

Getting to scale in urban sanitation



Scale-up of urban sanitation remains an elusive goal in most low-income cities. Donor interventions are often macro-investments without adequate attention to low-income communities, or small pilots that do not address the challenges of scale. This Topic Brief offers lessons for scale-up deriving from WSUP's 2008-2012 programme in Maputo (Mozambique) and Antananarivo (Madagascar). The WSUP experience suggests that useful strategies include the following:

- i) support established small enterprises to develop sanitation businesses, and support government to enhance demand;
- ii) engage with relevant stakeholders and key leaders to mobilise resources and address systemic constraints;
- iii) support realistic sanitation planning by demonstrating workable solutions, and providing usable technical and financial plans;
- iv) enhance investment and financial viability through novel approaches such as sanitation surcharges; and
- v) adopt a realistic and incremental approach to achieving full sanitation services at scale.

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1. Introduction

1.1. The challenge of going to scale

Some donor investments in urban WASH have enabled improvements in access to services for low-income populations at a relatively small scale, by supporting non-governmental organisations (NGOs) or community-driven initiatives. A common concern has been to stimulate demand for services, particularly in the case of sanitation. Other investments have supported policy and institutional change at the city level, aiming to generate pro-poor outcomes by a more top-down approach (e.g. by clarifying institutional responsibility for sanitation between government ministries, municipal authorities, utilities and others). A further approach – typically applied by development banks through governmental institutions, rather than NGOs – has been to invest heavily in infrastructure and at the same time high-level institutional reform, with the aim of bringing about a massive change in sector capacity. However, this has often produced very limited results for low-income city-dwellers, notably because these investments have typically focused on high-cost and low-reach sewerage networks serving only relatively wealthy urban residents.

¹ Garbarino S, Holland J, Brook S, Caplan K & Shankland A (2011) *The Political Economy of Sanitation: How can we increase investment and improve service for the poor?* Washington DC: Water and Sanitation Programme.

² Banerjee S & Morella E (2011) *Africa's Water and Sanitation Infrastructure: Access, Affordability and Alternatives.* Washington DC: The World Bank.

³ UNICEF & WHO (2012) *Progress on Drinking Water and Sanitation.* New York: UNICEF and WHO Joint Monitoring Programme.

⁴ Burra S, Patel S & Kerr T (2003) *Community-designed, built and managed toilet blocks in Indian cities.* *Environment and Urbanization* 15: 11-32

⁵ Satterthwaite D, Mitlin D & Patel S (2011) *Engaging with the urban poor and their organizations for poverty reduction and urban governance.* New York, NY: UNDP.

The challenges to achieving city-wide sanitation and hygiene services are diverse and well documented.^{1,2} Recurring themes include:

- Rapid population growth set against a huge backlog of residents without safe access (more than half of the urban population of Sub-Saharan Africa³), often concentrated in marginal areas where conventional sewerage, septic tanks and pit latrines may be ineffective (e.g. due to water-logged or uneven terrain).
- Poorly clarified sector leadership and responsibilities, with roles often divided across services (sewerage, faecal sludge management, environmental hygiene, personal hygiene) and institutions (utilities, municipal authorities, other agencies).
- Typically weak incentives for householders and landlords to invest in household facilities, because of insecure tenure in low-income informal settlements.
- Incoherent policy responses which fail to take a system-wide perspective, for example of software components (e.g. sanitation marketing) versus hardware components (e.g. drainage infrastructure), or different settlement types and income groups within the urban area.
- Insufficient understanding of the wider political economy of sanitation services, and application of one-size-fits-all assumptions. For example, the view that sanitation is universally regarded as a political dead-end within government has been challenged by recent evidence from India and Brazil.¹
- A lack of readily adaptable technology and policy approaches given the complex, transitory nature of urban settlements.
- A failure to stimulate innovation or capitalise on innovations by the local CSOs, community organisations, (informal) private sector providers and households themselves, which in reality provide services for many low-income residents.

Box 1: From the roots up - community capacity for sanitation change in India^{4,5}

In several Indian cities, Slum Dweller Federations and Mahila Milan (federations of savings groups formed by women living on the streets and in informal settlements) have been able to engage with local governments to secure support for building toilets and other construction and upgrading activities. Self-organised federations are likely to have greater clout than individuals or small organisations working in isolation. Communal toilets are likely to be an attractive proposition to local authorities: although shared facilities do not currently meet the UNICEF/ WHO definition of improved sanitation, they are likely to relieve pressure on government to provide services, at lower cost, and with the prospect of transferring operation and maintenance responsibility to existing, well-organised community entities. It may also be possible for poor communities to exploit an actual or perceived link between limited sanitation in their neighbourhoods and environmental health risks to wealthier and more influential urban populations, through concerns around water-borne diseases and open defecation. In this way, sanitation services become not only an end in themselves, but also a means to increase the interaction and accountability between marginalised urban communities and public administrations, and to break a cycle of clientelism, under which poor people must depend on individual political patrons to meet their basic needs.

The Indian NGO SPARC, which has supported the process, draws interesting lessons from these community-driven initiatives. First, even where the political economy of providing services to the poorest urban residents appears insurmountable, it may be necessary simply to get on with it: 'you have to get going - since the situation will never be perfect, no matter how long you wait' (Burra, Patel & Kerr, 2003, p.28.) Second, engagement on sanitation may be an entry point to resolving bigger political economy challenges: for example in securing recognition from the authorities around communal sanitation blocks, it may be possible to address bigger questions around land tenure.

⁶ See footnote 5 on page 2.

The limited evidence to date suggests that strong working coalitions or partnerships involving multiple actors – within government, or between government and non-governmental actors – can contribute to establishing a common vision for urban sanitation and, potentially, to translating that vision into concrete action (WSP 2011). Looking to urban services and housing more generally, there is growing recognition of the desire and capacity of urban poor residents themselves to improve their own living conditions, particularly as members of community groups and federations. Several examples have been successfully supported by local institutions, from government agencies providing trunk infrastructure in the Orangi Pilot Project, to the Thai Government's Community Organizations Development Institute, which has supported the Baan Mankong slum-upgrading programme, working with residents' savings groups.⁶ Neither multi-stakeholder coalitions, nor close work with communities and grass-roots organisations, are easy spaces for donors to work in, requiring significant investment in building and sustaining relationships which can be difficult for international funding agencies. Nonetheless, these trends represent relatively promising paths in otherwise impenetrable landscapes: landscapes which organisations like WSUP are endeavouring to map and navigate.

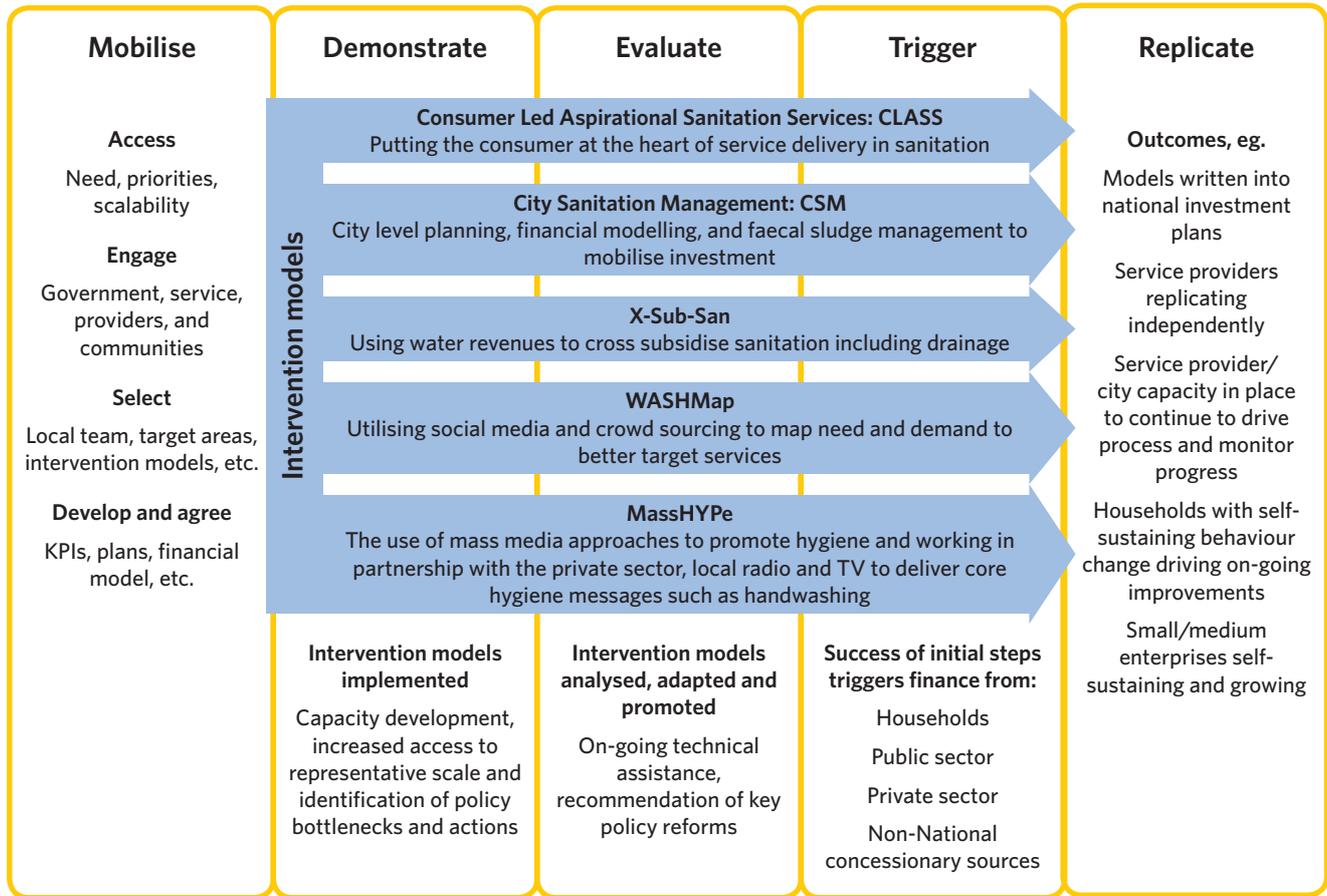
1.2. WSUP's strategy: from demonstration to scale

