

Integrated Slum Upgrading

How can we link water and sanitation improvements with wider urban development?

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Executive summary

Marginalised urban communities are often characterised by three things: complexity, interdependence of challenges, and constant evolution.

The sheer numbers of people living close together in poorly planned communities can make improving the quality of life extremely difficult.

The rapid rate of urbanisation – by 2050, the number of people living in African cities will double to 1.5 billion – means that there is no such thing as the status quo. Every month, every year, unplanned urban settlements get larger, and more complex.

In urban environments, issues such as water access, drainage, health, street design and solid waste management are all inextricably linked.

Poor drainage leads to flooding, causing damage to flimsy sanitation facilities. Rubbish collected in drainage canals can exacerbate the issue and lead to stagnant water which becomes a breeding ground for disease. Sanitation facilities cannot be safely emptied if poor road access makes it impossible for emptying services to operate.

Tackling these issues in an integrated manner makes intuitive sense – but too often it just doesn't happen, due to significant barriers such as cost, complexity, and the siloed nature of the development sector.

This report by Water & Sanitation for the Urban Poor (WSUP) and Arquitectura sin Fronteras (also known as ASF-España, referred to in the report as ASF-E), examines how to overcome this immense challenge, from the perspective of water and sanitation services.



Image: Communal sanitation block in Ghana. **Credit:** WSUP

The report demonstrates why water and sanitation improvements can be more effective when combined with other areas of urban development, and analyses how, in practice, this integration can occur.

Drawing on evidence from cities such as Maputo, Accra, Nairobi and Antananarivo, the report finds that integrating WASH with wider slum development can improve the overall impact, and the ease of delivery, of WASH services.

The report recommends that:

1. Integrated slum upgrading is the future, and organisations involved in water and sanitation need to partner with civil society organisations to ensure that WASH developments happen in tandem with progress in other areas.
2. The process of improving land tenure, plot boundaries and road access makes it much easier to improve water and sanitation services in informal urban settlements.
3. Water and sanitation organisations need to get out of the WASH silo, and make more efforts to engage with organisations working across urban development.

4. Funding streams which enable water and sanitation organisations to partner with organisations operating in other areas of urban development are needed, to help drive a more integrated approach to improving some of the world's poorest urban communities.

Of crucial importance to the report's argument is the needs of residents. Research conducted by WSUP in Accra, Ghana and Nairobi, Kenya, has sought to better understand how residents prioritise different basic services.

The report shows that whilst water and sanitation rated highly, issues such as street paving, flood control and garbage removal are all incredibly important to residents. The research helps us to understand basic services from an integrated perspective, rather than focusing solely on specific sectors.

Case studies featured in the report:

Maputo, Mozambique: implementing a land rights programme alongside improvements to sanitation. Working in one of Maputo's densely populated low-income communities, Chamanculo C, Arquitectura sin Fronteras supported a process of enabling residents to gain occupation rights. Alongside this, WSUP supported the Municipality to improve sanitation facilities. The sanitation improvement work was aided by the negotiations over access and plot boundaries, and the land rights negotiations were aided by the promise of new sanitation facilities.

Nairobi, Kenya: linking sanitation services into the country's biggest slum upgrading project, Mukuru Special Planning Area. Muungano wa Wanavijiji, the national federation of slum-dwellers, supported the creation of an Integrated Development Plan, with WSUP contributing to the process by working with the Nairobi City Water & Sewerage Company on much-needed sewer improvements.

Antananarivo, Madagascar: tying water supply to drainage and solid waste management, using revenue from water services to finance cleaning of drainage canals. Since 2009, WSUP in partnership with CARE and the Municipal Hygiene Office has been supporting community groups known as RF2s to clear rubbish out of canals in low-income communities across the city.

