders to tackle informal influences arising from corruption and political bias.
- Strengthen the consumer voice of low-income residents – support community-based organisations to voice their needs and encourage service providers to listen.

It is essential to incorporate ***local knowledge*** by consulting communities and local project staff, enabling an environment where they can speak freely, and asking their views on social codes of conduct which may affect access to WASH facilities.

Experience from two cities

Here we report some WSUP experience with vested interests, but we're not going to identify the cities involved! In City A, WSUP is working to improve water supply in a low-income settlement owned by a single landlord. The people in the settlement currently depend on water in unhygienic open tanks: this water is piped into the community by the landlord, who has an illegal unbilled connection to the city's main network. WSUP is negotiating with the landlord to legalise his connection and to allow construction of hygienic standposts within the settlement; we are also negotiating to get the landlord's commitment not to increase rents to cover his water costs after legalisation.

In City B, community groups managing water kiosks are encouraged to invest profits from water sales in sanitation improvements. One community group has saved sufficient money to construct a public toilet, but construction of that toilet is being blocked by a local political figure... because it would take customers from the public toilet he himself owns and operates!

These situations are unpalatable, but they are the hard reality in most slum communities. Direct confrontation is unlikely to work: in WSUP's experience, it makes more sense to quietly negotiate and aim for gradual positive change.

Further reading

- WSUP (2012) Recognising and dealing with informal influences in water and sanitation services delivery. Topic Brief 4.

Advocating for urban WASH

Three ways to influence institutional change

The 'institutional landscape' of urban WASH delivery is generally complex and difficult to navigate! In most cities a diversity of government agencies, service providers and civil society organisations work in water and sanitation, often without coordinating their efforts. At the same time, institutional responsibilities and mandates (especially for sanitation) are often fragmented and unclear, so that implementers are faced with difficult challenges: should we just accept that no public institution assumes responsibility for (say) the management of sludge from on-site sanitation facilities? Or should we become involved in lobbying and influencing to improve institutional frameworks and institutional policies?

WSUP's experience is that it makes no sense to try to work outside institutional frameworks: it is essential to work closely with key institutions, and this almost inevitably implies trying to influence the institutional framework and institutional policies. So how can we do this?

1) Identifying pro-poor champions: Identifying and working with key individual decision-makers can be hugely effective in bringing different actors together to achieve improved services for the poor. Such 'pro-poor champions' can drive change by advocating for an approach and disseminating reports of its success. For examples of WSUP experience in this area, see the case studies below.

2) Working with sector platforms: Strategic WASH planning, at national and city level, is generally coordinated by platforms with participation of key stakeholders (government agencies, water utilities, NGOs, etc.). At worst, these platforms are 'talking shops' which don't really achieve anything; at best, they can be dynamic groups driving genuine change. In Dhaka, for example, WSUP is finding that the Bangladesh Urban Forum is a very useful platform from which to advocate, alongside key partners, for increased government attention to sanitation in low-income communities.

3) Engaging the media: To raise awareness of urban WASH among political leaders, possible approaches include direct contact and stakeholder workshops; but it's also worth considering the mass media. In Kumasi (Ghana), WSUP observed that journalists weren't generally talking about urban WASH. So we developed a proactive response: an analysis of urban WASH knowledge among journalists, and then a targeted training programme focused on the importance of improving WASH access. Result: a marked increase in media reporting around urban WASH.

Experience from Zambia and Mozambique

In both Lusaka and Maputo, WSUP aimed right from the start to develop strong relationships with *senior decision-makers* in WASH agencies, well placed to advocate for change.

Lusaka (Zambia)

In Lusaka, the Managing Director of Lusaka Water and Sewerage Company (LWSC) has played a vital role in improving services for the poor. He has a deep personal commitment to the community-owned Water Trust model for operation of borehole-fed water supplies in areas beyond the utility's reach, and he has established a dedicated Peri-Urban Department within the utility to oversee infrastructure development and agree tariff structures. Developing a strong relationship with this key decision-maker has been critical to the success of the WSUP programme in Lusaka.

Maputo (Mozambique)

In Maputo, the head of the water regulator CRA has been a leading figure, driving change in many key areas. For example, he has led CRA to work with key partners to revise water tariff structures for Maputo, at levels that are both affordable for low-income consumers and sufficient for the service provider's business sustainability. Likewise, he is a key proponent of introducing a sanitation surcharge system (see page 14) to finance sanitation improvements in low-income areas of the city.

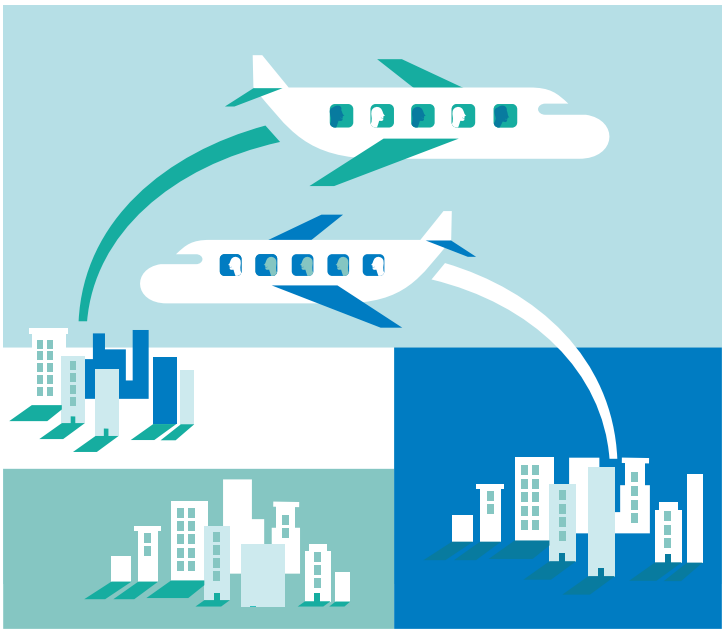
Further reading

- WaterAid (2007) The Advocacy Sourcebook. http://www.wateraid.org/~/media/Publications/advocacy-sourcebook.ashx.

Exposing decision-makers to what works

Training and exchange programmes

As part of the *influencing* component of a WASH programme, programme planners should think carefully about how to inspire sector professionals and decision-makers in ways beyond the work that is directly being implemented. WSUP has found that *exposure visits* and *formal training* provide two useful options for achieving these goals. For example, exposure visits to *other implementers' projects* can provide very useful learning for partners and key stakeholders; observing a successful intervention may persuade the decision-makers to adopt or trial the approach in their own city. Formal training environments can also inspire the leaders of sector agencies to take action, possibly through exposure to new ideas; through appreciating the benefit of extending training to more staff; or through the exchange of ideas from one course participant to another.



Experience from Mozambique and Kenya

Water supply: WSUP invited the commercial director from Maputo's main water operator (AdeM) to visit Manila Water in the Philippines, alongside staff from other sector agencies (FIPAG, the asset holder; CRA, the regulator; CMM, the municipality; and the association of small private operators). The visit had a very positive effect, inspiring these decision-makers to introduce substantial management reforms in Maputo. The reforms included dividing the service area into operational supply zones, each with a zone manager; increasing the 'professionalisation' of meter readers, giving them more responsibility and greater controls on corruption; and the setting of key performance indicators in each zone, notably for new connections and water revenues. In addition, WSUP organised a nine-day specialist training course held at Cranfield University in the UK, for senior staff from sector agencies in a number of WSUP's programme countries. The course included exercises using a utility management simulation (WaterMan) as well as key lessons on how to set fair and sustainable tariffs, and interpretation of standard financial ratios (for example, ROA = return on assets = [net income] / [total asset]).

In Maputo, these two initiatives are widely recognised as having helped AdeM's decision-makers to introduce a new decentralised form of management; this has led to an improved understanding of the specific needs of low-income consumers, and improved delivery of water supply services to *all* customers.

Sanitation: The WSUP Programme in Kenya organised a visit to Brazil for senior managers from Nairobi's main water and sewerage services provider (Nairobi City Water and Sewerage Company - NCWSC), to learn about use of *low-cost sewerage in low-income settlements*. The participants, who included the utility's Technical Director, returned with a determination to use this approach to extend services in Kibera, a large informal area in Nairobi. This represented a significant change of position by NCWSC management. Resulting from the visit, the utility's sewer design specification was immediately revised to allow the use of low-cost sewerage (see pages 34-35) and approval was granted for these local (tertiary) networks to be connected to the city's main infrastructure. In addition, NCWSC management approved a sewer network extension to WSUP programme target areas within Kibera, and committed resources to its construction. Significantly, this is the first time low-cost sewerage has been tested in Kenya, and the project has encouraged a large number of landlords to connect their latrines to the new sewer lines.

Improving sanitation services citywide

Planning is everything!

CHALLENGE:

Many cities in low-income countries lack public investment in the transport, treatment and disposal (or reuse) of faecal sludge. Access to piped sewerage is very limited, and is typically concentrated in the business and high-income districts; low-income residents depend on *on-site* sanitation, and often have to meet the costs of latrine construction and maintenance themselves. This lack of investment often results from poor sanitation planning by local institutions, who prioritise water supply. In addition, large-scale international funding is often biased towards sewerage infrastructure, which usually has limited impact on sanitation services for low-income residents.

This situation creates an investment gap in low-income areas, which is sometimes filled by NGOs and local community based organisations (CBOs). NGO and CBO projects are useful and can improve sanitation access for low-income people but, they are generally small in scale and are rarely coordinated at the city level, leading to issues of long-term sustainability.

WAY FORWARD:

City sanitation planning needs to focus on achievable goals. WSUP's approach is to commission local consultants with a good understanding of the local context, to prepare *outline sanitation strategies*. These include an assessment of the existing sanitation situation, proposals to address the identified challenges with appropriately phased activities, and an indication of the required budget.

WSUP recommends that the process include the following:

- Collaboration with a *wide range of local stakeholders* - representatives from all local WASH sector agencies, SMEs, NGOs, CBOs and from low-income communities - to understand the barriers and identify solutions.
- Inclusion of sanitation solutions that are appropriate for the local context and *owned* by all parties.
- Consideration of the full sanitation chain (collection, transport, treatment and disposal and/or reuse).
- Awareness that the options should complement existing city infrastructure.
- Development of cost estimates that are robust and based on *real* data provided by local engineering contractors and consultants.
- Financial analysis to propose *affordable* consumer tariffs and achieve agreed cost recovery targets.
- Assessment of needs at all income levels, not just in low-income neighbourhoods but middle and high-income households as well.
- Integration of both on-site (pit latrines and septic tanks) and off-site (sewerage) solutions, sometimes in the same area.
- Evaluation of the need for institutional capacity building and reorganisation to construct and operate the proposed services, or to provide oversight of delegated service providers.

Sanitation planning is critical but it needs to be focused and achievable. Over-ambitious 'masterplans' sitting on bookshelves are of no value!

WSUP has used this approach in cities where the level of access to sanitation is very low. In Dhaka, a relatively short, focused planning process was used to prepare sanitation plans for two wards with a combined population of 350,000. In both Maputo and Antananarivo, a longer planning approach was used to quantify the scale of technical, institutional and financial challenges to improving sanitation, not just in selected neighbourhoods but citywide. In all three cases, the process involved meetings and consultation workshops with local WASH sector agencies, small enterprises and CBOs providing sanitation services, and with representatives from low-income inner city and peri-urban communities.

Further reading

- Eawag-Sandec and others (2011) Community-Led Urban Environmental Sanitation Planning: CLUES. Complete Guidelines for Decision-Makers with 30 Tools.
- SuSanA (2012) Planning of sustainable sanitation for cities.
- WSUP and ODI (2012) Getting to scale in urban sanitation. Topic Brief 11.
- WSUP (2013) Financial analysis for sanitation planning: lessons from Dhaka. Topic Brief 10.

Experience in citywide sanitation planning from Madagascar

In Antananarivo, access to sewerage is very limited in the central city area (estimated at 17%), and is virtually non-existent in peri-urban areas. All other residents rely on unhygienic on-site sanitation. Costed at US$ 8.7m, Antananarivo's outline strategy covers both 'software' components such as baseline studies, capacity building and hygiene promotion, as well as implementation on the 'hardware' side, including management of solid waste, excreta, waste-water and storm-water. In part, the five-year strategy relies on users to fund their own sanitation hardware, and to contribute to maintenance of key sanitation infrastructures such as drainage canals. The strategy has been presented to an inter-ministerial committee on sanitation and has the support of the Ministry of Water, though resource commitments have not yet been achieved.

Experience in focused sanitation planning from Bangladesh

Sanitation coverage in Dhaka is shockingly low, particularly for its 3.4 million low-income residents, the vast majority of whom have no access to a hygienic toilet. In order to address this issue, WSUP collaborated with a wide range of institutional, community and academic stakeholders to pilot a Microsoft Excel-based sanitation planning tool in the Mirpur district of Dhaka. Local data was gathered in two wards through interviews, household surveys and transect walks; and total costs were assessed for five sanitation options. For each option the tool generates full costs and calculates the break-even household monthly tariff that would need to be charged to achieve a 25-year payback. In addition, the tool enables a rapid assessment of affordability which considers alternative scenarios such as loan or grant funding of the initial capital expenditure. The Government of Bangladesh has since asked WSUP to continue to collaborate with stakeholders to further develop the tool.