At the heart of WSUP's approach is the demonstration of new approaches for pro-poor service delivery. WSUP refers to these demonstrated approaches as 'intervention models'. Core to all of these models is the concept of mutual benefit to low-income customers and service providers: from working with sanitation service providers to develop desirable, financially viable sanitation products, to assisting municipalities and other stakeholders to develop a realistic, costed strategy for sanitation, as a basis for mobilising funding.

Following a phase of mobilisation, implementation is undertaken at 'demonstration scale', in collaboration with service providers, alongside provision of relevant capacity building and promotional activities. This is then followed by evaluation (to assess the viability of the model and indicate any necessary refinements) which is intended to trigger replication by service providers and the release of financing for scale-up. WSUP frames its overall modus operandi, within which the various intervention models fit, as a multi-stage 'process model'. In the case of sanitation, the process model is referred to as Total Urban Sanitation (TUS), summarised in Figure 1.

Financial viability is central to the WSUP intervention models, either as standalone products or services (e.g. CLASS, see Figure 1), or as forms of support that increase the overall financial viability of sanitation and hygiene services and service providers (e.g. X-Sub-San). In the case of sanitation and hygiene, weak or absent demand for products and services presents an additional barrier which may not be encountered in the case of water services. Consequently a number of WSUP's intervention models focus on awareness and affordability, notably MassHYPe and CLASS, described in Figure 1.

Figure 1. WSUP's Total Urban Sanitation process model, and selected intervention models. Adapted from WSUP (2012).



⁷ WSUP (2012) WSUP models. Internal document, Water & Sanitation for the Urban Poor.

The mobilisation stage is critical to understanding WSUP's way of working. During this phase, WSUP aims to bridge the gap which often exists between official service providers and a host of potential partners already involved in some form of service delivery activity, including civil society organisations (CSOs), community organisations, private enterprise, and higher and lower layers of government. This creates the opportunity for new models to be designed based on partnership, capitalising on synergies and providing space for dialogue and shared learning and for fostering new relationships between the different actors. The intention is that these relationships will evolve, through the design and demonstration of intervention models and triggering of investment finance, into new formal governance arrangements for the sector which enable service delivery for low-income households at city scale.

The process and intervention models, as described in Figure 1, represent WSUP's emerging thinking and a consolidation of 5 years' organisational experience across 8 low-income cities. In Antananarivo and Maputo a number of general intervention strategies have been attempted, which have not been branded by WSUP as intervention models as such, but which have nonetheless played a part within the overall effort to pioneer 'the development of a range of replicable and scalable pro-poor models for improved urban WASH service delivery in low-income areas.'⁷ To distinguish these from the more recently branded intervention models described in Figure 1, the term 'intervention strategies' is used in this Topic Brief to describe the four components of WSUP's work in Antananarivo and Maputo: these are examined in Sections 2 below, in order to evaluate their progress and success, and draw lessons for other agencies engaged in urban WASH. Two of the intervention strategies applied in Antananarivo and Maputo map to varying degrees onto the more recently conceived intervention model concepts, as detailed in section 2.

Table 1
Sanitation intervention
strategies in relation
to WSUP's vision for
scale-up.

Before examining the intervention style however, the elements involved in achieving service delivery at city scale need to be unpacked a little further. An important first step is to identify broad markers by which progress towards scale can be recognised, given that full city-wide implementation is likely to remain an aspiration in the short to medium term.

Intervention strategy or model	WSUP vision for scale-up
<ul style="list-style-type: none"> Supporting small enterprises to develop sanitation supply chains 	Engaging small local enterprises to meet gaps in the urban sanitation service delivery chain on a viable basis: <ul style="list-style-type: none"> Supporting production and marketing of hygienic household latrines (Tana) Facilitating markets for faecal sludge collection and disposal (Maputo)
<ul style="list-style-type: none"> Supporting communal and public sanitation facilities 	Development of scalable models for communal (Maputo) or public (Tana) sanitation blocks providing toilet and washing facilities for low-income households, including: <ul style="list-style-type: none"> Transferring management and cost recovery (for operations and maintenance, O&M) to communities Siting and management arrangements based on local dynamics Developing a cost-share model for capital costs
<ul style="list-style-type: none"> Surcharge systems for financing sanitation from water revenues <i>Aligns with WSUP X-Sub-San intervention model</i> 	Promoting innovative financing models for sanitation improvements, from local to city level, through surcharge systems: <ul style="list-style-type: none"> Developing community-level cross-financing arrangements (the RF2 model) for local sanitary improvements (Tana) Engaging for city-wide systems for cross-financing (a sanitation tax) in Maputo
<ul style="list-style-type: none"> Influencing city-wide sanitation planning <i>Aligns with CSM intervention model</i> 	Developing and promoting adoption of an achievable and costed strategy for incremental extension of sanitation services (full sanitation chain), through: <ul style="list-style-type: none"> Developing a costed, context-based implementation plan Parallel support to clarify institutional roles and develop workable models

1.3. What exactly is scale?

It is useful to distinguish between scaling out (horizontal replication of approaches to reach more beneficiaries) and scaling up (vertical integration into official policies and procedures, implying the development of supportive capacities and systems).

It is theoretically possible for sanitation to be delivered at scale without strong domestic ownership, through scaling out of a model introduced by an external agency, primarily with donor funds. While this may enable people to access services, there is a high risk that national service providers will not have developed the necessary capacities, management systems, governance arrangements and commitment to sustain, extend and improve services into the future. In contrast, WSUP's ambition is to achieve scale by using an initial external investment in demonstration of service approaches to leverage increasing resource commitments (financial and in-kind) from domestic service providers, along with uptake into formal policies and procedures.

Assessing progress towards scale thus requires assessing the extent to which ownership of service delivery approaches resides within the national/city system, rather than external agencies. Even if the number of beneficiaries has not yet increased beyond the demonstration scale, there are markers of progress which indicate readiness for scaling up. These could include uptake of demonstrated approaches into policies and plans, or increasing resource commitments from domestic service providers, not only for implementation but also for internal capacity development and establishment of new systems.

⁸ Jones L, Ludi E & Levine S (2010) Towards a characterisation of adaptive capacity: a framework for analysing adaptive capacity at the local level. London: Overseas Development Institute.

While domestic resource commitments, uptake of demonstrated approaches and growing demand are all promising signs of progress towards capacity to implement at scale, it may be necessary to make a further qualitative distinction as to the nature of that progress: are the resource allocations, policies and approaches undertaken by the service provider of the sort that will be sustainable and adaptable into the future?

The highly dynamic nature of developing cities presents an additional challenge. Urban demographics and consumer priorities - and therefore the nature of demand - are in constant flux, while water resource constraints and climate change-related risks (e.g. flooding) can be expected to increase in many contexts. This requires systems which are not only capable of maintaining service levels under current conditions, but have the adaptive capacity to respond in a forward-looking way to emerging challenges (see Box 2).

Box 2: Adaptive service delivery systems

A service delivery system includes: the full range of actors and institutions involved in service delivery in a broad sense (policymakers, planners, financiers, utilities, private suppliers, community and civil society organisations, households themselves); their activities, functions and technologies; and - critically - the interactions between these institutions and processes. These interactions include governance arrangements and official and unofficial flows of resources and information.