About Arquitectura sin Fronteras

ASF-España (ASF-E) is a non-profit organisation, founded in 1992, which develops cooperative projects in the architecture, infrastructure and town planning fields. It offers support to underprivileged populations in developing countries seeking the improvement of habitability and the defence of the right to dignified living conditions that promote a sustainable and fair human development. It is part of Architecture Sans Frontières International (ASF), an independent network of design not-for-profit organisations concerned with social justice, the cultural and environmental aspects of architecture and the conservation of the human and physical heritage aspects of the built environment.

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“We envisage cities and human settlements that ... fulfil their territorial functions across administrative boundaries and act as hubs and drivers for balanced, sustainable and integrated urban and territorial development at all levels... We commit ourselves to long-term urban and territorial planning processes and spatial development practices that incorporate integrated water resources planning and management, considering the urban-rural continuum on the local and territorial scales and including the participation of relevant stakeholders and communities.”

New Urban Agenda, adopted at
Habitat III, October 2016

1. Why integrate WASH with wider slum improvement?

High-quality water supply and sanitation services are critical to health and wellbeing. But most low-income residents of cities in the Global South currently *lack* high-quality water and sanitation. Governments and development agencies are making strong attempts to resolve this deficit, facing enormous challenges, including challenges related to financing, institutional structure and political economy. In this continuing endeavour, it is easy to forget that slumdwellers have multiple needs, not just water and sanitation. In fact, there are fundamental reasons for taking better account of these *multiple* needs, and for integrating water and sanitation initiatives with wider slum improvement and wider urban development, as required for slumdwellers to achieve a decent quality of life and dignified livelihoods. This paper explores how this might be achieved.

This approach is fully in line with international strategic commitments, including the New Urban Agenda adopted at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) in Quito, Ecuador, in October 2016, and subsequently endorsed by the United Nations General Assembly in December 2016. Notably, the New Urban Agenda states that *“We envisage cities and human settlements that [...] fulfil their territorial functions across administrative boundaries and act as hubs and drivers for balanced, sustainable and integrated urban and territorial development at all levels”; and that “We commit ourselves to long-term urban and territorial planning processes and spatial development practices that incorporate integrated water resources planning and*



Image: Resident waits outside communal washblock in Nairobi, Kenya. **Credit:** WSUP

*management, considering the urban-rural continuum on the local and territorial scales and including the participation of relevant stakeholders and communities”.*¹

There are two fundamental reasons for better integration of WASH with wider slum improvement: delivery synergies, and impact synergies. In other words, integration can potentially make WASH improvements both easier and *more effective*. We consider first impact synergies.

1.1) Integration to achieve impact synergies

One of the primary reasons for investing development funds in WASH is to improve health, and particularly child health: faecal-oral diseases are a major cause of mortality and morbidity in low-income urban communities,^{2,3,4} and hygienic water supply and sanitation are prerequisites for

¹ <https://habitat3.org/the-new-urban-agenda/>

² Wolf J et al. (2014). Systematic review: Assessing the impact of drinking water and sanitation on diarrhoeal disease in low- and middle-income settings: Systematic review and meta-regression. *Tropical Medicine & International Health*, 19, 928–942.

³ Headley D & Palloni G (2019) Water, sanitation, and child health: evidence from subnational panel data in 59 countries. *Demography* 56, 729–752.

⁴ Cumming O et al. (2019) The implications of three major new trials for the effect of water, sanitation and hygiene on childhood diarrhea and stunting: a consensus statement. *BMC Med* 17, 173.

Box 1: The MapSan trial

The MapSan trial was a major health impact evaluation of a WSUP shared sanitation intervention in Maputo, delivered by the London School of Hygiene & Tropical Medicine (LSHTM) and the Georgia Institute of Technology.⁵ MapSan was the first controlled health impact trial of a non-sewered urban sanitation intervention, and the first such trial focusing on urban shared sanitation facilities. The WSUP intervention evaluated consisted in the provision of shared pour-flush-to-septic-tank toilets to multiple households in compounds or household clusters: either shared toilets for smaller compounds, or larger “communal sanitation blocks” for larger ones. WSUP constructed about 30 communal sanitation blocks and about 160 shared toilets, all with septic tanks, in low-income compounds across various neighbourhoods (bairros) of Maputo. The researchers measured health outcomes in approximately 760 children before the intervention and at 12 and 24 months after the intervention (380 children with household access to interventions, 380 matched controls using existing shared latrines with poor sanitary conditions).