Financing sanitation improvements

Innovative public finance models

Financing improved water services for the poor is challenging: but financing improved sanitation services is *very* challenging! This is essentially because people everywhere are much more willing to pay for clean water, than to pay for systems which keep their neighbourhoods 'faeces-free'. So in most urban contexts, tariff-based financing of sanitation services needs to be supplemented by *public finance*: in other words, by taxes and tax-like mechanisms. Unfortunately, taxation systems (tax collection by local government, and transfer of tax revenues from national to local government) are notoriously unreliable in low-income countries, and only rarely is such funding used to finance sanitation for poor households.

One interesting solution is to use revenue raised from surcharges on water bills. In Lusaka, for example, the water bill of a customer connected to the water and sewerage network has three components: a) a water charge, b) a sewerage charge, and c) an additional sanitation levy of about 4%. This levy is used to support sanitation improvements in non-sewered low-income settlements.

In general, WSUP recommends that funds of this type (raised through sanitation levies or other mechanisms such as local property taxes) should be used to part-finance the *recurrent* costs of sanitation services, for example:

- Faecal sludge management (FSM) services, including operation of sludge treatment facilities.
- Small-item recurrent capital expenditures like communal toilets or targeted household subsidies (e.g. for latrine slabs or sewer connection).
- Hygiene education, sanitation education and sanitation marketing campaigns.
- Ongoing monitoring and regulation of sanitation services.

Strict ring-fencing of these sanitation funds is critical, so that they are not used for water supply or absorbed into the city's general budget.

Experience from Madagascar and Mozambique

Antananarivo (Madagascar)

WSUP is supporting introduction of a surcharge applied to water kiosk revenues in order to finance drainage canal cleaning. Success with the pilot intervention has led to a broadening of activities to include solid waste collection and hygiene promotion. The municipality views the model very favourably and is in the process of scaling it up across the central commune of Antananarivo.

Maputo (Mozambique)

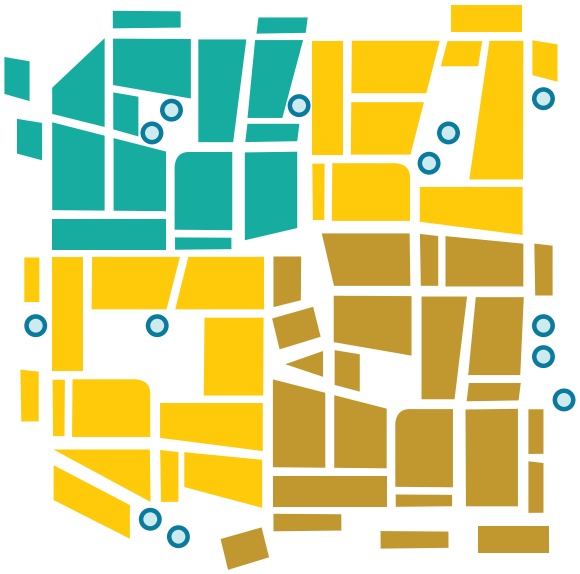
WSUP is advocating for implementation of a sanitation levy on water bills, provided for in law but never applied in practice. The mechanism has the active support of the water regulator who recognises that it could unlock significant funding for sanitation. The proposed system is similar to Lusaka Water's sanitation levy (see above), which has to date raised over USD 2 million; importantly, the Lusaka funds are ring-fenced to finance only sanitation improvements in low-income areas of the city.

Further reading

- WaterAid and SHARE (2013) Evaluating the effectiveness of public finance for household sanitation in Dar es Salaam, Tanzania.
- WSUP (2012) Sanitation surcharges through water bills: a way forward for financing pro-poor sanitation? Discussion Paper 4.
- *Watch out for forthcoming WSUP publications in this area.*

Monitoring service levels

Innovative tracking technologies



Tracking service levels is critical in WASH programmes. *What proportion of households in District X have access to a clean toilet? Are people satisfied with a recently improved service, and if not why not? Is a water kiosk constructed 3 years ago still functioning well?* Traditionally, household surveys and infrastructure surveys to answer these questions were carried out with pencil-and-paper, and reported in printed documents. But new technologies including the smartphone and GPS devices have revolutionised the ways in which useful data can be collected, analysed and reported.

The ability to present data effectively has a number of important applications in WASH programmes. This includes enabling detailed planning and design; providing clear final outputs from monitoring systems; and getting the message across in advocacy activities. Continuing developments in geographical information system (GIS) software now provide *high-impact* techniques for analysing and presenting data. Programme managers can use innovative tools to manage WASH information and overlay it onto Google Earth images. Useful tools include Google Fusion Tables, the Akvo FLOW system originally developed by Water For People, and two tools developed by WaterAid – Water Point Mapper and Sanitation Mapper.

WaterAid's Water Point Mapper is a freely downloadable program that allows waterpoint data to be imported from an Excel spreadsheet and then plotted onto a Google Earth satellite image or map, without the need for internet connectivity. It is aimed at water, sanitation and hygiene practitioners, as well as local government staff working at district, sub-district and village levels. Once appropriate data are uploaded, macros within the program can generate a variety of maps, with automatic colour-coding of points to indicate various characteristics (for example, number of users and operational status). Water Point Mapper has been used by a range of local and national governments, community-based organisations, NGOs, academic institutions and the private sector.

A key advantage of Water Point Mapper is that with only minimal training, local staff can perform analyses that would have previously involved complex software, training and financial resources. A disadvantage is that data input and manipulation are quite time-consuming (for example, drawing district boundaries onto maps requires the user to learn a set of simple but not trivial procedures).

WaterAid's Sanitation Mapper is a related online tool to map sanitation facilities. It consists of a data collection sheet, which is then translated into a series of maps. The tool has been designed to provide both *area-based* mapping, for example the monitoring of improved sanitation coverage at the village level, and *point-based* mapping, notably for identifying the distribution and status of shared latrines in urban areas. Like Water Point Mapper, it aims to provide useful information that will feed into decision-making and planning at district and sub-district levels, as well as information that communities and NGOs can use for advocacy and accountability purposes.

Further reading

- WSUP (2011) GIS & mapping tools for water and sanitation infrastructure. Practice Note 3.
- Water Point Mapper and Sanitation Mapper: http://www.waterpointmapper.org.
- Akvo FLOW: http://akvo.org/products/akvoflow.

Water resource management

Ensuring long-term continuity of supply

When WSUP works in a given location, the end goal is *citywide* service delivery. The possibility of 100% coverage begins with the city's key decision-makers, who must first accept their mandate to service the whole city, including low-income communities. They must also understand that in most cities, achieving full coverage is a *long-term project*. It requires careful planning, sustained commitment, and substantial investment.

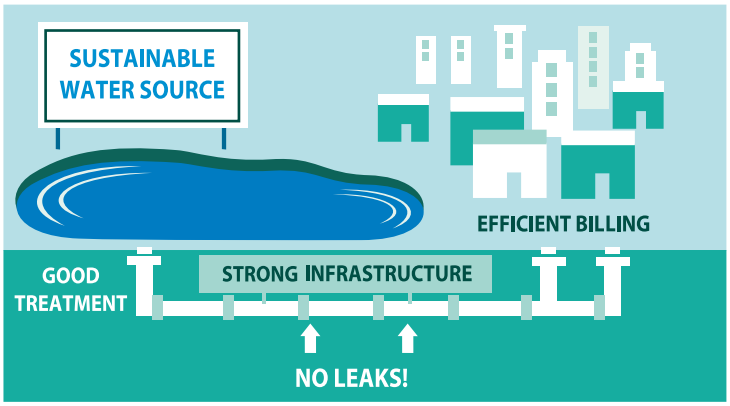
In planning for full coverage, WSUP recommends that decision-makers pay close attention to the issue of *water resource management.* This involves assessing the current situation in the city and making future plans along two dimensions:

1) *Water resources and climate change risks*. Where is the water required for 100% coverage going to come from? Is the city's water supply secure and sustainable?

2) *City-level capacity to manage water resources effectively. Are* we making the most of the water sources we have by effective NRW reduction (see page 27)? Are the city's infrastructure and distribution network up to the task? How should investment be targeted? Are the right political and legal frameworks in place?

WSUP research: Developing a water resource management guidance framework

Recognising the importance of this issue, WSUP is undertaking research in six cities to inform the development of water resource management strategies. The purpose of these strategies will be to help service providers and other influential actors ensure that investments in citywide water management are sustainable from the perspective of long-term, climate-smart water resource management at the river basin scale. Policy research has been conducted in six cities: Antananarivo (Madagascar), Dhaka (Bangladesh), Lusaka (Zambia), Maputo (Mozambique), Nairobi (Kenya) and Accra (Ghana). More in-depth research in Lusaka, Nairobi and Accra is developing demand projection tools. WSUP's aim is to help these cities manage their resources to reach 100% coverage, and to inspire other cities to pursue the same goal. Drawing upon this ongoing work, the water resource situation in Accra is in the experience section below.



Utilities need to think carefully about current and future water resources ***at the basin level,*** and about how to best manage those resources ***at the city level***.

Experience from Ghana

Accra's current water supply situation is typical of many African cities. The utility, Ghana Water Company Limited (GWCL), is unable to meet demand: network coverage is limited to around 73% of the population, on-selling of water by vendors is common, and few households benefit from a 24-hour supply. From a long term perspective however, there are encouraging features of the situation in Accra: evidence suggests that GWCL (not private vendors) produce nearly all the water consumed in the city and that water sources are sufficient to meet both current and projected demand.

With sources relatively secure, the main barriers to universal coverage in Accra lie instead at the *infrastructure and management* levels, with issues around bulk supply, treatment and distribution. Investments have recently been made to upgrade bulk supply and treatment infrastructure, but there remains a need to address weakness in the distribution system. A focus on reducing NRW (currently estimated to be at 60%) and improving water business management has the potential to improve efficiency, and to help move closer to the goal of 100% coverage.

Further reading

- Cranfield University and WSUP (2010) How to climate proof water & sanitation services for the urban poor.

DEVELOPING CAPACITY

Pro-poor units

Establishing teams in utilities to serve low-income areas

This guide acknowledges that providing WASH services to low-income communities is a huge challenge. Many large-scale service providers will find it easier to focus on middle and high-income neighbourhoods: services for which the infrastructure is already in place, the technology is well understood, and the institutional arrangements are embedded. Though an easier option, such a policy leaves thousands or millions of low-income customers without access, and deprives the service provider of substantial revenue.

The capabilities required to serve low-income communities are unique, but they are skills that can be acquired. An effective solution is to establish a dedicated team within a utility (a 'pro-poor unit'), and to equip it with the resources to improve access for low-income residents. This will include appropriately trained staff, technical equipment, adequate finance, and a clear institutional mandate to provide the service. Alternatively utilities can adopt a 'horizontal' approach, in which responsibilities for serving low-income communities are distributed throughout the utility's mainstream operational structure.

WSUP recommends and has supported the development of pro-poor units – also referred to as informal settlement departments, or peri-urban departments – in cities across five countries. Two examples are described below.

Initially the concept of pro-poor units can be 'sold' to other departments within the utility, and to external stakeholders, through pilot ***projects in defined districts***. Once the approaches have been refined, the team can be further strengthened and scaled up to service ***the whole city.***

Experience from Kenya

Nairobi City Water and Sewerage Company (NCWSC) formed an Informal Settlements Department (ISD) in 2007. The ISD focuses on improving water and sanitation services for the many people in Nairobi who live in low-income areas or informal settlements. Typically, ISD programmes involve building water kiosks and sanitation blocks, and letting contracts with water vendors and community-based organisations to manage these facilities. However, the ISD has no commercial mandate, and must defer to NCWSC's Regional Units to perform water or sewerage connections.

WSUP has been supporting the ISD to become more commercially oriented, through a process of *business and strategic review*. This has involved close liaison with the ISD Manager, obtaining the approval of the NCWSC Managing Director, and identifying a Kenyan consultancy firm to oversee the process of change management. The utility has already increased the annual ISD budget from USD 200,000 to USD 1 million. The strategy now aims to ensure that a fixed percentage of the total revenue collected by the utility should come from low-income communities, encouraging the utility to extend and sustain services to these areas.

Further reading

- WSP (2009) Setting up pro-poor units to improve service delivery.
- WaterAid (2009) Water utilities that work for poor people: increasing viability through pro-poor service delivery.
- *Watch out for forthcoming WSUP publications in this area.*

Professional Services Agreements

Formalising partnerships with local service providers

Large urban WASH programmes focused on core city-level infrastructure – whether funded by international agencies or by service providers' own resources - often have a limited impact on services to low-income residents. Investments that aim to improve trunk water networks or primary sewer networks are important, but these networks rarely extend into informal settlements; and even when they do, many low-income consumers cannot afford to pay the connection fees. Recognising this, WSUP's strategy is to negotiate formal agreements with service providers to ensure that investments reach low-income consumers. The partnership arrangements are set out in a Professional Services Agreement (PSA) between WSUP and the local service provider (LSP), which defines:

- A joint programme to be delivered in partnership between the LSP and WSUP in an agreed target area at reasonable scale.
- Mutually agreed resource commitments: from WSUP in the form of technical assistance and grant funding and from the LSP in the form of finance, human resources, materials, and of course leadership.
- Agreed key performance indicators (KPIs) for specific service improvements in the target area (addressing financial, technical and sustainability criteria).