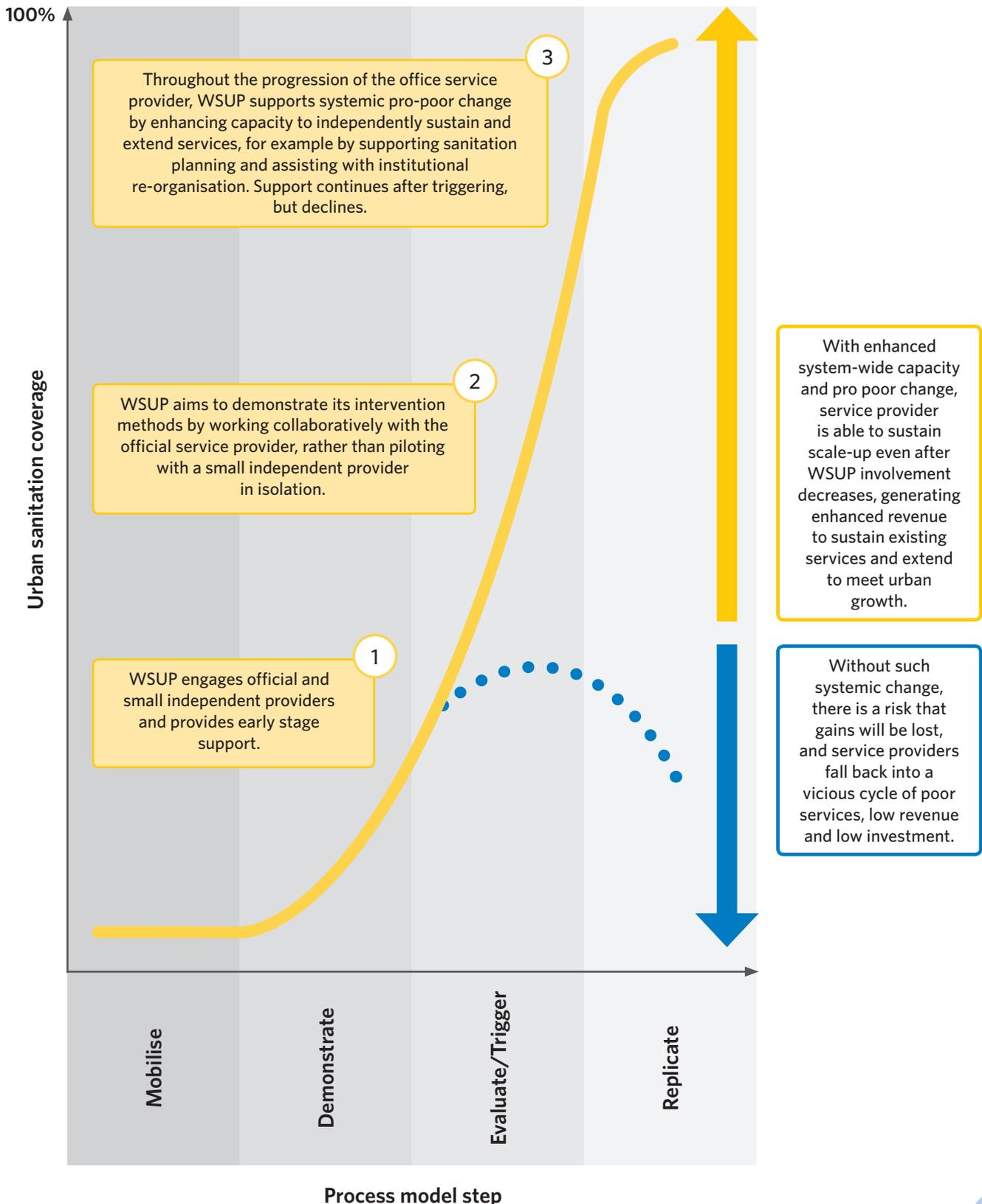
Many important functions relating to scale, and the ability to sustain any scale gains made, lie at system level and not within any one institution or process. These fall under the banner of adaptive capacity, a concept which has taken centre stage in the climate change literature, but which can be applied to any system facing rapidly changing, unpredictable pressures.

Five interlinked components which contribute to adaptive capacity at the system level have been identified:⁸

- An asset base which allows the system to respond to evolving circumstances.
- Flexible institutions which prioritise equitable entitlements to assets and services.
- Collection and analysis of information and production of new knowledge to inform adaptation.
- An enabling environment for innovation and experimentation, and the ability to explore niche solutions and take advantage of new opportunities.
- Flexible forward-looking decision-making and governance, as the system anticipates, incorporates and responds to changes.

WSUP has sought to intervene at various points in the system with the goal of promoting uptake and replication of specific models (such as those described earlier in Table 1) while simultaneously building important system-wide capacities and promoting pro-poor orientation across the board (see Figure 2).

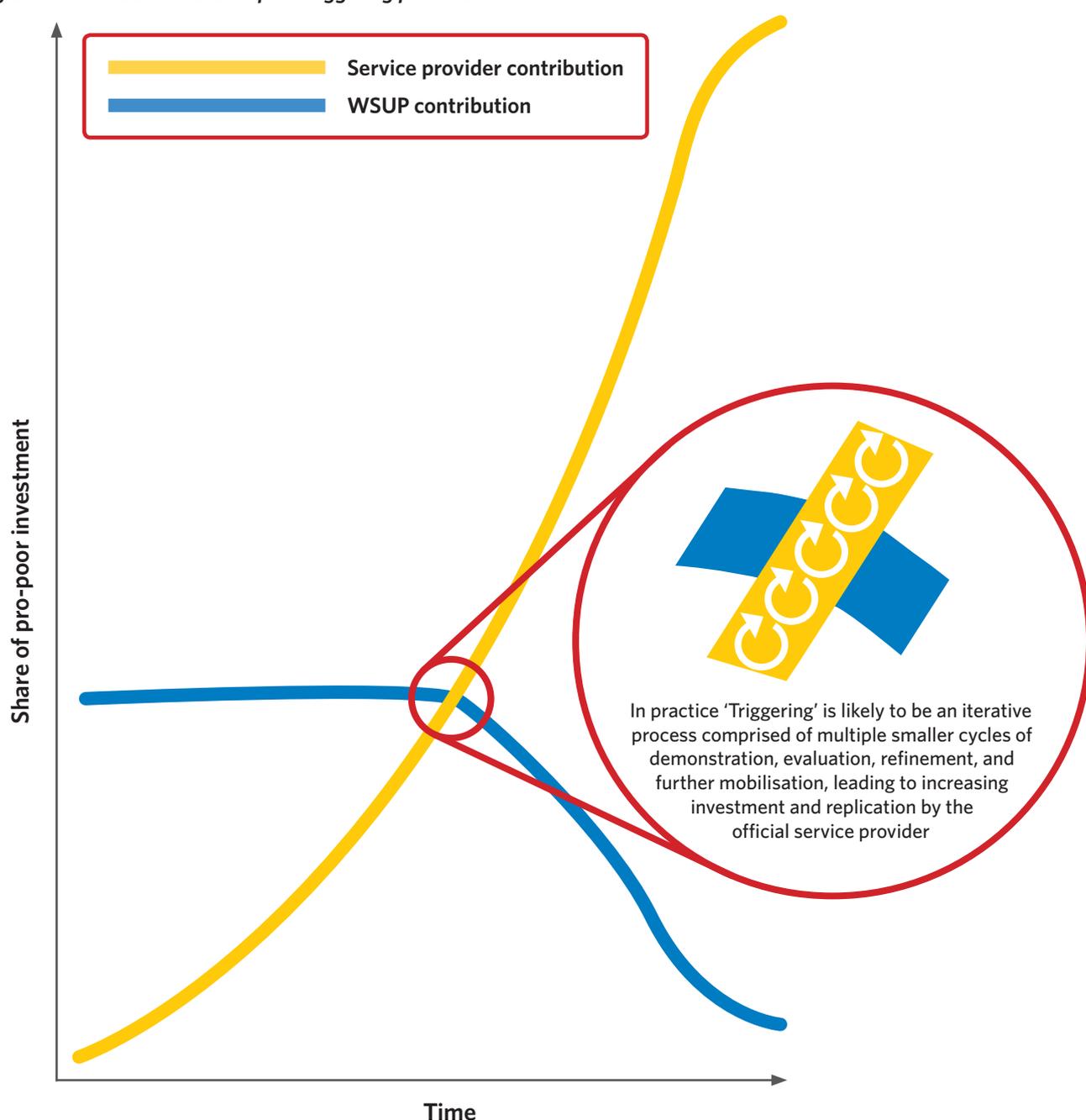
Figure 2. How WSUP aims to support systemic change and capacity for maintaining and extending pro-poor services throughout the process model.