The research found that this shared sanitation intervention did not have an impact on the primary outcome variable (prevalence of enteric infections), though it did have a specific effect on two pathogens among very young children (the pathogenic bacterium

Shigella and the helminth *Trichuris*). In other words, the prevalence of enteric infections (i.e. the presence of one or more of the enteric pathogens in infant faeces) did not decline as a result of providing communal sanitation blocks or shared toilets. The intervention appears to have had some impact on faecal contamination in the immediate household environment, though significant contamination remained.

The MapSan trial indicates that this slum sanitation intervention was not by itself sufficient for combating faecal-oral disease. In fact, rigorous evaluation by the researchers confirmed that this was an effective intervention in terms of infrastructure quality and use: the new facilities were constructed to high quality, and were used as intended by the beneficiary population. So it was a “good intervention” by sector standards: but nonetheless no clear health impact was seen. This raises two main possibilities: **a)** that intervention coverage density was insufficient (the intervention improved sanitation in some compounds, but did not provide blanket improvement across the community); and/or **b)** that there may be a need for parallel improvements in other areas, potentially including better water treatment, education around food hygiene and handwashing, infant nutrition, animal waste management, and/or flood control.

breaking faecal-oral pathogen transmission pathways.^{4,6} However, recent high-rigour health impact trials in both rural and urban settings have found that even high-quality WASH interventions do not have a strong and consistent positive impact on child health.⁴

One of these trials (the MapSan trial) was carried out in an urban context: as detailed in Box 1, this trial did not detect a clear positive impact of improved sanitation on child health, though there

were some indications of reduced disease transmission. The strong implication of this research is that water and sanitation improvements are *necessary but not sufficient* for improving health in low-income urban communities: it seems likely that – in order to substantially improve health – water supply and sanitation need to be improved together, and in parallel with other improvements necessary for breaking faecal-oral disease transmission pathways. Specifically, improvements may be

⁵ The protocol for this study is published in Brown J et al. (2015) A controlled, before-and-after trial of an urban sanitation intervention to reduce enteric infections in children: research protocol for the Maputo Sanitation (MapSan) study, Mozambique. *BMJ Open* 5.6. For a full listing of study publications to date, see <http://mapsan.gatech.edu>. For a more detailed overview of this study than given here, see WSUP (2021) Achieving high-quality sanitation in low-income urban areas: Key findings and policy implications of research conducted under the Urban Sanitation Research Initiative 2016–2020.

⁶ Foster T et al. (2021) Modelling faecal pathogen flows and health risks in urban Bangladesh: Implications for sanitation decision making. *International Journal of Hygiene and Environmental Health* 233.

Box 2: Faecal pathogen flow modelling

The findings of MapSan suggest that sanitation improvements are *necessary but not sufficient* for combating faecal-oral disease among children in Maputo's slums. So what *other* types of improvement are necessary from the public health perspective? Rigorous impact evaluations like MapSan are very powerful for assessing retrospectively whether a particular intervention had an impact: but they're not so useful for understanding what type/s of improvement might potentially be most effective in any given context.

One approach to better understanding is system modelling, aiming to understand and model how faecal pathogens move in the environment, from original release to eventual exposure (for example, when a child plays in a contaminated street drain, or drinks contaminated water). A research study delivered under WSUP's Urban Sanitation Research Initiative 2016–2020 developed a system modelling approach of this type in Dhaka (Bangladesh). This research⁷ was delivered by the Institute of Sustainable Futures (ISF) at the University of Technology Sydney, in partnership with Emory University and the Institute for Diarrheal Disease Research in Bangladesh (icddr,b). The researchers aimed to develop an approach that can inform decision-making about sanitation infrastructures and services, in terms of optimisation of public health impact. The model was used

to predict the relative performance of eight sanitation options in reducing disease burden in a low-income area in Dhaka.