PSAs can be made even stronger where there is financing available from an international financing agency (IFI) such as the World Bank: the service provider can then access *scale-up finance* for those service models that are demonstrated to work. In these cases, WSUP's approach is to secure 'in-principle' agreements from the IFI, to provide the scale-up finance based on achievement of agreed KPIs. The improved services will then be externally audited, and if KPI targets have been met, further financing will be released to extend the programme to new areas of the city.

PSAs can deliver external sector expertise to service providers of all shapes and sizes, whilst leveraging local resources and ensuring the local provider retains the lead role.

Experience from Madagascar

In 2008 WSUP signed a PSA with JIRAMA, the Madagascan national water utility, relating to service improvements in the capital city Antananarivo. JIRAMA's aim was to strengthen its *institutional capacity* and to achieve *greater efficiency*; WSUP agreed to provide capacity building assistance, in return for a commitment to improve service delivery to the city's low-income areas. WSUP support included improving leakage management (to reduce non-revenue water); strengthening business and financial planning, in part through a consumer tariff analysis; and appropriate training.

Direct impacts of the PSA included a huge improvement in continuity of supply to the target areas: 24 hours per day, up from only 3 to 4 hours previously! The commercial viability of the utility was also improved, freeing up water resources that could then be used to improve supply for low-income areas. Recognising the value of this pilot programme, JIRAMA agreed to sign a second-phase agreement with WSUP under which JIRAMA will provide 30% of financing and through which they are committed to meeting specific performance targets.

Incentivised by this progress-linked funding relationship, JIRAMA has recently set up a dedicated *NRW reduction unit* for Antananarivo, and is developing a nationwide urban NRW reduction strategy with WSUP support. The PSA provided a solid partnership framework through which, by supporting NRW reduction and other aspects of business management, WSUP was able to influence policy much more effectively than by simply offering to 'help serve the poor'.

Further reading

- WSUP (2011) Can NRW reduction programmes lead to improved services for the poor? Practice Note 5.

The commercial logic of serving low-income consumers

A demonstration approach

The majority of a large water utility's income comes from high-volume users: large industrial and commercial establishments, public and private institutions (e.g. hospitals), and middle to high-income households. Because all these groups use more water and pay their bills more reliably than low-income customers, utilities focus on supplying their high-volume customers. This leads to a shortfall of resources for low-income areas, even though these areas have the potential to provide substantial revenue. So, in order to increase water supply to low-income areas, the utility must first understand the commercial benefits to them of servicing small-volume consumers at scale.

One way of encouraging utilities to service low-income areas is through *demonstration*. Rather than trying to introduce citywide changes straight away, WSUP's approach is to use a project in a defined area to show how, in a relatively short period of time (generally 6 to 12 months) the intervention will benefit the provider by substantially increasing their revenue. Of course, this increase in revenue doesn't just happen – it is achieved by strengthening the utility's commercial processes (and reducing commercial losses!) within the demonstration area. This can be done by reducing non-revenue water (NRW) through both technical measures to cut *physical losses* (see page 27), and through improving business systems to reduce *commercial losses* (including improved metering, billing and collection). Remember, the stronger the commercial structures of a utility, the more obvious the benefits of serving low-income areas will become.

By improving a provider's business management systems within a demonstration area, the implementer can highlight the commercial gains of expanding this approach to other low-income districts.

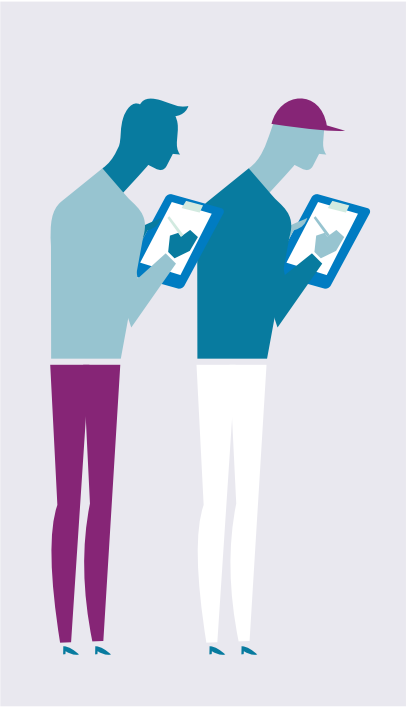
Experience from Mozambique

In order to meet the demand from Maputo's low-income residents, the mandated water utility Aguas Região de Maputo (AdeM) agreed to trial a delegated management arrangement (see page 28) with a local private operator, EMA. The agreement stated that AdeM would provide bulk water to the operator, who would be responsible for distribution, meter reading and billing in a discrete area. The rationale was to provide a focused approach to the specific problems of the low-income district: as a locally based private operator, EMA was 'closer to the customers' than the larger utility, and positioned to provide a rapid response to issues 'on the ground'.

WSUP provided technical support to EMA, helping them to validate the customer database; set up a simple spreadsheet to manage billing and monitor revenue; and make improvements to field operational activities such as meter reading, billing clients without delay, and tracking of late payments. Prior to the intervention these activities were almost non-existent in the area. EMA's performance was tracked monthly using key performance indicators (KPIs), and produced impressive results: revenue receipts increased by over 100% in just under three years. AdeM is now considering replicating the arrangement with a second operator in another neighbourhood.

Tracking coverage and service quality

Developing capacity for monitoring WASH



WASH-implementing organisations cannot provide support indefinitely in a given city. The aim of WSUP's presence in a location is to build the capacity of local service providers (LSPs), to the point that WSUP's support is no longer needed. This means working with the LSP to establish the necessary processes for them to provide a quality service over the long-term, without need of external intervention.

To achieve this goal, LSPs must be equipped with the tools to *monitor* operational performance. For example, a water utility looking to assess its own performance will need up-to-date information on indicators including non-revenue water, bill collection ratio, operating cost coverage ratio and average hours of supply. The utility will also need clear procedures to help consumers request connections, pay bills and report problems. WASH-implementing organisations can provide utilities with technical support, helping to ensure that robust monitoring processes are put in place.

A second factor in this equation is capacity support to the water services regulator. The regulator is mandated with the task of ensuring that consumer tariffs are both affordable and sufficient for the LSP to deliver a sustainable service. Helping the regulator to analyse existing tariff structures will ensure both that tariffs are affordable in the here and now, and provide the regulator with the skills to undertake further tariff reviews in the future. The regulator will also need systems to track whether coverage and service quality are adequate.

Ensuring that WASH monitoring data is clearly documented and publicly available will strengthen accountability and drive forward performance improvements.

Experience from Kenya

WSUP supported local service providers in Naivasha to improve water and sanitation services in two low-income peri-urban neighbourhoods with a combined population of over 65,000. Following completion of the infrastructure, WSUP provided training and support to the utility in improving a computerised billing and accounting system to monitor water sales. The system will provide a valuable monitoring tool as meter coverage and usage increases in the future.

Experience from Bolivia

Water For People–Bolivia (WFP-B) has developed a programme to address water and sanitation needs in six rural municipalities and one peri-urban area with a total combined population of nearly 140,000. Within each of these locations WFP-B works with local government, communities, schools, private companies and civil society organisations, to ensure water and sanitation coverage under its 'Everyone Forever' programme. As a vital part of this effort, WFP-B has built the capacity of the local municipalities to ensure they can monitor and sustain service provision once WFP-B is no longer working in each location. With WFP-B's support, each municipality established a Municipal Basic Sanitation Unit to assist communities with water system operation and maintenance, monitor water and sanitation related projects, support local NGOs in the field, understand community needs, and provide health and hygiene education. As the demand from communities for WASH services increased, the units have grown from one to several staff, and today they are known as Departments of Basic Sanitation (DMSBs). WFP-B continues to support the DMSBs, coordinating their water and sanitation programmes and providing ongoing training, building a solid foundation that will enable the DMSBs to ensure WASH services into the future.

Further reading

- For Water For People experience: see Water For People-Bolivia website.

Improving faecal sludge management (FSM)

The sanitation chain at city level

CHALLENGE: In low-income cities, huge numbers of people rely on non-sewered sanitation systems, such as pit latrines and septic tanks. These systems generate enormous volumes of semi-digested faecal waste, generally termed 'faecal sludge'. If not managed properly, faecal sludge can pose massive risks to public health and to the local environment. Management of faecal sludge often fails at the household level, because pits are poorly designed, difficult to empty, and/or subject to flooding. Similarly, pit-emptying services are generally inadequate, with unhygienic working practices and improper discharge of sludge to storm drains, water bodies, or solid waste disposal sites. In most low-income countries, only a tiny fraction of faecal sludge is safely managed.

THEORY: Faecal sludge management (FSM) is a five-step process, as shown in Figure 1. At one end of this 'sanitation chain' is containment, i.e. the toilet: this may be a household toilet paid for and maintained by the householder, or some other arrangement (e.g. a communal toilet paid for by local government and maintained by a user group). Once the pit or septic tank is full, it needs to be emptied and the sludge needs to be transported to the treatment location: this can be done by a private or public operator, who may have to invest a substantial amount of money in equipment. And finally there is treatment and reuse/disposal: this is typically a publicly provided service, requiring a large capital investment in infrastructure.

Figure 1: The sanitation chain

REALITY: The theory of a functioning sanitation chain is well established: but the situation in most low-income cities is unfortunately much more complex. Figure 2 summarises what happens to sludge in Maputo (Mozambique): most of the waste flows untreated into Maputo Bay, and only a very small proportion is safely treated. Raising funds to pay for the operation and maintenance (let alone the capital costs) of publicly provided sanitation services is very challenging. People in general (wealthy people connected to sewers, poor people dependent on FSM) have a low willingness to pay for public services that improve sanitation beyond their own home. At the same time, decision-makers are often constrained by a political agenda (see page 11) that does not enable them to charge households for sanitation services, and institutional responsibilities are often very poorly defined: in most cities it is simply not clear which institutions (the utility? the municipality? some other body?) have responsibility for the different aspects of FSM, including infrastructure investment, service provision, and regulation and enforcement of regulations.

WAY FORWARD: Building capacity along the *entire* sanitation chain is essential. Within a city-level FSM programme it is important to ensure that:

- Each part of the chain has adequate technology and infrastructure, so that waste is i) hygienically contained in pits and tanks, ii) safely collected and transported, and iii) properly treated and properly disposed or reused.
- Households, private operators, civil society organisations and public institutions work together to ensure a safe and effective sanitation chain.
- Appropriate regulations are in place (and enforced!) to ensure that a) households empty their pits and tanks as required, b) consumer tariffs are affordable but at the same time sufficient for commercial viability, and c) operators dealing with emptying, transport and treatment/ disposal/reuse follow acceptable practices.
- Public finance inputs are sufficient to create infrastructures (e.g. treatment sites) and systems (e.g. regulatory enforcement systems), such that private operators can then run commercially viable businesses.

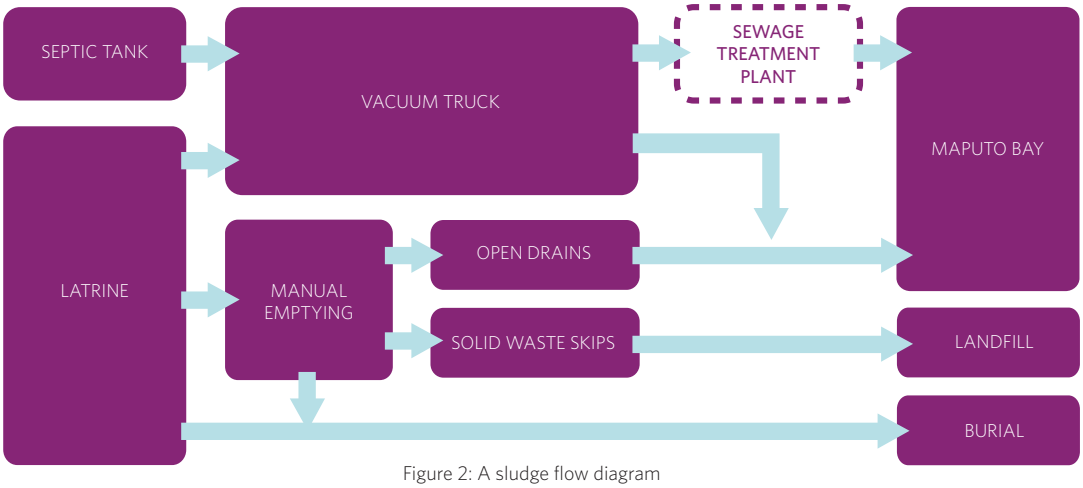


Figure 2: A sludge flow diagram

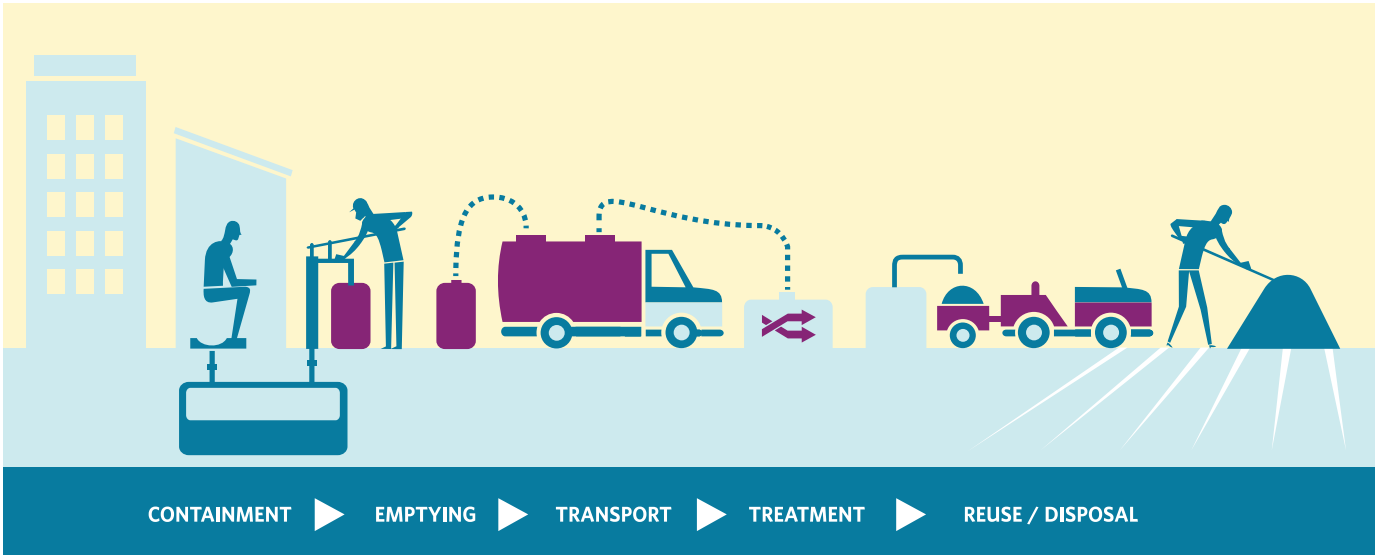


Illustration adapted from the Bill & Melinda Gates Foundation 'Sanitation Value Chain' graphic.