1.4. Unpacking the 'trigger'

Figure 2 suggests that at a certain point following the demonstration and evaluation process, uptake into official policy and finance for scale-up will be 'triggered'. In reality this triggering is unlikely to be a single event, but will involve a process of further testing, gradual increase in investment of national resources (domestic and donor funds), and incremental scale-out to increasing numbers of beneficiaries, probably with adjustments to the model over time and a progressive reduction in the need for inputs from WSUP and other external partners. The wider political economy of the sector/city will come into play during this process, and the realities encountered may require re-evaluation of the model, additional mobilisation around pro-poor goals, and further adaptation of approaches. The desire to manage risks involved in applying new approaches, and simple resource limitations, are also likely to mean that scale-up will be incremental, at least initially, and subject to multiple decision-points, rather than resulting from a single trigger event. This is represented in Figure 3.

Figure 3. The iterative nature of the triggering process.



These concepts around what scaling entails, and the potential progress markers, provide a platform for assessing WSUP's achievements in Section 2, as well as for drawing wider lessons for agencies who share the goal of assisting service providers to achieve adaptable, sustainable scale-up. Figure 4 summarises the types of progress marker which may be relevant at each stage of the WSUP model from Mobilisation to Replication (notwithstanding the likelihood of iteration, rather than linearity, in practice). We will return to reflect on these progress markers in the concluding discussion.

Figure 4: Proposed markers of progress towards scale along the WSUP process model for urban sanitation.

	Extent of ownership of the programme by domestic actors	Input share from domestic sources	Nature of WSUP involvement	Number of beneficiaries / scale of implementation ⁹	Systems and policies in place to support and sustain
Mobilise	Commitment to enabling and learning from the WSUP demonstration programme	Relatively low	Lobbying, partnership building, design of models	Possibility at pilot level to mobilise interest	Not yet except insofar as the model builds on existing systems
Demonstrate	Increasing engagement in implementation, monitoring and evaluation over time as models and systems for implementation are refined. Domestic actors increasingly in the driving seat	Allocation of staff time and facilities to participate in implementation and evaluation. Progressively increasing share of financial costs and staff requirements	Initially leading implementation and analysis while providing capacity building to sector actors and fostering working relationships. Shift to a supportive / monitoring role over time	In the order of 100,000 households targeted. Progressively increasing to new neighbourhoods	Built during this process as demonstration includes development of support systems (inherent in delivery) and evaluation indicates policy and governance implications
Evaluate					
Trigger	Model formally adopted and replication led by domestic service providers	Entirely financed from domestic sources (or finance independently raised by domestic system)	Limited or no engagement around specific models. Focus on ensuring system-level capacities, policies and governance arrangements are in place for sustainability	More rapid, but still incremental increases up to citywide scale or beyond	Essential to ensure sustainability of scale gains, though scale may take place without them
Replicate					

⁹ In the case of sanitation, progress in increasing beneficiaries and on implementation may also be measured in terms of levels of demand (willingness to pay / sales of goods and services.) For consistency with the progress markers used in the case of water supply the same wording is used in the figure.

“Maputo and Antananarivo reveal the importance of building demand for new services if markets are to be viable”

2. Assessment of intervention strategies

This section analyses specific experience and lessons with four types of intervention strategy aimed at working towards scale-up of sanitation services in Antananarivo and Maputo: Supporting small enterprises to develop sanitation supply chains; Supporting communal and public sanitation blocks; Surcharge systems for financing sanitation from water revenues; and Influencing city-wide sanitation planning.

2.1. Supporting small enterprises to develop sanitation supply chains

In both Antananarivo and Maputo, WSUP has worked with local private enterprises to develop models to fill gaps in the sanitation supply chain: supply of hygienic, affordable household latrines in Antananarivo, and faecal sludge collection and disposal in Maputo. Although the business models differ due to their focus on opposite ‘ends’ of the sanitation chain, WSUP’s approaches in the two cities have various features in common. In both cases, WSUP sought to engage existing suppliers rather than establish new entities from scratch; this meant that suppliers were trusted and had existing market networks, which were important for their success. In both cases WSUP provided an initial subsidy to the supplier for start-up equipment and materials (an interest-free loan for the waste collection company UGSM in Maputo, and grants for masons in Antananarivo) and also provided technical support and training to enable them to provide the new goods and services. Both cases reveal the importance of building demand for new services if markets are to be viable and real improvements in sanitation are to be achieved (requiring ongoing public support). More attention may need to be paid to encouraging partnership approaches between municipal authorities (focusing on demand) and private sector suppliers.

2.1.1. Supporting production and marketing of hygienic household latrines in Antananarivo

WSUP estimates that in low-income areas of Antananarivo only 5% of households have access to hygienic toilets, so the intervention was focused on promoting sanplats (the cheapest form of cleanable latrine slab). Initially 22 masons in four peri-urban communes were trained to make sanplats, and given a start-up subsidy in the form of equipment and enough materials to produce 50 sanplats each. Retailers (existing stores selling hardware or building materials) were engaged to sell the sanplats to the public. Community Based Organisations (CBOs) were engaged to act as intermediaries between retailers and purchasers, in particular targeting low-income households. CBOs provide catalogues of sanplat designs and details of suppliers, and actively promote both sanplats and improved sanitation and hygiene behaviours in general. They also hold a revolving fund enabling low-income households to pay for sanplats in instalments, which has proved very popular, with more than a third of sanplats purchased under this scheme to date.

Eleven months later three quarters of the trained masons sell on average 10 sanplats per month. Those working in areas with high demand, with good existing networks in the community and a portfolio of other products, have higher volume sales and therefore find sanplat production more profitable. They have reinvested their own funds to produce considerably more sanplats than the 50 for which subsidy was provided. Some of the CBOs involved in sanplat promotion, noting the weight of the sanplats (a constraint at around 30 kg) have also engaged masons to produce and sell sanplats directly to customers.

WSUP in partnership with WaterAid Madagascar also supported marketing of the sanplat product at the city level, producing posters and catalogues and funding a mass media campaign with adverts on television and radio to build demand for cleanable latrines. This was closely aligned to a broader programme of sanitation and hygiene behaviour change promotion led by Commune WASH Committees, which also carried out household visits and public awareness-raising events, which simultaneously

¹⁰Bairro is the Portuguese-language term for urban district (whether low-income or not).

¹¹WSUP & UGSM. (2012). WSUP-UGSM Professional Services Agreement. London: Water and Sanitation for the Urban Poor & Uaiene Gama de Servicos de Maputo.

promoted improved sanitation and hygiene in general and the local sanplat suppliers in particular. WaterAid report that while the more successful suppliers could rely on word-of-mouth advertising for specific products, external support is essential to build demand for cleanable latrines.

For scale-up, it will be critical that government takes on the role of promoting behaviour change to increase (and sustain) demand for sanplats. Sanplat sales do not seem to be profitable enough for retailers or masons to be incentivised to invest substantially in marketing their products, at least at current levels of demand. For scale-up to occur, communes would need to step in and play a stronger role in sanitation and hygiene promotion.

2.1.2. Facilitating markets for faecal sludge collection and disposal in Maputo

Despite an estimated 56% of Maputo's population relying on on-site sanitation, principally latrines, major gaps in the full sanitation service chain have prevented these from becoming a safe and scalable option. One of the core challenges in low-income bairros¹⁰ has simply been the lack of adequate access roads for sludge tankers, to empty latrine pits once full.

WSUP opted to engage a well-established local solid waste management enterprise, UGSM, to provide faecal sludge management (FSM) services using high-suction, hand-operated Gulper pumps, with a system of carts to ferry waste out of the inaccessible areas of the bairros of Maxaquene A and B. Under a Professional Services Agreement (PSA), WSUP agreed to provide an interest-free loan of US\$ 20,000 to meet the costs of equipment including the Gulper pumps, collection buckets, hand carts and protective clothing, as well as training in safe and proper use of the pumps. Additional support is provided at no cost by a WSUP technical adviser. In return, UGSM committed to financing the costs of a sludge collection tanker to take waste to the treatment station.¹¹ As at April 2012, with operations underway for a few months, there appears to be good demand for UGSM's services, though mostly from relatively wealthy households, so that there is some concern that the fees charged may not be affordable to the very poorest. While there needs to be time for the model to bed in, it may need to evolve to integrate a stronger, FSM-focused marketing component and to consider how the poorest households can be supported to access pit-emptying services.