The results suggest that, relative to the existing sanitation situation in the study area (24% septic tanks, 5% holding tanks and 71% toilets discharging directly to drain), full coverage with septic tanks would be associated with a 72% reduction in disability-adjusted life years (DALYs), if well-managed. Other options considered, including simple coverage of street drains, or connection to a fully-centralised sewer treatment system, showed further reductions in projected health risk.

Over and above these specific findings for a specific community in Dhaka, this research is of interest because it provides *a potential framework for understanding how faecal-oral disease could be combated through integrated interventions*, not just sanitation. For example, it would be possible to use this approach to predict the health impact of different intervention packages involving improvements in (say) sanitation, drinking water quality, drainage/flood control and food hygiene. In other words, system modelling approaches of this type offer significant potential for understanding what integrated slum improvement should look like.

necessary in other areas potentially including infant faeces disposal, food hygiene, primary healthcare, drainage and drain covering, and solid waste management. In urban locations in which animal husbandry is widespread, hygienic management of animal faeces is likely to be important. One way of exploring *which* interventions are likely to be necessary in any particular context is through faecal pathogen tracking and modelling, as outlined in Box 2.

Thus it seems very likely that water and sanitation interventions could achieve *better impact* if carried out in parallel with other types of improvement in environmental quality and basic services. In other words, better integration of WASH with other aspects of slum improvement offers *impact synergies*.

1.2) Integration to achieve *delivery synergies*

We have seen that better integration can be expected to improve impact. But better integration can also be expected to facilitate *delivery* of urban WASH interventions. There are many inter-linkages between WASH and other sectors, including the following:

a) Formalising land tenure in low-income urban settlements facilitates service delivery by utilities and other water and sanitation service providers. Laying infrastructure such as water networks is challenging when land tenure is not formalised: it becomes difficult to define wayleaves (rights of way), and to identify communal land for communal infrastructures. Some utilities may be formally prevented from providing services in settlements defined by the authorities as informal, or indeed as illegal. In

⁷ Foster T et al. (2021) Modelling faecal pathogen flows and health risks in urban Bangladesh: Implications for sanitation decision making. *International Journal of Hygiene and Environmental Health* 233. For a more detailed overview of this study than given here, see WSUP (2021) Achieving high-quality sanitation in low-income urban areas: Key findings and policy implications of research conducted under the Urban Sanitation Research Initiative 2016–2020.

terms of billing, utilities may be unwilling to invest in infrastructure where land ownership is not defined, and unwilling to provide services to customers without defined ownership rights. Related to this, utilities may face challenges in service provision simply because of billing difficulties related to the absence of a defined system of street naming and house numbering.

b) Formalising land tenure increases sense of ownership and individual investment. Related to the above, people may be unwilling to invest in or maintain services because their ownership or right-to-occupation of land is not recognised. Land tenure is fundamental to the dignity of all urban residents and promotes ownership and individual investment: once tenure is guaranteed, slumdwellers can start investing in their plots without fear of being evicted. Slumdwellers can in fact become key investors in settlement development: though certainly, it is essential that this happens in parallel with socialising urban planning and building regulations that guarantee balanced development, and with subsidy streams sufficient to pay for infrastructures and services that low-income slumdwellers can't pay for themselves.

c) Solid waste management and drainage interact with sanitation. In the absence of adequate solid waste management services, domestic garbage and other trash may be disposed of to sanitation facilities – latrines, septic tanks, sewer networks – creating system blockages and making the emptying of pits and septic tanks more difficult and more costly. In the absence of adequate stormwater drainage, flooding may occur, leading to overflow of pits and septic tanks, with consequent health risks. And further complicating this, garbage disposal to open drains can block the drains and increase the risk of flooding.

d) Vehicle access within low-income urban settlements is important for water and sanitation services. Most notably, onsite sanitation systems based around septic tanks or container-based sanitation require easy vehicle access, so that pit-emptying trucks can access

septic tanks, and so that container-based sanitation providers can access households for container collection. Often, improving vehicle access in low-income settlements is tied to tenure regularisation, as discussed in the Maputo example below. Similarly, improved vehicle access facilitates solid waste management, and drain clearance and maintenance.