Resolving the FSM crisis in low-income cities requires viable private enterprises: but for these enterprises to work effectively, there needs to be serious institutional commitment, including investment in infrastructure and in regulatory systems.

Experience from Zambia

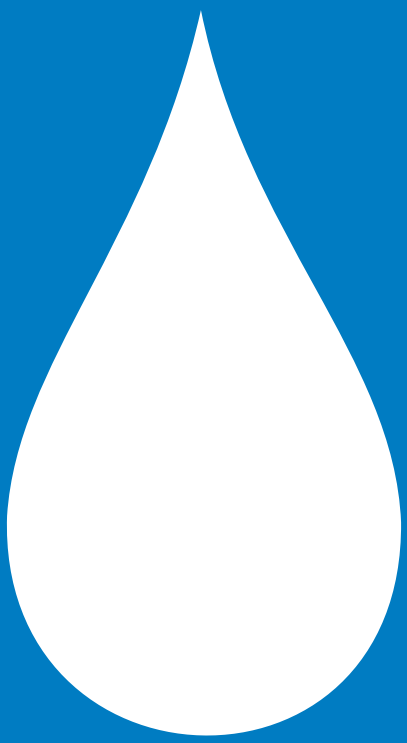
Lusaka Water & Sewerage Company (LWSC) is mandated to provide water and sanitation services in Zambia's Lusaka Province. In order to better reach low-income communities, a form of community-led delegated management model has been developed, initially by CARE Zambia. These 'Water Trusts' are responsible for day-to-day management of water services in low-income informal settlements (known locally as 'peri-urban areas'), under a Service Management Contract with LWSC. So far 11 Water Trusts have been established in 11 peri-urban areas, and at least 8 of these collect sufficient fees to cover their operating costs.

Given their success in water services, Water Trusts are now being encouraged to become involved in FSM. Supported by WSUP and LWSC, with funding from the Stone Family Foundation (SFF), the Kanyama Water Trust piloted FSM services in February 2013, aimed at reaching a target population of 40,000 people. Households are now provided with collection and transport services for faecal sludge from pit latrines. The sludge is temporarily stored and undergoes partial treatment at a neighbourhood transfer station, before being transported to drying beds for final treatment. Biogas produced during anaerobic digestion at the transfer station is used for cooking. Plans are in place to sell the dried sludge for agricultural use: there is good demand for this in Lusaka.

Data collected during this pilot is promising. Scale-up is already underway in Kanyama (with the goal of extending the service to a further 120,000 people), as well as in the nearby area of Chazanga. Several challenges remain, however, including the relatively weak capacity of some of the Water Trusts; the frequent disposal of non-biodegradable garbage to pits; and the relatively high cost to householders of the pit-emptying service, so that demand remains limited.

Further reading

- Eawag/Sandec (2008) Faecal Sludge Management. Sandec Training Tool 1.0 – Module 5.
- Muximpua, O. and Hawkins, P. (2011) Building blocks for effective faecal sludge management in peri-urban areas: the role of small-scale service providers in Maputo.



WATER

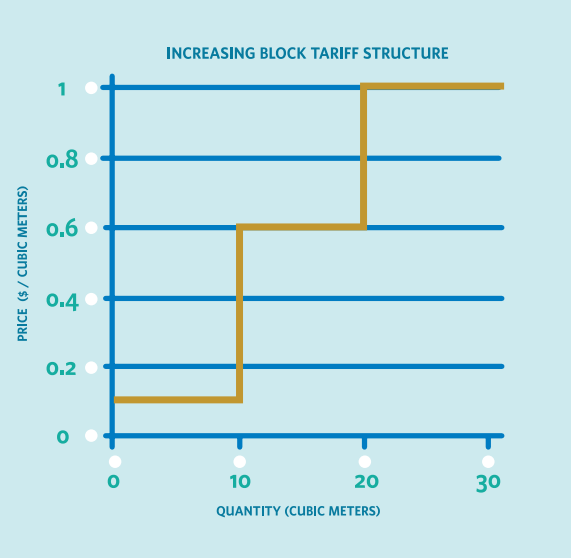
Setting water tariffs

The balance between affordability and sustainability

Setting consumer tariffs for WASH services requires a careful balancing act. Prices need to be affordable to low-income consumers, but at the same time high enough to place the service on a sustainable business footing. In the area of water service delivery, a common situation is for *per-litre tariffs* to be too low to achieve sustainability, while *connection charges* are too high for low-income households to afford. This leads to a vicious circle of distrust, with the residents of low-income communities making illegal connections to the network, and water utilities unwilling to invest in these communities because they anticipate very low revenues.

Breaking this circle requires the introduction of *pro-poor* tariff systems: systems that ensure both affordability for the poor *and* business viability for the utility. The solution sounds simple enough, but is easier said than done. For example, lobbying by influential industrial and commercial users may complicate negotiations. To influence decision-makers, implementers must use real evidence from surveys, and well-documented examples from other cities.

The most common pro-poor tariff is the Increasing Block Tariff (IBT) structure (an example is shown opposite). The lowest block represents the minimum acceptable service level (10m^3 per month in our example). When usage rises above this volume, the tariff increases to the second level until the next block is reached. The IBT assumes that low-income households will use less water than high-income ones , which is not always the case, but if used well the model should ensure that *all* households can access a minimum, affordable volume of water. To introduce IBT, willingness-to-pay surveys are first conducted in each location to assess the level at which each block (and the corresponding price) should be set. This must be done in consultation with all key stakeholders, ensuring that the tariffs are affordable for all consumers, *and* generate sufficient revenue for the water service provider to run the system and meet performance targets.



An implementer should expect to face political and institutional resistance when advocating for these changes – persistence is required!

Experience from Mozambique

Without access to the formal water supply, large low-income populations in Maputo pay high prices for low-quality water, sourced from informal suppliers. The city's water supply network is extensive, but many households do not connect because they cannot afford the connection charge imposed by the utility. WSUP advocated for a change to the tariff structure, proposing the introduction of an IBT and a separate tariff for those using privately operated standposts: these changes were adopted following lengthy negotiations with the regulator, the asset owner and the utility. The first block of the IBT is for consumption of up to 5m^3 per month; the price rises by about 30% for consumption between 5 and 10m^3/month, and then by another 25% for consumption over 10m^3/month. All domestic users also pay a monthly fixed tariff, known as the *social tariff*, providing a minimum volume of water at an affordable price. WSUP also advocated for the high connection charge to be lowered by 50% (with the option of staged payments over 12 months), and to waive the fixed monthly connection charge for standpost users.

Further reading

- Banerjee S and others (2010) Cost recovery, equity, and efficiency in water tariffs: evidence from African utilities. World Bank.

Reducing non-revenue water

A vital step towards commercial viability

Many water utilities in low-income cities struggle to provide water to all residents, with water production unable to meet growing demand. In this context, it is imperative that non-revenue water (NRW) be kept to a minimum. NRW represents the total amount of water produced by the utility for which no revenue is received. It comprises both *physical* losses (due to leaks and theft) and *commercial* losses (due both to unpaid bills and water that is incorrectly unbilled, because of poor metering or poor customer records). In some cities NRW can be as high as 90%, translating to a loss of millions of cubic metres of water per year: in other words, massive revenue losses for the utility and a hugely reduced volume of water available for supplying new customers. As a result, many residents (especially those in low-income districts) will continue to go without piped water, or will remain heavily reliant on community kiosks that provide water for only a few hours per day.

Introducing an NRW reduction programme can improve both the operational capacity and commercial viability of a utility. It can also 'free up' water resources that can then be used to improve supply in under-served areas such as low-income districts. WSUP recommends that an NRW-reduction programme should involve the following:

- Capacity building support to the water utility.
- Formation of trained leak detection teams.
- Division of the city into zones or DMAs (District Meter Areas).
- Management training for the utility's supervisors.
- Ensuring the utility has equipment for leak detection and pressure management.
- Support to the utility in improving their customer database and billing systems.
- Network improvements.

A citywide NRW reduction programme will involve strengthening processes across the whole utility: all staff can contribute to reducing NRW, not just the engineers!

Experience from Kenya, Mozambique and Madagascar

Nairobi (Kenya)

As a result of WSUP's collaboration with Nairobi City Water and Sewerage Company (NCWSC), NRW was reduced from 95% to 75% over a period of six months in the project area. Network improvements increased the quantity and quality of water available for approximately 5,000 consumers, and the initiative contributed to the establishment of a NRW Department and a citywide NRW programme.

Maputo (Mozambique)

NRW was reduced from 55% to 48% over a two year period in the project area, and average continuity of supply increased from 8 to 16 hours per day. An increased focus on NRW resulted in the establishment of a dedicated Leakage Losses Department within the utility.

Antananarivo (Madagascar)

The WSUP programme significantly improved the quality of water services, particularly with regard to water pressure and continuity of supply (which increased from just 3 or 4 hours per day to 24 hours per day). The programme also raised the priority of NRW within JIRAMA, the water utility, leading to the development of an urban NRW reduction strategy at the national level and establishment of a dedicated Leakage Reduction Unit for Antananarivo.

Further reading

- IWA (2003) Assessing NRW and its components - a practical approach.
- Asian Development Bank (2006) The issues and challenges of reducing non-revenue water.
- WSUP (2011) Can NRW reduction programmes lead to improved services for the poor? Practice Note 5.

Delegated management

An effective pathway to improved water services

Utilities face a range of logistical, administrative and political challenges in expanding their services into low-income urban areas. To help service these areas, one solution is for the utility to *delegate* service provision to local operators, including private companies, NGOs, CBOs, User Associations or Water Trusts among others. The local operator may obtain water from the utility network or from a local source (for example a borehole). Within served areas they can supply household connections, shared standpipes or commercial kiosks; and they can take responsibility for billing, revenue collection and maintenance. Importantly, each contract defines the area that the delegated operator is responsible for serving.

Delegated management offers an effective approach for serving low-income areas, but only if a number of barriers are overcome. Because of low technical capacity and low financial capital, delegated operators can be risk-averse, unwilling to invest in expanding their network. Introducing a new contractual arrangement to a utility can require committed advocacy, and may involve reversing decades-old institutional processes. To help convince the utility of the value of delegated management, WSUP recommends using *demonstration projects* (see page 20). It is important to provide technical and capacity building support to *both* the utility *and* the delegated operator. An effective delegated management arrangement should have these characteristics:

- The contractual arrangements are well defined and clear about ownership, management, operation and maintenance responsibilities.
- The utility understands the benefit for them: reduced non-revenue water and an increased customer base, leading to increased revenue.
- There are financial incentives in place to encourage the delegated operator to improve performance.
- The delegated operator is locally centred and 'close' to their customers.
- The system is financially sustainable with affordable consumer tariffs.
- The regulatory and policy regime is supportive and protects the interests of utility, operator and consumer.

Delegated management models need to be based on clearly defined contracts which ensure benefits for all parties (consumer, local operator and utility).

Experience from Kenya

Before WSUP began work in Naivasha, low-income communities outside the range of the water utility paid a high price for poor-quality water, supplied by local donkey cart vendors. In response, WSUP developed an innovative delegated management model for water service delivery, which provided a legally structured relationship between the different water supply actors. Under a *signed agreement*, the utility authorises private borehole owners to sell water in bulk to small private operators, at a specified tariff. In turn, operators are obliged to purchase their raw water from specified borehole operators, and to manage distribution through their local network to household connections and kiosks. The model has become widely recognised in the water sector in Kenya, and has influenced the management arrangements for water supply projects in Nairobi.

Further reading

- WSP (2009) Improving water utility services through delegated management.
- WSUP (2011) Business models for delegated management of local water services: experience from Naivasha (Kenya). Topic Brief 2.
- WSUP (2012) Delegated management of water and sanitation services in urban areas: experiences from Kumasi, Ghana. Topic Brief 3.