To help establish UGSM in its new role providing FSM services in Maputo, WSUP has also needed to broker relationships with the municipal council, Conselho Municipal de Maputo (CMM), at municipal and bairro level, as well as with the communities in the bairros. With relations already established through work including the sanitation blocks (Section 2.2) and outline City Sanitation Strategy (Section 2.4), WSUP was able to organise meetings with the municipal council as well as with secretarios de bairro, with whom a location for a sludge holding tank, accessible to the tanker, was agreed.

2.1.3. Key lessons: supporting small enterprises

Although these are two very different stories, from two different cities and two sides of the sanitation supply chain, they illustrate some common lessons. While WSUP's FSM pilot in Maputo is only in its infancy, the successes to date – for example UGSM purchasing a sludge tanker from its own funds – are in part a result of choosing an established enterprise as partner, rather than attempting to start an organisation from scratch. Similarly in Antananarivo, it is the sanplat producers and retailers with strong existing networks for word-of-mouth marketing who appear to be making the best business from sanplat sales, though it looks to be necessary for them to produce/sell other products with higher volume sales in order to sustain a viable business. This leads to another useful lesson: the importance of building demand for new sanitation products and services at the same time as developing the supply chain. There must be products and services available to meet demand created: careful analysis of needs and preferences is therefore important, as demonstrated in the decision to focus the sanitation intervention in Antananarivo on sanplat promotion.

¹²The Commune Urbaine d'Antananarivo (CUA) is the municipal government of the central city area; this area is surrounded by smaller peri-urban communes which comprise the association FIFTAMA. The city of Tana thus comprises CUA plus the FIFTAMA communes.

There is however less strong progress when it comes to leadership on wider sanitation and hygiene promotion by communes: aspects which will be vital to sustain or scale up demand. This suggests that marketing may need to remain a public (subsidised) function until demand becomes fully established, even if supplying particular goods and services can be a viable private market. Adaptive capacity (see Box 2) will also be critical if the model is to evolve, in terms of marketing or otherwise.

2.2. Supporting communal and public sanitation blocks

In both Antananarivo and Maputo, WSUP has supported the construction/rehabilitation of sanitation blocks (providing toilet and washing facilities) in areas occupied by low-income households. In Maputo, communal sanitation blocks were provided for small groups of households in several low-income bairros, managed by management committees elected by and from the user households. These have been well used as they are conveniently located and 'owned' by user households, and neighbouring communities have requested similar facilities. Blocks in Antananarivo are managed by Water User Associations which have hired operators. These have shown varying levels of use, but the block in the most convenient residential location has been used far beyond its design capacity, suggesting high levels of demand if blocks are located carefully.

In Maputo, cost-recovery levels appear sufficient to cover operation and maintenance (O&M) and produce a small surplus. In Antananarivo, two-thirds of sanitation blocks are able to cover O&M costs. In both cases, municipal government was involved in the development of the model and in supporting management committees and water user associations

to some degree; but the difficulty of recovering capital costs presents a challenge in terms of scale-up. WSUP is working with city agencies to try to find innovative cost-sharing mechanisms.

2.2.1. Transferring management and O&M cost recovery to communities

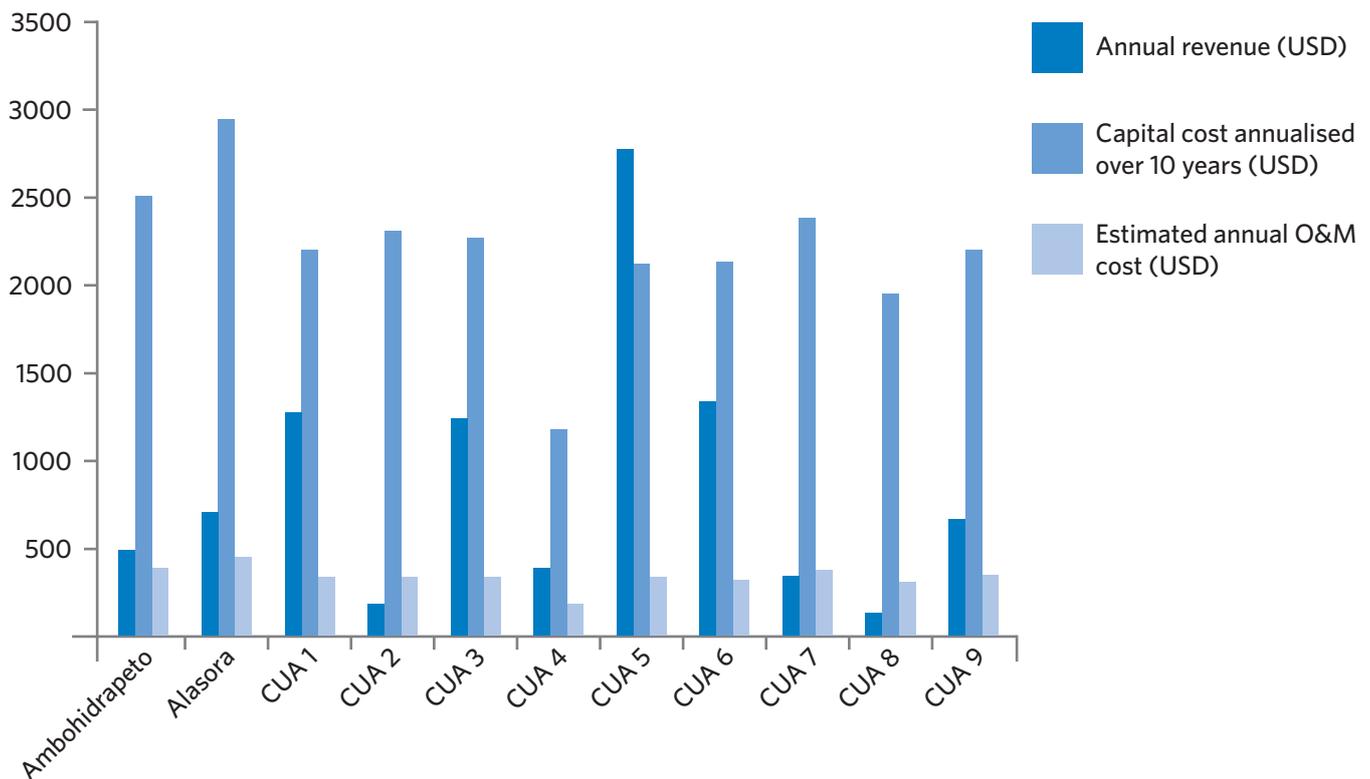
Although different management arrangements were put in place in the two cities, in both cases management was devolved to user associations/committees which then received training and support to fulfil their roles. Importantly, WSUP also brokered and formalised new governance arrangements with municipal government, and helped the municipality to support and regulate managers, providing some guarantees of service quality and a replicable model which could be scaled up.

In Maputo, management has been handed over to sanitation block management committees (SBMC). All households contribute to an operations and maintenance (O&M) fund managed by the SBMC, and share tasks such as cleaning and topping up water cisterns. Mutual expectations between the SBMC, households and municipality are defined in formal agreements, which still allow considerable autonomy for the SBMC to adapt management procedures as necessary. In Antananarivo, management of sanitation blocks was devolved to already-established Water User Associations (WUAs) who hired operators for day-to-day management and collection of user fees. In contrast with Maputo, in Antananarivo WSUP has helped strengthen management of WUAs by the municipality (the Commune Urbaine d'Antananarivo, CUA)¹² and has supported the establishment of WUA platforms for direct communication with the CUA to resolve any problems quickly.

Cost recovery is a central focus in both cities. Cost recovery for operations and maintenance seems to be feasible for the blocks in Maputo, and for those in Antananarivo which were located close to residential areas. In Maputo, however, non-payment by some households has been a problem: the monthly fees of around US\$ 0.74 represent 10% of the monthly income of the poorest user households. Efforts are ongoing to increase payment rates through community meetings aimed at generating 'peer pressure' with the support of local government, but other arrangements may be

needed to help the poorest households. WSUP in any case estimates that households contribute around 7% of capital costs through construction labour. The better-used blocks in both cities are generating a surplus which could contribute to capital costs, but overall it is clear that user financing of full capital costs is not viable (see Figure 5), and indeed ethically questionable in a context in which (as in many African cities) wealthier citizens benefit from a subsidy-supported piped sewerage system. For this reason, WSUP has begun to explore cost-sharing options which might enable capital costs to be met through a combination of user contributions, municipal investment and donor grants or loans (see below).

Figure 5. Annual revenues, estimated annual O&M costs and capital costs (annualised over 10 years) for WSUP sanitation blocks in peri-urban communes and the CUA, Tana.



Source
WSUP calculations
based on cost and
usage data.