More widely, there are good reasons for supposing that wider improvements in livelihoods, social wellbeing and social cohesion will make water and sanitation easier. To take just one example: water theft and infrastructure vandalism are significant problems for some utilities working in some low-income urban communities. In communities with better livelihoods, social wellbeing and social cohesion, it can be expected that these problems would become less severe. And of course, people with better livelihoods are people who are more able to invest in household-level water and sanitation infrastructure and more able to pay for water and sanitation services.

Thus improving water and sanitation in parallel with wider improvements – in tenure, in road access, and in solid waste management and drainage – can be expected to make those water and sanitation improvements easier.

Summing up this section: there are strong arguments (impact arguments, delivery arguments) for better integration of water and sanitation initiatives with wider slum improvement initiatives. In WSUP's and ASF-E's view, it is evident that integrated approaches will lead to better outcomes for slumdwellers. We will explore one particularly promising integrated initiative (in Maputo) in depth, in Section 4. However, as discussed in Section 3, in practice integration is not straightforward. Integrated slum improvement is costly and politically complex: we're not saying this is easy!

But before moving to this discussion, we first consider how slumdwellers *themselves* prioritise different types of basic service improvement...

2. Prioritisation of basic services by slumdwellers

In 2019 and 2020, WSUP carried out a large-scale survey-based assessment of “what slumdwellers want” across two cities: Accra in Ghana, and Nairobi in Kenya.

The aim of this study was to assess how people living in low-income settlements prioritise different basic services. Surprisingly, literature review indicated that there have been few previous systematic studies of this type. We stress that the study did *not* aim to “demonstrate” the importance of water and sanitation, and various mechanisms were put in place to avoid possible bias in this direction. Rather, we aimed to neutrally assess prioritisation of the following list of 17 basic services (here in alphabetical order):

1. Administrative support with tenure rights
2. Air pollution control
3. Education (primary, secondary)
4. Electricity supply
5. Environment: clean rivers, public spaces
6. Fire-fighting services
7. Flood control & storm drains
8. Garbage removal, street cleaning, pest control
9. Healthcare (clinics, health visitors)
10. Housing build quality
11. Street paving
12. Policing & crime prevention
13. Roads and transport outside community
14. Sanitation: toilets, pit-emptying, sewers
15. Social care (elderly, disabled...)
16. Street lighting within community
17. Water supply

This list was drawn up on the basis of literature review, focus groups in low-income communities in the study cities, expert informant interviews, and research team analysis. Focus groups and in-country urban planners viewed the final list as a comprehensive and internationally understood summary of the broad areas of possible improvement.



Image: Resident uses a communal washblock in Maputo, Mozambique. **Credit:** WSUP

We then used this list in large-scale household survey across slums in each city. “Slum” was deliberately interpreted in a broad sense, to include situations ranging from “extreme” to “moderate”, and including both unrecognised informal settlements and settlements with some degree of tenure recognition. Sample size was about 3000 households per city, allowing characterisation of the whole city but also of 8 defined sub-areas within each city. The sampling approach used was systematic spatial sampling: more specifically, map-based systematic spatial sampling without clustering, and with posterior weighting for population size.⁸

As part of a wider questionnaire, respondents were given a set of cards (Figure 1), and asked the following:

1. “Please put the cards into four groups, considering whether you judge current service level to be *good* or *adequate* or *poor* or *non-existent*.”
2. “If the authorities were to invest money in this community, which 5 services do you think should be prioritised?”

⁸ Norman G et al. (manuscript in preparation) What do slumdwellers want? Service improvement priorities of slumdwellers in Ghana and Kenya.