Improving water quality

Ensuring water is safe to drink

Urban WASH programmes typically value *access* to water over improved water *quality*. A plentiful supply of low-quality water, if safe to drink, is more beneficial to households than a limited supply of highly treated water. WSUP programmes reflect this focus, and prioritise improving access through the provision of better infrastructure and capacity building initiatives.

However, where water quality testing indicates that water supply is *not* safe to drink, the programme *must* improve both water quantity and water quality, even if this increases the cost of the intervention and leads to higher prices for the consumer. For example, this need occurs in many locations worldwide where fluoride levels in groundwater are dangerously high. Ingestion of fluorides in drinking water can cause dental and skeletal fluorosis, organ damage, and cancer, and the results of long-term exposure are irreversible. The problem is made harder to address because excess levels of fluoride are not evident in the taste, smell or colour of the water, and are not removed by boiling. This means the benefits of defluoridated water are not immediately obvious to consumers, who may continue to use cheaper untreated water. So provision of defluoridated water needs to be combined with community education on the risks of consuming untreated water, and the benefits of switching to the improved supply.

In some locations, improvements to water quality are ***essential*** in order to prevent negative health impacts from consuming unsafe water.

Experience from Kenya

Water quality tests of boreholes in Naivasha (Kenya) found fluoride levels ranging from 6 to 25 mg/litre, in excess of the WHO recommended guideline limit of 1.5 mg. In response, WSUP's Naivasha programme introduced fluoride removal at water kiosks, using a process in which the water is filtered through locally produced bone char (processed animal bones). Each kiosk now sells both general-purpose water for washing and hygiene (at US$ 0.01 for 20 litres), and defluoridated water for drinking and cooking (at the slightly higher price of US$ 0.02 for 20 litres).

The higher price of defluoridated water reflects the cost of the treatment process and the aim of financial sustainability. Nonetheless, this higher price has not been fully accepted: an evaluation study two years after kiosk construction found that one third of kiosk users only buy general-purpose water, mostly because they view defluoridated water as too expensive. This highlights the need for ongoing community education about the health risks of fluoride.

Further reading

- WaterAid (2011) Water quality standard and testing policy.
- WSUP (2011) Business models for delegated management of local water services: experience from Naivasha (Kenya). Topic Brief 2.

SANITATION

Communal toilets

A practical solution for high-density settlements

Individual household toilets are clearly preferable to communal or public toilets, especially for women and children: their advantages include a stronger sense of ownership, more privacy, and better safety. But in high-density settlements, where people often live as tenants in very small single-room dwellings, individual household toilets may not be possible. In these environments, providing a communal toilet shared by a group of households will often be the best solution. Communal toilets (sometimes referred to as 'shared toilets') should generally serve a small defined group of households, with no more than 15-20 people 'per seat'. In communities with serious night-time security issues, the toilet should be located within a locked compound, so that women and children can use them at night.

How to finance capital costs?

Financing the capital costs of communal toilets is challenging: users are typically *tenants* who are unable and/or unwilling to invest; *landlords* will often be unwilling to invest unless obliged to do so; *municipalities* generally don't have the resources to build enough communal toilets to meet demand. So what are possible solutions?

- **Solution one:** Develop financing models in which capital costs are supported by *both* users *and* the municipality. In these cases, the toilet is owned by the municipality and operated by a user group. In order to encourage cash-strapped municipalities to invest in communal toilets, a *demonstration model* should be considered. For example, the implementing agency could meet the full capital cost of a first pilot block; then, having demonstrated the benefits of the model to the community and the municipality, the implementer is positioned to advocate for mixed financing of future blocks, with users contributing perhaps 5-10% of the capital cost, and the municipality perhaps 20-50%.
- **Solution two:** Develop financing models based around *landlord investment*. In WSUP's programmes in Kenya, for example, communal toilets are built on landlord-owned land, after negotiation of a cost contribution from the landlord. There is a risk that landlords will invest but then introduce very high rent increases, driving out the original tenants, or sequester a donor-supported toilet for their own personal use. But these risks can be minimised with careful project design and good community liaison. Ideally, of course, there should be well-enforced regulations to *oblige* landlords to provide good-quality sanitation facilities for their tenants, at their own cost.

Users prefer communal toilets that serve a ***small*** group of households and that charge a monthly per-household fee (***not*** a payment for each use).

Experience from Mozambique

In early work in Maputo, WSUP supported construction of ten multi-service blocks containing toilets, showers and laundry stands; each serves between 15 and 55 households within a defined compound. The blocks are owned by the municipality but managed by user groups, who collect a monthly per-household fee. The user groups receive guidance to ensure that the fee is sufficient to cover operation and maintenance costs, and at the same time affordable for the poorest members of the community. Toilet cleaning is carried out either by the users themselves on a rota basis, or by a toilet attendant employed by the user group.

WSUP's experience has been that toilets of this type need continued support. Regular monthly visits help users to resolve problems, and generate feelings of obligation (*"how embarrassing: let's make sure the toilet is clean next time!"*). In addition, and despite revenue collection by the user group, financial support may still be required to keep the facilities in good condition in the longer term.

Further reading

- WSUP (2011) Financing communal toilets: the Tchemulane project in Maputo. Practice Note 2.
- WSUP (2011) When are communal or public toilets an appropriate option? Topic Brief 1.
- WaterAid (2010) Communal toilets in urban poverty pockets.
- WSUP (2013) Hybrid management models: blending community and private management. Topic Brief 9.

Pay-per-use public toilets

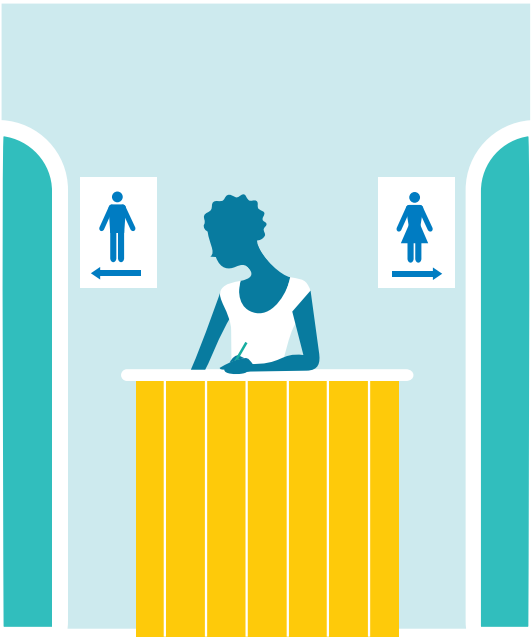
Better service quality through private management

Public toilets are found worldwide in places such as railway stations, bus stations and markets, and are open to anybody. They may also sometimes be installed in residential areas, or in hybrid locations serving both residents and people passing through (for example, in a low-income community bordering a market). Because so many people use them, people generally feel less *ownership* of a public toilet than users of household or communal toilets. These reduced feelings of ownership can cause problems with operation and maintenance, and with financial sustainability.

The private management of public toilets can help to make them more sustainable. In these cases, a user group or private operator is appointed by the asset owner (a utility or the municipality) to manage the public toilet. Typically there will be a tariff for each use of the toilet, though sometimes there may be a monthly payment system. To ensure the sustainability, WSUP recommends the following steps:

- Begin with a detailed assessment of demand and *willingness-to-pay* in the area of intervention.
- Secure a significant *contribution to capital costs* from the local community, municipality or private sector.
- Remember the importance of *location* – the siting of the toilets will have a major impact on levels of use. It can be helpful to locate the toilets in units offering other facilities, such as drinking water, showers or laundry stands (or even mobile phone or shoe-shine services).

Privately managed public toilets can be an excellent solution for locations like bus stations and markets, but for low-income residential areas WSUP would generally recommend communal toilets, with a defined group of users paying a monthly charge (see page 32).



Appropriate regulation by the municipality or other authority is critical in order to achieve the correct balance between service quality and tariff charged.

Experience from Madagascar

WSUP has supported installation of pay-per-use public toilets in Antananarivo, both in high-traffic public locations and in lower-traffic residential areas. The municipality owns the toilets, but local Water User Associations (WUA) have been established to manage the facilities; each WUA employs an attendant to take payments and to clean the toilets. The attendant keeps accurate records of the daily number of visits of different types (urination, defecation, or shower; man, woman, or child): this provides very strong data for evaluation of performance and ongoing planning.

The detailed records kept in Antananarivo confirm that where a block is well located, demand for defecation use is high and the revenues generated are sufficient to cover desludging costs. The toilets have worked best in high-traffic public locations.

Further reading

- WSUP (2011) When are communal or public toilets an appropriate option? Topic Brief 1.
- WSUP (2013) Hybrid management models: blending community and private management. Topic Brief 9.
- *See the IkoToilet concept at http://ecotact.org/ecoweb/*

Supporting private pit-emptiers

Developing safe and affordable FSM services

Piped sewerage systems are rare in low-income urban communities: most households have *on-site* sanitation facilities (commonly pit latrines or septic tanks). Management of sludge accumulated in these facilities is complex, and presents a serious problem in most low-income cities. Mechanical desludging by private operators is expensive for the consumer and in dense urban slums it is often impossible for desludging tankers to access pits. Municipal services for dealing with the waste are generally limited or non-existent so many pits are abandoned when full, posing a huge danger to the health of local residents. Any pit-emptying that is carried out is typically done by unskilled, informal workers. The work is often performed at night, when the faecal waste can be tipped into local water bodies or on open land (again placing the pit-emptiers and the local population at risk).

So supporting pit-emptiers to improve their services is a key step in achieving improved sanitation at city scale. A programme may work with self-employed pit-emptiers, and/or with local small businesses. In both cases the aim must be to develop and expand the business, but ensuring that the services provided are both *affordable* for low-income households and *safe* in terms of public health. A typical intervention should include (a) building the capacity of pit-emptiers through training on safe working practices and safe disposal; (b) supplying appropriate tools and protective clothing; (c) providing start-up finance and business management support; and (d) agreeing appropriate consumer tariffs. In addition, the programme will typically need to work with the local agencies responsible for sanitation, and to advocate for changes to local laws, policies and strategies around FSM. The private services will need to *interlock* with city-level infrastructure (e.g. neighbourhood sludge transfer stations) and it should be agreed that the municipality or utility will retain overall responsibility for management of the city's sanitation waste treatment and disposal.

The consumer tariff charged by the provider must be ***affordable*** for the local community, and ***viable*** for the business.

Experience from Zambia

Kanyama is a peri-urban area in the south of Lusaka, where 95% of households own pit latrines. WSUP found that 85% of these households (over 26,000 households in total) had never emptied their pits, which are often abandoned when full. Flooding during the rainy season is common, causing many pits to overflow into the local environment, and posing huge health risks to local residents.

To address this problem, WSUP supported Lusaka Water & Sewerage Company (LWSC), the mandated local utility, to introduce FSM services in Kanyama. Teams of pit-emptiers were assembled and provided with tools and safety equipment. In addition, a new biodigester was constructed where the removed sludge could be transported and treated, generating a safe compost and biogas as end-products. The tariff charged to consumers is linked to the amount of sludge they want removed from their pit: this means customers can choose an appropriate level of service depending on how much money they have available.

The pit-emptying service was introduced in February 2013 and has already reached nearly one thousand people. The service has been well received, partly because the local community consider the tariff affordable. Through further community sensitisation, WSUP and LWSC expect that additional households will benefit from this safe and sustainable FSM service.

Further reading

- Eales K (2005) Bringing pit emptying out of the darkness: A comparison of approaches in Durban, South Africa and Kibera, Kenya. BPD Sanitation Partnerships Series.
- Water For People (2012) The role of Business Member Organizations in supporting sanitation entrepreneurs in Uganda, Rwanda and Malawi.
- WSUP (2013) Achieving sustainability: guiding entrepreneurs to independence. Practice Note 12.

Sanitation marketing

Stimulating supply and demand

In low-income cities, stimulating the supply of and demand for sanitation services requires determined effort. Demand is often very low at the start of a programme, as many households will not consider sanitation a priority. Suppliers (such as entrepreneurs) are likely to be risk-averse, and cautious about getting involved unless there is clear financial benefit.

Sanitation marketing offers a way to overcome these difficulties, and to build supply and demand for sanitation products. On the demand side, a campaign should start by identifying a target population and working to understand their motivations as potential consumers, and their willingness to pay for sanitation products. On the supply side, the campaign can use private sector experience to develop and promote toilets and toilet-related products. It is important to note that entrepreneurs may be inexperienced in business development, and may need financial backing to support increases in their stock levels.

Sanitation marketing campaigns require sufficient financial resources and considerable time to implement promotional activities. WSUP recommends that a sanitation marketing approach should include:

- Involvement of the existing supply chain providers in developing the marketing strategy.
- Mass media communication and household visits to increase demand for products.
- Flexibility in the range of sanitation products to meet the needs expressed by different users.
- Transparent financing schemes to enable low-income households to access credit, for example through the use of revolving funds.
- Regular monitoring and evaluation of the campaign to assess effectiveness, and continual adjustments to the strategy to improve supply and demand.

Sanitation marketing is a very powerful tool, but targeted subsidy may still be required to reach the poorest of the poor in a given community.

Experience from Madagascar

Many low-income families in Antananarivo use basic pit latrines, which require a concrete 'SanPlat' slab to make them hygienic. However, the cost of SanPlats makes them unaffordable for most low-income families, who do not see improved sanitation as a priority investment.