Scale-up will require ownership of the model by municipalities, manifested in some level of investment and fundraising effort (as well as in capacity to plan and site infrastructure development). Prospects for municipal leadership seem to be stronger in Antananarivo, at least in the central commune (CUA), which has now developed an outline scale-out plan including 384 new sanitation blocks, pending finance. In Maputo, while local levels of government have been very engaged in the process and the central municipality CMM has made in-kind resource contributions in the form of land allocation and waived construction permit charges, it appears that CMM has not taken full ownership of the model. The difference relates in part to the fact that in Antananarivo a greater effort was made to strengthen municipal WASH functions, whereas in Maputo the model adopted for pro-poor water provision was household connections, a utility concern. Furthermore, the model adopted in Maputo, based around small groups of households sharing responsibility for some maintenance tasks, may require more intense community mobilisation to ensure viability: and this is an area in which CMM may lack capacity, especially following recent reductions in the staff responsible for community engagement (from 12 to 7). Also significant is that capital costs of sanitation blocks have been considerably cheaper in Maputo at US\$ 4,000-5,000, compared with an average of over US\$ 20,000 in Antananarivo; this probably

¹³See the WSUP 2011 Practice Note 'Location is everything: optimal placement of community water and sanitation facilities.'

reflects over-design in Antananarivo, i.e. construction to a higher standard than is necessary.

2.2.2. Siting and management arrangements responsive to local conditions

In Maputo, a cornerstone of the success of the model was the fact that the groups of households sharing a block themselves form compounds, which enables usage to be controlled and creates a natural incentive for user households to take ownership of the facility and contribute to management and upkeep, with much better prospects of sustainability. The fact that these clusters of households were located within existing sub-divisions (quarteirões) of the bairro administrative unit also facilitated close and sustained involvement of officials in sanitation block planning and management, and municipal engagement at local level has been effective.

In Antananarivo, siting of public sanitation blocks has been a learning process. Not all have been well used, but WSUP and the CUA have invested in careful monitoring of usage and revenues to better understand patterns of use and their implications for sustainability, and have taken account of the lessons learned by developing specific protocols for infrastructure siting, based on Lot Quality Assurance Sampling methods.¹³

2.2.3. Developing a cost-share model for capital costs

For these adopted communal/public sanitation models to be fully scalable, new means will need to be found to meet capital costs. In response, WSUP is engaged in identifying and analysing new creative cost-sharing mechanisms.

Firstly, ways are being sought to enhance the profitability of sanitation blocks while ensuring affordability to users. The addition of small kiosks selling frequently used goods (such as soap and candles) seems to be an effective approach in Antananarivo and is now being piloted in Maputo. Attaching a standpost selling water to a sanitation block to allow cross-financing may also enhance revenues: water kiosks have shown good profitability in Antananarivo, although in Maputo the addition of a standpost has provided water for handwashing and anal cleansing, but has so far not generated profit beyond covering its own operating costs (water bills and operator's salary).

Secondly - and most important for scale-up - WSUP has sought to leverage finance for capital costs from municipalities, donors and the private sector. In Maputo, an initial idea of 50% grant financing (municipal or donor) and 50% concessional loan financing (e.g. from an International Finance Institution) was explored, but it was found that user tariffs required to provide O&M and debt service would be two to ten times higher than current charges, at US\$ 3.40 per month. This would be far beyond the reach of the poorest users (earning US\$ 7.40 per month), but appears more manageable against the average income of user households of US\$ 89 per month, if payments could be reduced or waived for the poorest.

WSUP has recently secured funding under an AusAID grant requiring a cost-sharing agreement with the Infrastructure Department of the municipality, based on constructing 30 further communal blocks with 40% WSUP (AusAID) funding, 10% from users and 50% from the municipality. Although it is early days in this agreement, this does represent a possible pathway to scale-up, following a fairly successful demonstration/testing phase in which the municipality was engaged on a more limited scale. Of particular interest is the fact that this model shifts all responsibility for procurement and budget management to the municipality. While this might make for a more bureaucratic process compared with direct implementation by WSUP, it can also be expected to strengthen these municipal systems, with potential for more lasting gains.

In Antananarivo, WSUP is working with the Municipal Hygiene Office (Bureau Municipal d'Hygiène, BMH) to develop a public-private strategy to leverage private

¹⁴WSUP is interested in any system by which fixed and/or recurrent costs of sanitation for low-income communities can be raised through surcharges on water bills or water kiosk payments. Such systems may involve rich-to-poor cross-subsidy and/or water-to-sanitation cross-subsidy, or may simply be a co-charging mechanism (e.g. a full-cost-recovery charge for district-level stormwater drain cleaning is added to the water bill). Certainly, rich-to-poor cross-subsidy approaches may be considered ethically preferable. See the WSUP (2012) Discussion Paper 'Sanitation surcharges collected through water bills: a way forward for financing pro-poor sanitation?'

and government investment in sanitation blocks in the CUA, building on their outline scale-up strategy for WASH. In contrast with Maputo, no single partnership strategy is proposed but the BMH has issued a call for partnerships and remains open to offers.

2.2.4. Key lessons: communal and public sanitation blocks

WSUP's experiences illustrate the difficulties of finding a suitable financing model for communal and public sanitation, but also the potential for a high level of demand for such facilities in certain areas of cities, if they are located correctly, hygienically maintained, and affordable. With careful siting and responsiveness to demand and local dynamics, it appears that communal or public blocks can cover O&M costs and generate small surpluses which could contribute to capital costs. However, capital costs will require both external subsidy and municipality support to ensure lasting gains at scale. WSUP's efforts to strengthen the capacity of municipalities to raise funds (from public budgets, donors and the private sector), develop sanitation strategies, and manage relationships with new partners are clearly steps in the right direction (see Section 2.4).

2.3. Surcharge systems for financing sanitation through water bills

In both Antananarivo and Maputo, WSUP has sought to raise funds for sanitation improvements through co-charging or cross-financing from more profitable water services.¹⁴ In Antananarivo, a novel model has been applied to finance local sanitary improvements (wastewater canal cleaning) from water kiosk revenues, through an independent community platform termed RF2 after its local acronym. Following successes in canal cleaning, RF2s are now broadening their activities to include solid waste collection and hygiene promotion, and are collecting household contributions to finance these additional activities. The municipality views the model very favourably and is in the process of scaling it up across the central commune of Antananarivo, but long-term sustainability needs to be more systematically addressed. In Maputo, the focus has been on trying to implement a sanitation tax, provided for in law but never applied in practice, levied on water bills. This could unlock a significant volume of funding for sanitation, and has the active support of the water regulator CRA (Conselho de Regulação do Abastecimento de Água). WSUP has had some success in engaging relevant stakeholders, but many political sticking points remain in making the arrangement a reality.

2.3.1. Developing community-level cross-financing arrangements (RF2s) in Antananarivo

The RF2 is a new structure developed by WSUP, CARE and Antananarivo's Municipal Hygiene Office (BMH) in eight pilot fokontany (the lowest administrative subdivision) in the Central Commune (CUA), to coordinate WASH investments and organise environmental sanitation improvements, using cross-finance from Water User Associations (WUA) revenues and other local contributions. Terms of Reference developed by the BMH reveal a vision in which RF2s take on significant responsibilities for WASH at fokontany level, including to:

- Ensure coordination and monitoring of activities in canal maintenance, collection of household waste and hygiene promotion
- Develop a joint investment plan allowing them to negotiate and implement local development projects related to water, hygiene and sanitation
- Manage funds collected from different entities (including local businesses, schools and households living by the canals) in order to implement actions in response to local problems relating to water, hygiene and sanitation
- Ensure the implementation of an effective communication and information system at different levels

Initially the RF2s were supported to organise cleaning of tertiary wastewater canals which were blocked with solid waste and flooded regularly in the rainy season, as

“ Six months into the RF2 pilot, 1000 households are now receiving solid waste collection services ”

well as being contaminated with human excreta due to inadequacy of local sanitation facilities. There was previously no clear institutional responsibility for canal cleaning. More recently some are starting to pilot solid waste collection and hygiene promotion activities. Cross-financing from water sales is insufficient to fund these activities, so household contributions are being sought.

Two of the eight RF2s report a surplus each month, but some face shortages of basic equipment such as protective boots for canal cleaners. None are yet able to afford the equipment needed to clean deeper waste from the canals. For household solid waste collection, analysis found that collection rates of 28% would just cover costs, which seems likely to be viable. Monthly contributions of 200-300 MGA (around US\$ 0.10-0.15) are similar to what some households already pay private waste collectors, and RF2 members felt this to be affordable. Six months into the RF2 pilot, 1000 households are now receiving solid waste collection services.