Summarised results for Nairobi are shown in Figure 2. In top-line summary, the findings for the two cities are shown in Table 1 below. We also used logistic regression techniques to explore whether service prioritisations were associated with other factors (including current service level assessment). Here we do not have space to present the full findings of this study, but key findings are as follows:

- There were clear differences between the two cities, as we might expect, although we note that *sanitation* and *garbage removal* were top priorities in both cities. There was also some variation between communities in each city, though this was less marked than expected, suggesting that it can make sense to assess this at “whole-city” level.
- For most services, people who rated the current level of service X as less than “good” were more likely to prioritise that service (as expected). But counter-intuitively, people who rated current level of Service X as “poor” often prioritised that service more highly than people who rated current level of that service as “non-existent”: perhaps because they didn’t expect that service.
- Administrative support with tenure regularisation was not highly prioritised in either Accra or Nairobi (considering averaged whole-city data), despite evident tenure insecurity in some communities. This may reflect complex factors: for example, respondents may simply not have conceived as possible that the authorities might assist them with tenure regularisation.

Systematic studies of this type can inform urban planning: community prioritisation should not be the only factor in investment decision-making, but it’s an important factor. Also, studies of this type can identify mismatches between community prioritisations and technocrat prioritisations. If studies of this type were extended across a wider sample of cities, it seems likely that more generalisable conclusions might emerge, of potential value to wider thinking about urban development. And approaches of this type help

Table 1. Most frequently prioritised services-for-improvement in low-income communities in Accra and Nairobi. For example: in Accra 50% of respondents included “Flood control” within their top 5 priorities for improvement. Note that “Sanitation” and “Garbage removal” were top-5 priorities in both cities.

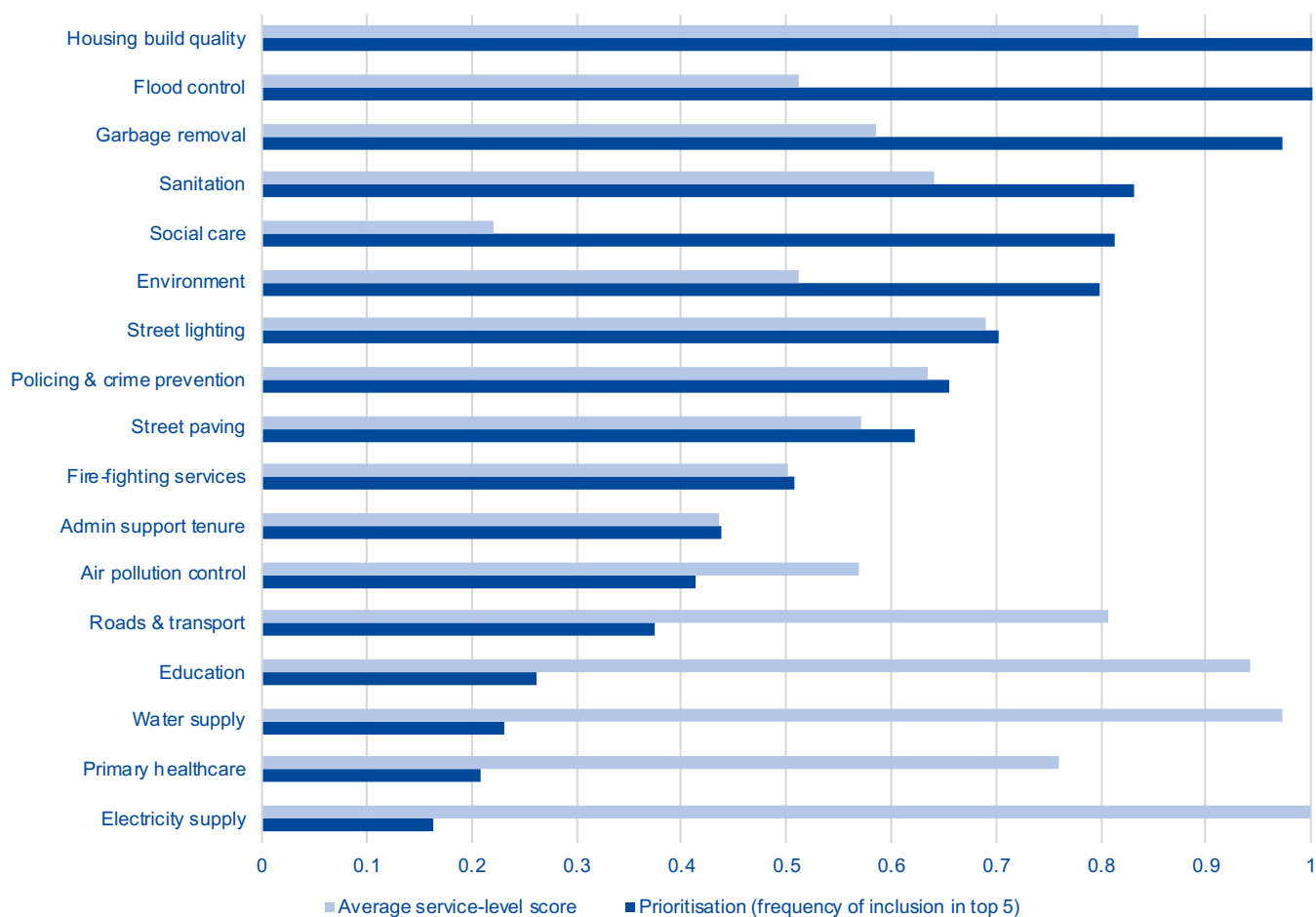
ACCRA	NAIROBI
Flood control (50%)	Sanitation (49%)
Garbage removal (48%)	Street paving (47%)
Housing quality (48%)	Water supply (46%)
Sanitation (41%)	Environment (44%)
Social care (39%)	Garbage removal (43%)