In response, WSUP implemented a sanitation marketing campaign which addressed both the demand and supply sides of the SanPlat chain. Demand was stimulated through a hygiene-focused communication campaign. The supply chain was triggered by providing training and start-up support to groups of masons to manufacture SanPlats, and by supporting retailers to stock the product. A key market stimulant was the creation of *revolving funds* with WSUP support, managed by local CBOs. The funds enabled households to access a small loan (approximately US$8) to purchase the SanPlat, and then repay it within a few months.

The sanitation market is now embedded in the focus communities, with about 2,000 SanPlats sold and a sustainable supply-chain established.

Further reading

- WSP (2011) Introductory guide to sanitation marketing.
- WSUP (2013) Getting to scale in urban sanitation. Topic Brief 11.

When is sewerage the answer?

Sewerage solutions for low-income communities

Can sewerage be a cost-effective sanitation solution for low-income urban communities? Or should efforts focus on improving non-networked sanitation? These are controversial and difficult questions! Politicians may often favour universal sewerage of towns and cities, without fully understanding the very high levels of investment required; while donor agencies may often reject sewerage entirely, even in contexts in which it is the most appropriate solution.

WSUP recommends a balanced approach, based on the following principles:

- For most low-income urban communities, sewerage will *not* be financially feasible over medium-term planning horizons, so that institutions and donors *must* support non-networked systems (i.e. high-quality non-sewered toilets, with safe discharge of any liquid effluent, and genuinely effective systems for removing, transporting and treating/reusing faecal sludge).
- However, particularly in settlements with high population density, sewerage *may* be an appropriate solution: this is especially the case when low-income settlements lie within reach of existing sewer mains.
- When sewerage is selected as the appropriate solution for a low-income settlement, there needs to be *very careful attention* to system design, as detailed in what follows...

Sewerage is not just about laying sewer lines into the community; this needs to be accompanied by high levels of connection. To mitigate the risk of low take-up, a strategy for mobilising connections should be established at the outset.

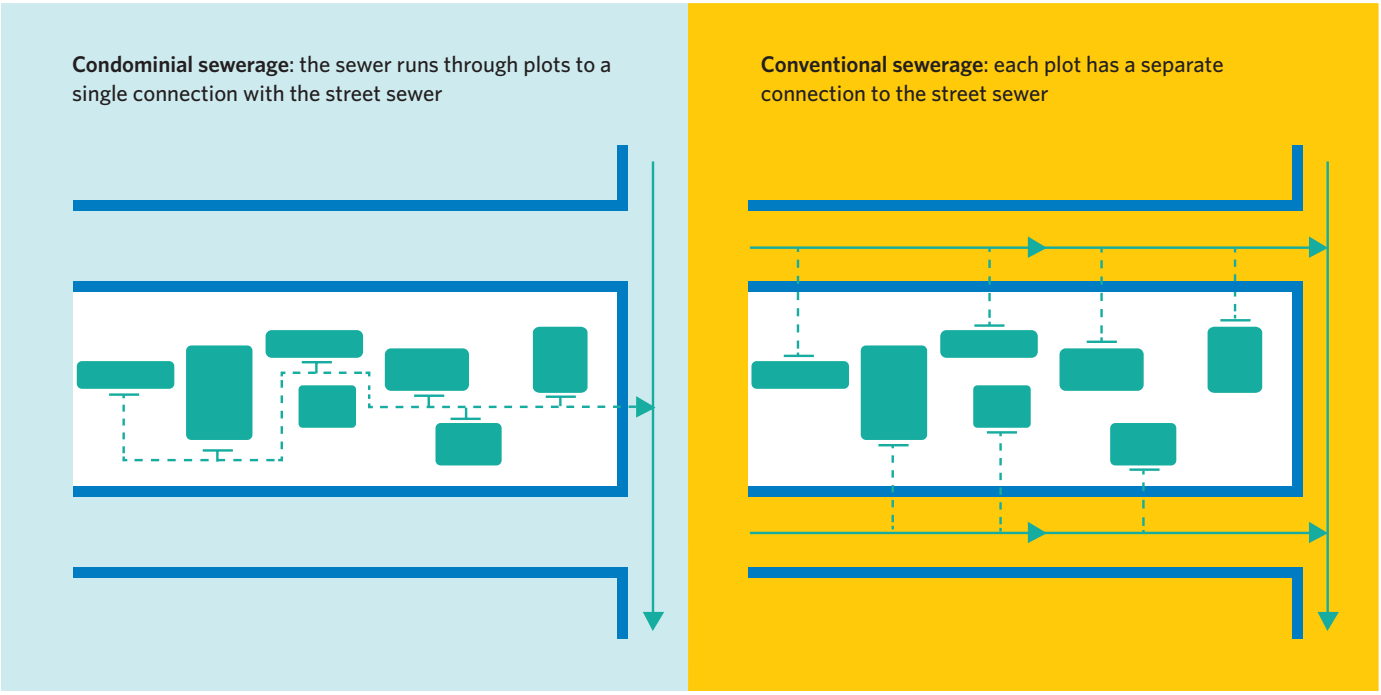
Key recommendations for sewerage of low-income communities

1. Consider diverse design modifications to ease operation and reduce investment costs, including for example a) use of rationalised network layouts ('condominial' layouts), b) narrower pipes laid at shallower depths, and c) smaller and/or less frequent inspection chambers.
2. Consider use of liquids-only sewerage ('settled sewerage'), rather than conventional solids-transporting sewerage: this means that toilets empty first to a septic tank which retains the solids, and only the liquid component enters the sewer.
3. Consider first focusing on connecting communal and public toilets only (sewer connections for individual households can come later).
4. Consider systems in which sewerage is integrated with improved FSM services: for example, consider systems for controlled tipping of fresh faeces or older sludges into the sewer network, as in the Nairobi case study on page 37.
5. Pay very careful attention to achieving *high rates of connection*. This can be done through pre-negotiated community commitments; through social education and marketing; through carefully designed and targeted subsidies; and possibly through regulation to oblige householders (or at least landlords) to connect.

Regarding point 5, always remember that it is not easy for households to connect to the sewer line. Connection may require the householder (or landlord) to invest in a new pour-flush toilet, *and* lay a pipe from the toilet to the plot boundary, *and* lay a pipe from the plot boundary to the sewer... if this is liquids-only sewerage, the householder may also have to pay for a septic tank. This can lead to very substantial costs, and many householders/landlords may not be able or willing to pay. In summary, when costing and planning sewerage systems for low-income communities, *don't* expect households to automatically connect - sewerage projects in low-income communities often fail because these difficulties are not properly taken into account.

Further reading

- Melo J (2005) The Experience of Condominial Water and Sewerage Systems in Brazil: Case studies from Brasilia, Salvador and Parauapebas.
- NCWSC/AWSB (2009) Strategic Guidelines for Improving Water and Sanitation Services in Nairobi's Informal Settlements.
- *See also diverse publications by Duncan Mara.*



The difference between high-cost conventional sewerage and the lower-cost 'condominial' alternative.

Experience from Kenya

In the densely populated neighbourhood of Kibera (Nairobi), many people live in compounds of 10-20 rooms sharing the same toilet. The very poor sanitation conditions (including plastic bag defecation) are particularly shocking given that several main sewer lines run through Kibera, but no-one is connected. So under the USAID-funded ACF programme, WSUP worked with Nairobi City Water & Sewerage Company (NCWSC) to extend sewers from these main lines into parts of Kibera. WSUP did not expect individual households to connect: instead, the project aimed to construct and connect communal toilets and pay-per-use public toilets. To mitigate against delays in connection, WSUP developed a hybrid FSM/sewerage model, with the sewer-connected septic tanks of the public toilets serving as local disposal points for sludge collected by local pit-emptiers.

- Surveys carried out since 2012 have indicated that about 90% of the sewer-connected communal toilets constructed under the first phase of this programe are functioning well.
- However, only about 50% of these communal toilets are being made readily available to tenants: in the other 50% the landlord was charging abusive amounts, or sequestering the toilet for their own private use.
- Under the continuing second phase of this project, WSUP is working with NCWSC to encourage landlords to upgrade existing communal toilets (from pit latrine to pour flush), connect to the sewer, and make the toilets freely available to tenants. WSUP is providing some subsidy support towards the cost of connection (typically about $90).
- Local pit-emptiers are emptying sludge into the sewered septic tanks of the public toilets, supporting the development of more affordable and safe pit-emptying services within these areas of Kibera.

Of course, Kibera is an unusual case: most slums in African and Asian cities don't have main sewer lines running through them already! But this gradual hybrid approach to sewering slum communities (start with communal and public toilets, and integrate with pit emptying) may have wider application elsewhere.

Human-centred sanitation technologies

Innovative ways to address the urban sanitation challenge

A common approach to urban sanitation is the promotion of different types of 'improved' latrines, designed by engineers. Though a catalogue of such options remains valuable, WSUP has found that such 'traditional' solutions are not always appropriate. Where these approaches are failing to gain momentum, an alternative strategy might begin by asking *what do people really want?*

Often, the answer is that people want a smart flush toilet in their own home. Of course, most low-income inhabitants of African and Asian cities cannot afford a sewer-connected ceramic toilet, but innovative technologies may be able to meet this aspiration. WSUP has based initiatives in this area around human-centred design approaches, which help explore aspirations and market potential in the local context. Human-centred design involves seeking insights into people's sanitation needs, treating their aspirations as centrally important, involving the target consumer in product pilots, and getting their feedback. These approaches benefit from the involvement of the private sector, whose skills in product development and marketing can help take the chosen solution to scale.

The chosen sanitation solution must be affordable and desirable, and must directly address the needs of local people.

Experience from Ghana

Sanitation coverage in the densely populated slums of Kumasi is very low; many people have no household toilet and use very unhygienic public facilities. In response, WSUP is trialing a sanitation business joint venture, known as Clean Team, with Unilever and the design and innovation organisation IDEO.

Four toilet prototypes were designed and tested, and feedback was then gathered from a number of families to understand customers' preferences about maintenance, pricing and branding. A domestic urine-diverting cartridge toilet service was selected as the preferred option (see illustration above). The most popular pricing option is US$ 11.50 per month, including twice-weekly emptying; this compares with up to US$ 30 per month for public toilet use by a five-person family.

Initial trials show very positive user responses, and confirm that many low-income householders in Kumasi are able and willing to pay for this service. At current pricing the service is not yet reaching the poorest of the poor, but we expect that pricing reductions over time and lower-cost service delivery innovations will resolve this.

Further reading

- WSUP (2012) Clean Team, a human-centred approach to sanitation: initial trials in Ghana. Practice Note 8.
- *For more information about human-centered design processes: visit www.hcdconnect.org*

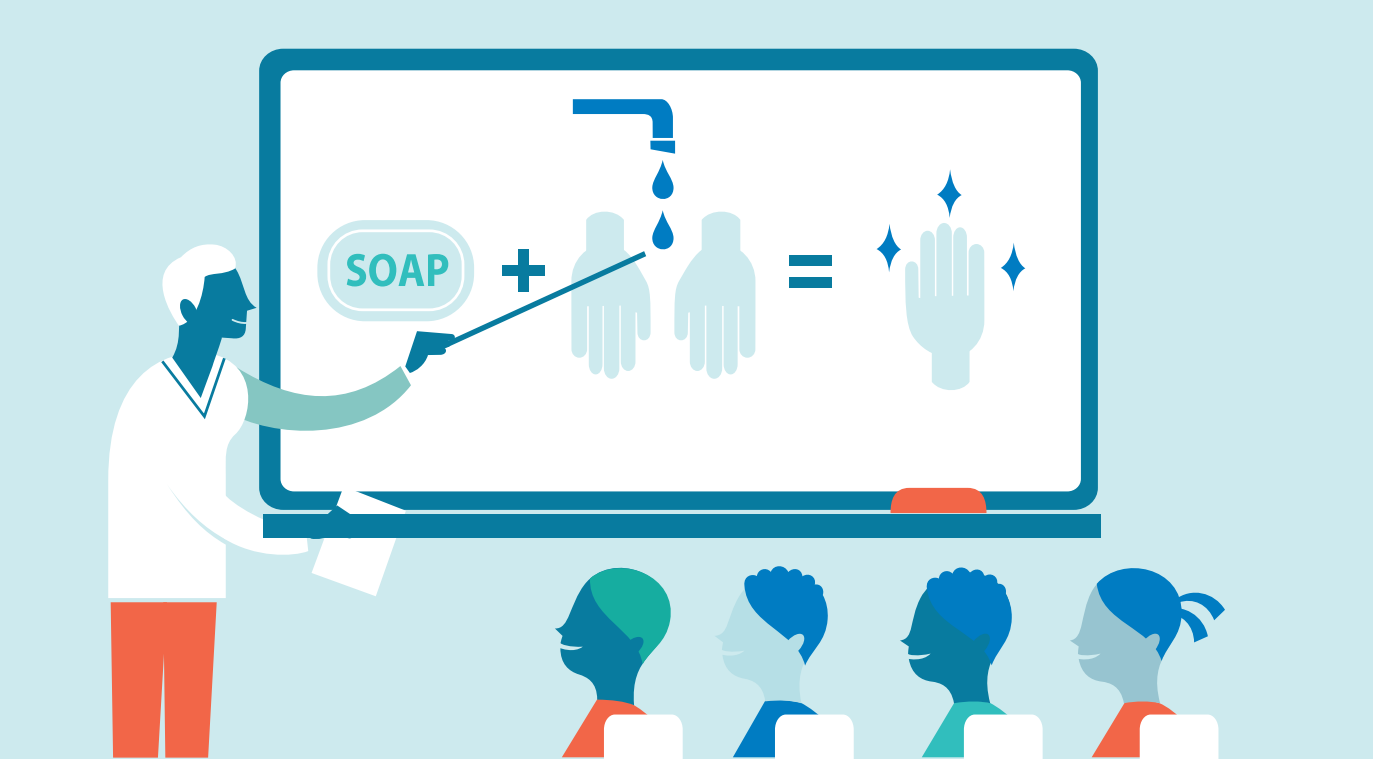
HYGIENE BEHAVIOUR CHANGE

Handwashing promotion

Helping to secure better health outcomes

Most urban WASH programmes have a direct or indirect focus on providing better sanitation facilities and improved water supply. Physical infrastructure is a necessary step to raising living standards for the residents of low-income communities, and to the end goal of achieving better health outcomes. But infrastructure alone is not enough: an integrated programming approach also requires behaviour change to ensure a lasting improvement to people's lives. This includes mobilising communities to invest time and resources in the maintenance of new or existing facilities; and promoting hygienic behaviours such as handwashing that are essential to improved health.