In terms of scale-up, the BMH has taken strong ownership of the model and reports that they are now 'transplanting it everywhere': all new investments in WASH in the CUA will be required to work through RF2s in future, while the BMH is also supporting another municipality (Antsirabe) to establish a similar model. BMH staff have also expressed a commitment to careful monitoring and adapting the model as roll-out progresses, a promising indication of their increasing capacity and leadership. Taking a long-term view, though, the RF2 model is probably best viewed as an interim solution only. There are considerable risks in bypassing local municipal structures with the official mandate for WASH planning, and outsourcing this function to unelected volunteers. Experience of volunteer-based programmes suggests that sustaining capacity and ensuring accountability can be a challenge, and that enthusiasm can wane after an initial phase of intense external support. Eventually, it would be desirable to integrate RF2s at least partially into official structures, to build more lasting municipal capacities and ensure accountability and sustainability of local WASH programmes. Improved sustainability could also result if RF2s evolve in another direction which WSUP is exploring, into local community-based enterprises which generate a profit from some activities (e.g. solid waste management) to cross-finance others.

2.3.2. Engaging on city-wide systems for cross-financing

In Maputo, attempts to find alternative sources of finance for sanitation scale-up have primarily been made at the level of the overall WASH sector architecture, rather than in relation to specific service models. A sanitation tax is, in theory, permitted by a municipal by-law, earmarking 10% of water bill revenues for sanitation. However, while this has the potential to yield a reliable and substantial stream of income for sanitation, the political and financial challenges of implementing it are substantial. The original by-law has been in place for over a decade, and while the main actors - namely the municipal council CMM together with the regulator CRA and the asset holder for the water supply subsector (Fundo de Investimento e Património do Abastecimento de Água, FIPAG) - are meeting in a new Sanitation Steering Committee, there are still several contentious points of negotiation.

Foremost among these are the political and ethical implications of increasing water tariffs. The current system of charges for sanitation services in Maputo is socially regressive, with poorer residents dependent on on-site facilities which must be periodically emptied at their own cost, while wealthier households enjoy sewerage services that are essentially free. CRA is keen to use any levy on water bills to the advantage of low-income households, by exempting them from any rise in prices, while ensuring the revenue is used to improve on-site sanitation services. However, high water tariffs have contributed to civil disturbance in the past (see the parallel Discussion Paper on scale-up of water supply services) and there are concerns that a surcharge for sanitation services, which are as yet of poor quality even for seweraged households,

¹⁵See footnote 11 on page 12.

would be politically untenable. The President of CRA therefore cautions that service quality will need to increase before a sanitation surcharge becomes acceptable to customers – which is itself likely to require external investment finance. [See also WSUP's (2012) Discussion Paper 'Sanitation surcharges collected through water bills: a way forward for financing pro-poor sanitation?']

2.3.3. Key lessons: sanitation surcharging systems

The experience of promoting a sanitation tax in Maputo suggests that while achieving large-scale surcharging systems could unlock significant volumes of finance, it is likely to be challenging and subject to domestic politics over which an external agency can have relatively little influence. Greater progress may be achievable in the short term at local level, particularly where water kiosks/standpipes serve a significant number of people. Experience in Antananarivo has found that these can generate surpluses which can be ploughed into local sanitary improvements through a community WASH platform as an interim solution. This model is now being progressively taken to scale by the municipality, although the provision of supportive investments and functions appears to be lagging behind somewhat; this may need to be given more focus in future.

2.4. Influencing city-wide sanitation planning

Given the lack of strategic direction for the sanitation subsectors in Antananarivo and Maputo – particularly as regards the continuing need for onsite solutions and related faecal sludge management (FSM), especially in low-income areas – WSUP commissioned consultants to prepare outline sanitation strategies for the two cities. In an attempt to encourage buy-in to what is inevitably a technical exercise, the limited consultations carried out in the course of the strategies' preparation have been supplemented by parallel engagement around demonstration of specific technologies, as well as working with the related stakeholders towards helping clarify emerging institutional roles and supporting key players in these roles. In both Antananarivo and Maputo, there are signs that this essentially two-fold process is beginning to bear fruit.

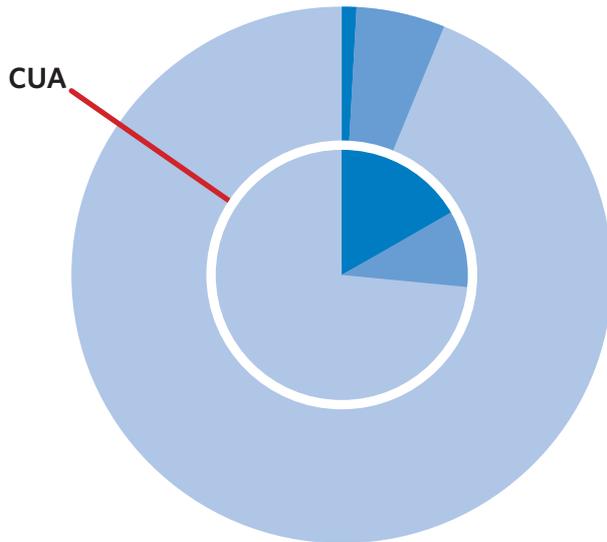
2.4.1. Developing a costed and context-based implementation plan

In Antananarivo, access to sewerage is very limited in the CUA¹⁵ (17%) and virtually non-existent in the peri-urban communes (estimated 1% - see Figure 7). In Maputo, sewerage coverage is estimated at 13% (Lahmeyer 2004), concentrated in the downtown cidade de cimento, the 'cement city' primarily comprised of commercial premises and higher-income residences.

Antananarivo's outline strategy covers software components (such as baseline studies, capacity development and hygiene promotion), as well as hardware requirements (including management of excreta, waste- and storm-water, and solid waste). The 5-year strategy is costed at € 8.7m, and places a high degree of reliance on users to fund their own sanitation hardware and to contribute to maintenance of key sanitation infrastructures such as drainage canals.

The Maputo strategy is more detailed and ambitious in scope and scale, although the proposed timeline for key deliverables is 'rather ambitious'. The vision for city-wide 'integrated sanitation development' incorporates water supply, solid waste, drainage and excreta management, and takes into account broader urban planning imperatives. The outline budget for activities in Maputo is much larger than for Antananarivo, at US\$ 360m. The main difference in costs appears to arise from an ultimate preference for more expensive hardware: off-site sanitation options, notably condominal sewerage, are proposed for several areas. Nonetheless, the indicative cost estimates for Maputo may be more realistic. Comparison with the World Bank-financed Maputo Municipal Development Program (MMDP II), a multi-sector project requiring US\$ 50m over 5 years, provides an initial indication of the scale of what is required.

Figure 7. Access to different excreta management options in the CUA and peripheral communes of Tana.



Source

Buschenschultz et al. (2004), cited in SOMEAH Conseils & WSUP (2010).

2.4.2. Parallel support to clarify institutional roles and develop workable models

In Antananarivo, WSUP is simultaneously pursuing demonstration-level work on sanitation marketing and now on FSM. For the latter, the intention is to pilot a low-cost faecal sludge treatment facility, in partnership with UN-Habitat and UNICEF, within the CUA where there is already a public agency, Service Autonome de Maintenance de la Ville d'Antananarivo (SAMVA), with formal responsibility for emptying of latrines and septic tanks. The Ministry of Town Planning has proposed sites for the demonstration work, indicating its interest in the project. Similar, but already well-established, are WSUP's efforts to support WASH planning in the peri-urban communes through Commune Development Committees (CDDs) and commune development plans. At least where the mayor is supportive, this has been effective, with some communes gaining a budget line for WASH for the first time, and greater capacity for planning and supervising infrastructure improvements. The Municipal Hygiene Office (BMH) also indicate that they have a greater understanding of the importance of communal infrastructure and have adopted the protocol developed by WSUP for siting such infrastructure.

Such interventions lay the groundwork for when larger donors re-enter the frame in Madagascar.

In Maputo, demonstration activities around sanitation blocks and FSM are on-going, but WSUP has also sought increasingly to contribute to clarifying sector leadership and roles. The urban sanitation sector has a proliferating number of major institutional players. There has been a drawn-out transfer of responsibility for drainage and wastewater treatment from the National Water Directorate (Direcção Nacional de Águas, DNA) to the municipality (CMM). Meanwhile, a new asset holder (Administração de Infra-estruturas de Abastecimento de Água e Saneamento, AIAS) has been established to take ownership of urban sanitation infrastructure. AIAS is as yet institutionally un-developed. The water regulator CRA is playing an increasingly important role, with a strong interest in taking on regulatory functions for the sanitation subsector, but limited capacity for this to date.

Having identified CRA as a key stakeholder with strong commitment to low-income service provision, WSUP and WSP are supporting it to take a key role in a newly formed Sanitation Steering Committee, bringing together stakeholders including CMM, AIAS and DNA. DNA is likely to focus on strategic issues, including operationalising the recently approved Urban Water and Sanitation Strategy. CRA, meanwhile, will focus on the creation of on-site sanitation services for the urban poor at Municipal District

“ A multi-track approach can increase traction with key players ”

level in Maputo, for which the City Sanitation Strategy should provide a basis.

2.4.3. Key lessons: influencing city sanitation planning

The difficulty of engaging stakeholders around technical, consultant-led plans is well known, but at the same time there was a conspicuous need for feasible and robust strategies, taking account of the existing sanitation infrastructure, situated within the broader socio-economic and environmental context of the cities, and most importantly focusing on the financial costs of onsite sanitation for low-income communities. As the long process of bringing the strategies to the table has gone on, WSUP has sought to engage key stakeholders in other ways: demonstration and collaboration around key 'implementation models', as well as support to convene stakeholders and strengthen capacity development for institutional actors in their emerging roles. Although the results have not yet been proven, there are signs that this multi-track approach can increase traction with key players, allowing more technical strategies to be presented to a more receptive and capable audience, and contributing to slow but steady development of sustainable capacity for pro-poor sanitation.

3. Conclusions: Lessons for scale in sanitation

3.1. Key lessons for scale in sanitation

Across all four 'intervention strategies' reviewed in this report, there has been mixed progress in moving relevant actors and the overall situation to a position where scale-up is possible, or even imminent. We suggest three main prerequisites for achieving scale-up in urban WASH services. These prerequisites underpin an adaptive and intrinsic capacity on the part of domestic actors, which goes beyond simply scaling-out, or blind duplication of service models. These prerequisites are:

- increasing ownership by local actors
- increased finance and capacity commitments from domestic sources
- gradually reduced involvement from support agencies, increasing beneficiaries and the evolution of internal systems to sustain services and adapt to changing circumstances.

Considering the urban sanitation experience from Antananarivo and Maputo, it is clear that the subsector has much further to go than water supply, before these prerequisites for scale-up are all in place. Major impediments remain, above all four related challenges:

- a lack of existing service approaches to address the sanitation chain in its entirety
- uncertainty about how to stimulate demand in the urban context
- severe shortfalls in funding
- unclear responsibilities, and in some cases low capacity, in the relevant institutions

Nonetheless, WSUP's experience indicates the following key insights about how an external agency can incrementally enhance the prospects for scale-up in this challenging environment.

¹⁶See WSUP (2011) Topic Brief 'Location is everything: optimal placement of community water and sanitation services'

¹⁷This summary interpretation relies on the understanding that most of the tax load will be borne by higher-volume water users, and that most of the tax revenue will go to equitable sanitation improvements for low-income communities (as opposed to sewerage for middle/high-income communities).

1) Support established small enterprises to supply sanitation services, and government to enhance demand, for best prospects of behaviour change

Experiences in developing household-based markets at both ends of the sanitation chain (latrine marketing in Tana, and faecal sludge collection and disposal in Maputo) clearly show the advantages of working with established companies to maximise credibility and build on existing customer networks. However, scaling up demand for services so that sanitation improvements benefit all households is a matter of engendering long-term behaviour change: and here close household engagement and media campaigns seem to have a role to play. City governments should be supported to engage in such activities, and at the same time supported in the challenging task of evaluating effectiveness and refining approaches accordingly.

2) Carefully assess demand and community dynamics, on an ongoing basis, to determine the appropriate mix of sanitation models

WSUP's investments in public and communal sanitation facilities in the two cities show the importance of assessing both prospective demand and ongoing usage throughout a pilot or demonstration phase, to ensure viability¹⁶ and public health benefits. For lasting impact at scale, especially given the dynamic nature of demand, supporting key adaptive capacities at municipal level is no less important than demonstrating the viability of particular models. These capacities include analysis of demand, community engagement, and flexible, responsive planning processes.

3) Engage at policy level through nominated or de facto institutional leaders to address systemic underlying constraints in the long term, mobilising local resources in the interim

Engagement around a possible sanitation tax in Maputo, basically to use revenues from wealthier water customers as a way of part-financing sanitation,¹⁷ show that such changes are likely to be highly political and long-term. The RF2 model demonstrated in Tana shows that, at local scale, progress can be made much more quickly by mobilising locally available resources, and this may provide models which city authorities can then adopt at scale. However, in the long run such models are not likely to prove sustainable if higher-level financial constraints for sanitation are not unlocked, and they do not remove the need for municipal services such as solid waste disposal and faecal sludge treatment.

4) Support significant strategy development on city-wide sanitation by assisting clarification of leadership, demonstrating workable solutions, and providing rigorous technical plans

A multi-track approach to supporting city-wide sanitation planning - combining initial consultant-led strategy development with institutional support and demonstration work to 'bed down' approaches and win buy-in from sector institutions - is having some positive impact. It is very early days and important contextual differences in different cities may require divergent responses in future.

5) Address the shortfall in system-level capacities for urban sanitation by involving stakeholders in demonstration of workable solutions

In many cases it appears that lack of uptake of demonstrated models is not a result of problems with the models themselves, or of a lack of interest among sector institutions, but rather relates to severe resource/capacity gaps in planning and delivering services across the sanitation chain. However, it is clear that demonstration-level work - including infrastructure investments - can provide an important focus around which to organise capacity development of sector institutions, and to strengthen system functions such as collaborative planning and analysis.

6) *Adopt a realistic, incremental approach to achievement of full sanitation services at scale, building relationships for the long term*

The underlying constraints on city-wide sanitation are severe: there are serious deficits in system capacities and leadership to provide sanitation at scale (illustrated by the absence of clear institutional arrangements in both cities); in resource availability for sanitation (illustrated by the struggle of Tana's Municipal Hygiene Office to leverage external investment, and the debates over the sanitation tax in Maputo); and in levels of demand itself (illustrated by both sanitation marketing programmes). Sustained engagement and learning to build institutional, as well as individual, relationships over the long term will be vital.

7) *Enhance financial viability of sanitation services through novel approaches including cross-financing and diversification*

WSUP's work has shown that certain elements of the sanitation chain appear to offer viable market opportunities (in particular, sale of household latrines and household sludge collection). However, it is likely that for individual small enterprises, such opportunities will need to make up one part of a diversified business approach: for example, UGSM in Maputo continues to provide solid waste services alongside its evolving pit-emptying business. Moreover, the experience in Tana and Maputo shows that there remains a need for public investment in certain functions and facilities: demand promotion, municipal-level waste management, hygiene promotion, and the capital costs of communal and shared facilities.

8) *Work with and through different constituencies, making an effort to 'speak their language'*

Prospects for building genuinely adaptive systems for scale-up, across different stakeholders and institutions, are enhanced if several strategies are used at once. In WSUP's experience in both the water supply and sanitation subsectors, this has required working simultaneously through or with low-income communities, technical cadres within local service providers, and institutions and individuals holding the relevant 'policy levers' and 'purse strings' (including government, asset holders, and regulators). This has been achieved in large part by drawing in allies that can speak convincingly to different constituencies (from community-based organisations, to consultants with engineering or financial planning backgrounds), underpinned by the solid and diverse skill-sets within WSUP's own staff.

The above lessons represent an attempt to distil a substantial body of work.

While WSUP has probably not yet fully reached the replication step of its process model for scale-up, via any of the intervention strategies described in Section 2, this is to be expected in the difficult terrain of urban sanitation where no clear pathways are known. Of particular interest are WSUP's achievements in demonstrating viable approaches for specific parts of the sanitation chain; its commitment to analysis and learning; and - to a varying extent across approaches in the two cities - its success in engendering some real interest in scale-up. WSUP has already commenced a shift in its focus towards supporting system-level capacities for sanitation, embodied most clearly in the city-wide sanitation planning process, but also in its capacity development work associated with the various demonstration models, and broader programmes of training and support offered to the municipalities (for example around business planning). Whether this shift can be fully achieved will perhaps be the ultimate test of the usefulness of the 'WSUP model'.

WSUP's approach is geared very much towards strengthening the five features of adaptive capacity outlined in Section 1 (after Jones et al. 2010):

- enhancing assets (e.g. supporting fundraising and investing in limited infrastructure)
- encouraging flexible institutions focused on equity (e.g. by responsiveness to community dynamics in developing communal sanitation)
- supporting collection and analysis of information (e.g. by analysis of sanitation demand in collaboration with city authorities)
- supporting innovation (e.g. developing partnerships between sector actors around new service models)
- promoting forward-looking decision-making (e.g. supporting the city-wide sanitation planning process)

Although in many cases it is early to say whether particular intervention strategies will ultimately be taken to scale in Tana or Maputo on a sustainable basis, in the authors' opinion WSUP's mode of engagement offers real promise.

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