Hands that have been in contact with faeces and other bodily fluids can transport large numbers of viruses, bacteria, parasites and pathogens. This leads to the transmission of diseases such as diarrhoea and respiratory infections, the biggest killers of young children in developing countries. The simple act of handwashing breaks this transmission route. Regular handwashing is especially important in places where large numbers of people congregate (for example, in schools); where ill or vulnerable people are concentrated; where food is prepared and shared; and in home environments. A handwashing promotion campaign should emphasise the advantages of using soap, which breaks down grease and dirt (which contain the largest concentrations of microbes). Trials have shown that handwashing with soap is more effective than handwashing with water only, whilst the use of soap also results in fresh and clean-smelling hands, making the habit much easier to promote. In situations where soap is simply not available, other substances such as sand and ash can have some positive effect - but soap is always preferable!



Handwashing programmes in schools are very effective because children take the handwashing message back home to adults. It is very important to ensure that teachers are trained and motivated to continue handwashing education in the longer term, helping the children establish behaviours that will stay with them for life.

Further reading

- WSUP/USAID (2012) African Cities for the Future, Annual Report No.3.
- Unilever (2012) Lifebuoy Way of Life: towards universal handwashing with soap: Social Mission Report 2010-2012.
- *See the WSP Handwashing With Soap Toolkit at https://www.wsp.org/hwws-toolkit/hwws-tk-home.*

Recognising the importance of handwashing with soap and hygiene promotion in general, we recommend that implementers include handwashing promotion components within WASH programmes. Below we detail three key aspects to consider when planning these activities:

Where and when will the intervention take place?

At the planning stage of a handwashing promotion intervention, the implementer should think carefully about where (in which schools or in which communities) and when the intervention will take place. If the goal is to conduct school-based handwashing promotion as part of an integrated programme, the activities should be conducted in schools within the same target geographical area as other water and sanitation activities. It also makes sense to do hygiene promotion activities after water and sanitation facilities have been improved, not before.

How to achieve scale: partnering with the local private sector and/or government departments

If approached in the right way, handwashing promotion activities present an opportunity to reach a large number of people very quickly. One option is to partner with the local private sector in order to capture their experience in soap marketing, whilst ensuring the approach is appropriate to the local context: for example, WSUP has successfully partnered with Unilever to deliver large scale hygiene promotion campaigns in Kenya (see experience section below), Ghana, Zambia and Bangladesh. Another option is to collaborate with relevant government departments (typically the departments of education and/or public health), to help encourage ownership of the campaign and replication in other districts/cities. In an example of the type of scale that can be achieved through these collaborations, WSUP is teaming up with the Ministry of Health in Zambia to deliver a behaviour change intervention in Lusaka in early 2014, expected to reach 300,000 through door-to-door visits alone. Finally, it is important to explore options for media engagement, both in reporting on the campaign and as part of the campaign itself: in the upcoming intervention in Zambia, hygiene promotion messages will be relayed through local media at a citywide level.

How to ensure sustainable outcomes

As with all WASH activities, the implementer must consider how sustainability can be achieved. It is great to tell people why and how they should wash their hands, but this is useless if the messages are forgotten within a few months! In a school-based intervention, a good option is to train one teacher in the school about how to communicate key messages; that teacher can then be made responsible for training the other teachers, ensuring there is buy-in from all staff, and that knowledge is not concentrated with one member of staff who might leave the school at any time. In some countries, handwashing will be a part of the formal curriculum (perhaps covered in a handful of lessons over the course of a year), but the children's learning will need to be reinforced more regularly than that, and over a long period: teachers or community leaders should be told to keep emphasising messages long after the primary intervention has been completed, for example in school assemblies or community meetings. Lastly, remember that people need both the knowledge and the physical means to wash their hands: sustainability of supporting infrastructure is essential! Schools and communities must be encouraged to invest in a regular supply of soap, and will need handwashing stations and adequate water supply so that people can practice their improved behaviours.

Experience from Kenya

In Nairobi, WSUP supported a branded handwashing promotion campaign to target children in primary schools, 50% of whom were in informal settlements. The campaign employed the Unilever Lifebuoy *School of 5* methodology using trained hygiene promoters and teachers to carry out promotion activities. The School of 5 method features memorable cartoon characters starring in comic books (distributed to the children), and on posters and other dissemination materials. The characters encourage children to wash their hands thoroughly with soap at least five times a day: three times before meals, during bathing, and after using the toilet. In addition, enrolment cards are used to help children make a 'pledge' to adopt these practices. As part of the WSUP intervention, handwashing stations were installed, and a local theatre group was used to spread the message in an engaging way. Approximately 20,000 pupils were influenced directly by this campaign and, because these pupils educated their peers and siblings in turn, it is estimated that a total of 33,276 people were reached. A large-scale School of 5 Handwashing Campaign was then launched in June 2012, featuring a famous Kenyan pop star as ambassador. The campaign covered 210 schools in the region and reached an estimated 150,000 pupils.

Promoting community-level behaviour change

Working towards clean neighbourhoods

Whilst programmes to improve access to water and sanitation coverage are important, they serve no real purpose if the new facilities are not used or poorly maintained. Similarly, if a new water point or toilet block in a low-income neighbourhood is set in a filthy environment, it is unlikely that any health benefits will be achieved.

So, improving sanitation and hygiene behaviours across the community is essential to ensure that maximum benefit is derived from new WASH facilities. However there are many different ways to promote behaviours, and experience has shown that identifying the correct context specific approach is critical to achieving sustained change. Careful planning and collaboration with local government, civil society and the target communities are all key parts of the process. In some locations the promotion of a single idea (e.g. handwashing – see pages 46-47) has provided a catalyst for the community to undertake wider changes, whilst in other locations a range of messages are conveyed, from the importance of safe water storage to improving environmental cleanliness.

The appropriate strategy to achieve community-level behaviour change will vary according to the local context and cultural norms. There are many possibilities, and the following are just examples:

- Develop campaigns to encourage local communities to clean and maintain *communal sanitation facilities*, and to keep *surface drains* free of garbage.
- Organise monthly neighbourhood *clean-up campaigns:* these could be targeted at market women and food vendors for example, and might involve a degree of competition (for example, a prize for the 'Cleanest Street').
- Work with local government *environmental health officers* to screen food vendors and inspect health certificates, and advocate for this to be performed as standard government practice.
- Organise events to ensure hygiene messages reach *young men* (a group sometimes overlooked in programmes that focus on women).
- Use *local media* and *message boards* in public places to raise awareness (for example in schools, markets, and bus stations).

Experience from Ghana

To complement water and sanitation infrastructure provision in Kotei, a peri-urban area of Kumasi, WSUP developed a programme-led behaviour change strategy. Its purpose was to raise awareness of safe hygiene behaviours, improve community cleanliness, and consequently to improve public health outcomes. The intervention demonstrates the breadth of activities that can be undertaken in a behaviour change campaign. First, training on hygiene promotion was provided to the Community Management Committee, public toilet attendants and market women, to ensure that the knowledge and skills to successfully bring about change resided within the local community. Hygiene promotion materials – including leaflets, posters and t-shirts – were then developed and delivered door-to-door within the community, specifically targeting food vendors and market women, together with demonstrations on proper handwashing with soap. Within schools, hygiene mini-billboards were posted, and a drama and poem competition was organised. Public announcements and video information shows were presented in and around the town, targeting both long-term residents and the transient community. Finally, Global Handwashing Day was celebrated through a demonstration of handwashing with soap in schools and a street procession of school pupils. It is estimated that a total of 18,250 people have been reached through the strategy.

Further reading

- WSP/Indian Ministry of Urban Development (2011) Rating of cities: National Urban Sanitation Policy - Frequently Asked Questions.
- WSUP (2011) Using water kiosk revenues to cross-finance environmental hygiene: Tana's RF2 model. Practice Note 1.
- WSUP/USAID (2012) African Cities for the Future. Annual Report No.3.

CROSS-CUTTING

The importance of gender in WASH

Embedding gender-inclusiveness in programme design

Women and girls suffer disproportionately from the effects of poor sanitation, poor hygiene, and inadequate access to water. Common gender-related issues include lack of privacy and safety when using communal toilets, and lack of consideration of menstrual hygiene. Unless explicitly addressed in siting and design, these issues can have a huge negative impact on the use of facilities and on the well-being of the women and girls affected.

Throughout the planning and implementation of any WASH programme, it is vital to assess factors that might lead to exclusion of women and girls, and to address these issues through an inclusive approach. For example, communications associated with the programme – ranging from hygiene education materials for communities to advocacy work with local government – should stress the importance of gender inclusiveness. Monitoring should pay particular attention to the use of facilities by women and girls, and ex-post evaluations should document learning in this area.

A gender-inclusive approach should be adopted both in communities and when working with local service providers. At the community level, this includes genuine participation of women in the design and siting of facilities, to ensure ease of access and use; and active participation in community management of WASH services. Within service providers such as utilities and municipalities, community development staff need to be trained in gender mainstreaming techniques.

The term 'gender inclusiveness' is mostly used to imply inclusion of women and girls, but a programme should also consider if ***'male-focused'*** approaches may be needed. Such approaches encourage men and boys to alter their attitudes towards gender (for example, disapproval of women's involvement in decision-making).

Experience from various countries

Menstrual hygiene: Women and adolescent girls living in low-income communities may be unable to clean their sanitary cloths/pads hygienically and privately during menstruation, leaving them vulnerable to skin diseases and infections. In Dhaka (Bangladesh), WSUP introduced a major hygiene campaign in partnership with CARE. The campaign targeted adolescent girls through sessions to promote menstrual hygiene and the formation of an Adolescent Girls Group, enabling participants to share experience, knowledge and effective coping strategies. In Maputo (Mozambique), focus group discussions revealed that women were reluctant to use communal sanitation blocks and latrines for menstrual hygiene, owing to the stigma attached to disposing of menstrual waste in public. Group discussions have helped sensitise communities to seek appropriate, practical solutions.

Menstrual hygiene management and faecal sludge management (FSM): The disposal of menstrual waste is a particular challenge in FSM projects. Embarrassment means that women often dispose of sanitary cloths, pads and rags in pits and septic tanks, making emptying more difficult. To address this, WSUP is working with community groups to improve pit use behaviours (Lusaka, Zambia) and installing menstrual waste incinerators attached to communal facilities (Naivasha, Kenya).

Working with men: A key theme emerging from WSUP's programmes is the need to proactively engage with men to support gender equity. For instance, in Maputo the identification and sensitisation of *male champions* is seen as a key step in the process of changing men's attitudes to both their own hygiene behaviours and women's participation.

Further reading

- WSP (2010) Gender in water and sanitation.
- WSUP (2014) A gender-inclusive approach in practice: communal sanitation. Practice Note 14.
- House S, Mahon T & Cavill S (2012) Menstrual hygiene matters. WaterAid.

Participation: In Naivasha (Kenya), WSUP developed Toilet Design Clinics as an aid to ensuring participation in the development of sanitation facilities. These sessions put the needs of women and girls at the centre of the planning process with an explicit emphasis on infrastructure design, siting and management. In addition to prototypes for menstrual health incinerators, the clinics also helped develop solutions to women's *safety and privacy* concerns. Sharing a communal cubicle with men caused discomfort for female users, so twin door latrines were identified as a solution; similarly, locking the cubicle at night and providing a key that is available only for community members reduced concerns about the threat of rape or sexual assault.

Women's empowerment: An important aspect of WSUP's approach is supporting women to take leadership positions in local committees: for example, Water User Associations in Naivasha (Kenya), and Community Sanitation Block Committees in Maputo (Mozambique). This work has helped to empower women in these locations and to ensure that local services continue to be responsive to women's needs. Empowerment can also be achieved by supporting women's economic development: in Maputo (Mozambique) women have been trained in standpost management, while in Naivasha (Kenya) women have been supported to join the traditionally male-dominated workforce constructing the new WASH facilities.

Water collection and availability: In areas where collecting water can take a long time, it will often take priority over schoolwork, resulting in poor academic performance and high school drop-out rates, especially for girls. Increasing the proximity of water supplies can shorten the time that girls spend collecting water and help to break down gender roles: in Naivasha, the WSUP programme has observed that men are more willing to collect water when water kiosks are closer to home.

Empowering vulnerable groups

How to achieve genuine inclusivity

WASH programmes aiming for 100% coverage often include a focus on tenants and the very poor. This is absolutely necessary and of course it is essential to make sure that the programme is beneficial for women and girls. But to make access for *everyone* a reality, it is essential to go further and to take specific measures to ensure access for *vulnerable groups*. This might include people with disabilities (PLD), people living with HIV (PLHIV), older people and sick people. Culturally appropriate interventions implemented by trained specialists are required to identify these groups and to empower them to voice their needs.

Why WASH services are so important for vulnerable groups

The need to provide services for vulnerable groups goes beyond questions of equality: for these groups the stakes are especially high, and access to WASH services can be critical for short-term life prospects. For example, a weakened immune system means people living with HIV and AIDS are highly vulnerable to infectious diseases, and it is vital for them to stay protected. Many of the most common infectious diseases, including diarrhoea, are more easily transmitted in areas with unclean water and low standards of sanitation. Good WASH services greatly reduce the risk of contracting infectious diseases, and provide a defence against worsening ill-health. This is in addition to other very important benefits. For example, a mother who is HIV-positive can avoid breast-feeding, which poses a risk of transmitting the virus to her infant, if she has clean water. Similarly, the standard of home care for PLHIV and PLD improves when family members have water sources close to home, greatly reducing the time they have to spend collecting water each day.

Identifying *local* barriers to access

In designing inclusive programmes, WSUP recommends first assessing the particular challenges faced by each group in using WASH services *in the programme area*, before devising strategies to overcome them. For PLD and PLHIV the barriers to accessing and using WASH facilities are considerable, and might include:

- *Natural environment* barriers (for example, a distant water standpipe will make it difficult for a person with impaired vision to collect water).
- *Infrastructure* barriers (for example, a narrow entrance or steps make it hard for a person with reduced mobility to access a latrine block).
- *Institutional* barriers (a lack of awareness and understanding amongst decision-makers can lead to the exclusion of PLD and PLHIV in programme planning and implementation).
- *Social* barriers (prejudices against PLD and PLHIV will further contribute to their exclusion and sense of isolation).

Social stigmas can mean that households ***hide*** the fact that a family member is living with a disability or HIV so it is important to work closely with community members to identify these individuals and to enable their participation.

Further reading

- von Münch E (2011) Making sustainable sanitation inclusive for persons with disabilities. GIZ.

Experience from Mozambique

In Maputo it is estimated that 5% of the population live with some kind of physical or mental disability. In the WSUP programme area, inadequate water supply and the poor state of household latrines means that most PLD and PLHIV are not able to go to the toilet in comfort. As most do not have a tap at home, they have to spend time and money buying water from neighbours, creating a reliance on others that impacts on their personal dignity.

To address this situation, WSUP worked in partnership with the Mozambican Association of Women with Disabilities to raise awareness of the issues affecting PLD and PLHIV in the local community. Work was conducted to ensure these groups were represented in all WASH-related community meetings. Their active participation was encouraged in the planning, design and management of new infrastructure. A significant achievement was the inclusion of a woman living with a disability (Anatércia Francisco Santo) on the management committee of a communal sanitation block. Through participating alongside other community members in a training programme on operation and maintenance, Anatércia was able to overcome her fear of discrimination.

Efforts to empower vulnerable groups in these communities have been combined with improvements to the accessibility of new infrastructure. Under the WSUP programme, 23 community and school sanitation blocks were adapted to be accessible to PLD and PLHIV.

Building entrepreneurship

Supporting small and medium enterprises (SMEs)

The importance of providing support to large service providers, such as utilities and municipalities, is well understood by WASH practitioners. Nonetheless, these institutions may currently be unable to provide adequate WASH services to all low-income communities in the city. Stepping in to fill this gap, *local entrepreneurs* emerge as an alternative for serving low-income consumers: though these entrepreneurs too will have barriers to overcome. In the first instance, the services they provide are often unregulated, unauthorised and varying in quality. Poorly defined institutional accountability, corruption and disagreements over land tenure result in conflicts between entrepreneurs, between entrepreneurs and the institutions, and between entrepreneurs and consumers. All of these conflicts further reduce the quality of services.

An effective WASH programme should work to remove these barriers, and to improve the environment within which local entrepreneurs operate. On the one hand, this means *supporting entrepreneurs* with capacity development and start-up finance. Equally, it means *working with institutions* to (a) improve the regulatory framework and provide the entrepreneurs with clear guidelines for complying with local laws; and (b) update policies and strategies to reflect the reality in any given location. WSUP recommends this two-pronged approach in order to create incentives for entrepreneurs to develop their business and make profit, but at the same time to work within a regulated, supportive environment in which they can contribute to effective citywide services.

At the outset entrepreneurs may be risk-averse and cautious about participating in WASH interventions. However, providing targeted ***technical, management and financial support*** can help overcome these fears, and agreeing ***performance goals*** can also create buy-in.

Experience from Mozambique

An estimated 56% of Maputo's population depends on *on-site* sanitation (usually pit latrines). Yet until recently, no safe emptying and transport services for faecal sludge were available to these residents: latrines stayed unemptied even when full, posing a high risk of overflow to the local environment. In response to this problem, WSUP initiated a pilot project to help an established local solid waste management business (UGSM) expand into household pit-emptying. With the aid of a Professional Services Agreement with WSUP, the business has successfully diversified, and has established a strong relationship with the Municipal Council. A transfer station for sludge disposal is under construction, set to reduce UGSM's transport costs and therefore the price of the service for its low-income customer base. As part of the next stage of capacity development, WSUP is providing training for a Junior Manager to help with UGSM's accounting.

Further reading

- WSUP (2011) Business models for delegated management of local water services: experience from Naivasha (Kenya). Topic Brief 2. (Naivasha case study).
- WSUP/USAID (2012) African Cities for the Future, Annual Report No.3.
- Water For People (2012) The role of Business Member Organizations in supporting sanitation entrepreneurs in Uganda, Rwanda and Malawi.

FREQUENTLY ASKED QUESTIONS: FAQs

1) How should interventions be *prioritised* and *sequenced*?

As noted in the Introduction (see pages 2-3) this is a *rapid-reference guide* organised around individual topics. But of course when you design a programme you will need to *prioritise* certain types of solution (you won't be able to do everything in this guide!), and *sequence* individual solutions into a coherent plan. In order to make informed decisions about which types of solution to implement, you first need to get a detailed understanding of the local situation, including the current level of service provision and available capacity.

2) Who needs to be consulted?

When planning an urban WASH programme, it is *critically important* to consult with a wide range of stakeholders. This includes organisations directly involved in WASH service delivery (utilities, municipal authorities, the private sector, etc.), as well as diverse other relevant actors including civil society organisations, urban planning authorities, education authorities, and religious leaders. And evidently, you need to listen very carefully to *the people in the target populations*, including women and members of vulnerable groups (see pages 40-43).

3) What exactly is a urban low-income community?

Urban LICs are neighbourhoods in which a high proportion of households live in poverty. They are often characterised by poor-quality housing, insecure tenure and high population densities; by high unemployment and low-incomes; by low levels of access to basic services; by high levels of child disease and child mortality; and by low average life expectancy. Many LICs are *informal* (i.e. not formally authorised) and/or *peri-urban* (i.e. not within the formal administrative boundaries of the city): but WSUP certainly considers that such LICs should be targeted for service improvements.

4) What exactly are 'improved' services?

Definitions of 'improved' vary: readers should consult the definitions used by the WHO/UNICEF Joint Monitoring Programme (http://www.wssinfo.org/), in relation to both the Millennium Development Goals to 2015, and the Sustainable Development Goals post-2015. In practical terms, WSUP considers that *improving water services* means improving the quantity, quality and affordability of water supply for drinking and for other domestic uses; *improving sanitation services* means improving the collection, transport, treatment and disposal/reuse of human excreta, so that both houses and streets are uncontaminated by human faeces; *improving hygiene* means improving behaviours and measures (notably handwashing) that break the chain of infection transmission in the home and in the community.

5) How long does a typical urban WASH programme last?

Typically, an urban WASH programme funded by an external donor might last between 1 year and 5 years. But ensuring that a programme's interventions are effective and sustainable requires time (for planning, for stakeholder consultation, for capacity development, for behaviour change...). One- or two-year programmes may not provide sufficient time to do things sustainably, and WSUP would always argue for longer programme durations where possible.

6) How much does a typical urban WASH programme cost?

How long is a piece of string! The cost of an urban WASH programme is influenced by a number of variables, including the scope of programme activities, the number of people targeted, programme duration, and local labour and materials costs. The budget for a WSUP programme within a single city might range from US$ 100,000 (for a limited set of activities within a wider programme) to US$ 10 million (for a major 3- to 5-year programme). Full at-scale improvement of WASH services throughout a large city would be expected to cost hundreds of millions of dollars.

7) Which organisations provide funding for urban WASH programmes?

The most important and sustainable source of funding for urban WASH programmes is *local and national government*: long-term at-scale improvements are not achievable without government investment! The main external funding of urban WASH programmes comes from *bilateral donors*, including for example the UK Department for International Development (DFID), the US Agency for International Development (USAID), and the Danish Ministry of Foreign Affairs (DANIDA). Currently, the biggest *private donor* is the Bill and Melinda Gates Foundation; other foundations with major investments in urban WASH include the Coca-Cola Foundation and the Stone Family Foundation. Major *multilateral donors*, who pool and then distribute multilateral funding for urban WASH initiatives, include UNICEF, the European Commission, the African Development Bank, the Asian Development Bank, and the World Bank.

8) How can progress be measured?

Programme success should be measured in terms of *outcomes* rather than simple *outputs*: for example, instead of just recording the number of toilets built (or the number of people you *expect* those toilets to serve), it is much more useful to measure the number of people who are actually using the new toilets. For a brief how-to introduction to this area, see the *WSUP Guide to Urban WASH Monitoring & Evaluation* (2014, forthcoming).

9) How can we ensure learning and dissemination?

Learning and dissemination are vital components of a WASH programme. Feeding learning back into programme planning will help to resolve short-term problems, and to improve long-term practice. Disseminating these lessons more widely will also be of value to urban WASH programme implementers from other organisations and in other countries. WSUP puts a lot of effort into learning and dissemination, and we would recommend this approach to other implementers. For example, WSUP teams organise and participate in national and international workshops, sharing programme experience with other WASH professionals. WSUP also produces publications on key programming issues, ranging from blog posts through Practice Notes to longer Topic Briefs and in-depth Discussion Papers: see the WSUP website.

10) Is everything in this guide definitive and 100% accurate?

No! Our ideas evolve, the sector's experience evolves, and this is only a rapid-reference guide: it's just a starting point. We have only very briefly indicated further reading in the text: for more information, see WSUP's publications (http://www.wsup.com/programme/research-and-learning/resources), but also the excellent online libraries maintained by organisations including IRC International Water & Sanitation Centre, WASHPlus, and WSP (World Bank Water & Sanitation Program). Finally, feel free to contact us with comments and suggestions, at erl@wsup.com.

ADDITIONAL RESOURCES

WSUP publications

One of WSUP's key objectives is to promote effective service delivery models to the WASH sector worldwide. To help share the lessons from our work on the ground, we produce a wide range of publications including Practice Notes, Topic Briefs and Discussion Papers, a number of which have been cited in this guide. All of our publications are free to download from our 'resources database' – a fully searchable library of our publications and other print resources: http://www.wsup.com/programme/research-and-learning.

References:

Bartram J and Cairncross S (2010) Hygiene, Sanitation, and Water: Forgotten Foundations of Health.

Boschi-Pinto C, Velebit L and Shibuya K (2008) Estimating child mortality due to diarrhoea in developing countries.

Eawag/Sandec (2008) Faecal Sludge Management

Hutton G, Haller L and Bartram J (2006) Economic and Health Effects of Increasing Coverage of Low Cost Water and Sanitation Interventions.

Muximpua O and Hawkins P (2011) Building blocks for effective faecal sludge management in peri-urban areas: the role of small-scale service providers in Maputo.

UN-Habitat (2010) State of the World's Cities 2010/2011.

UN-Water and WHO (2010) UN-Water Global Annual Assessment of Sanitation and Drinking Water (GLAAS) 2010: Targeting resources for better results.

UNICEF/WHO (2010) Progress on Drinking Water and Sanitation: 2010 Update.

UNICEF/WHO (2012) Progress on Drinking Water and Sanitation: 2012 Update.

Human-centered design website: www.hcdconnect.org.

Water Point mapper website: http://www.waterpointmapper.org.

WELL (undated) Health impact of handwashing with soap. WELL Factsheet: http://www.lboro.ac.uk/well/resources/fact-sheets/fact-sheets-htm/Handwashing.htm.

WSUP website: http://www.wsup.com.

Other useful background documents

The following titles provide good introductory reading on WASH. We include for guidance only – this list is not comprehensive!

Peal A.J, Evans B.E and van der Voorden C (2010) Hygiene and Sanitation Software: An Overview of Approaches.
Available at: http://www.wsscc.org/sites/default/files/publications/wsscc_hygiene_and_sanitation_software_2010.pdf.

Tilley E, Lüthi C, Morel A, Zurbrügg C and Schertenleib R (2008) Compendium of Sanitation Systems and Technologies.
Available at: http://www.wsscc.org/node/160.

WSSCC and WHO (2005) Sanitation and hygiene promotion: programming guidance.
Available at: http://esa.un.org/iys/docs/san_lib_docs/Sani_Hygiene_Promo.pdf.

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