Figure 1. Cards used for presenting the 17 services to respondents (only 10 of the 17 shown in this photo).



us to understand basic services from an integrated perspective, rather than focusing solely on a specific sector like water and sanitation.

Figure 2. Perceived service quality and prioritisation in Nairobi. Blue bars represent the proportion of respondents who included that service within their top 5 for prioritisation, normalised with respect to the highest-prioritised service (*Sanitation*, included in top-5-priorities by 49% of respondents). Light blue bars show average perception of the current quality of that service (response options *good-adequate-poor-nonexistent* scored 3-2-1-0 respectively; values in the graphic normalised with respect to the whole-sample highest-scored service, Education).



3. Barriers to overcome

Above we have outlined why better integration of water and sanitation with wider slum improvement makes sense, in terms of intervention impact, in terms of intervention delivery, and in terms of slumdwellers' own understanding of their needs.

But before moving to consideration of specific case studies and recommendations, we want to recognise that this is not straightforward for actors working in the water and sanitation sphere.

First, water and sanitation actors (including utilities, municipal governments and NGOs) are generally working under grant, contract or plan laid down by ministries or development funders, requiring them to demonstrate advances in water and sanitation services within a generally challenging timeframe. Constructing 100 shared sanitation facilities in (say) a 3-year funding period is relatively straightforward: aligning this with wider slum improvements introduces political complexity and dependence on other actors, and is inevitably more challenging. In particular, tenure regularisation processes and improvement of road access are inherently complex processes that take time to achieve.

Second, integrated slum improvement is costly. Across-the-board improvement is likely to require investment in major infrastructures (for drainage and flood control, for example), and funding opportunities for such wide-ranging improvement are rare. When large budgets are available (from government or development funders), typically the requirement will be to maximise the "number of beneficiaries": so there is a fundamental pressure to support small improvements for many people, rather than major improvement for a smaller group of people.



Image: Polluted waters in Nairobi's informal settlements. **Credit:** WSUP

Third, and perhaps reflecting the previous two remarks, the development sector is highly siloed, at all levels. Funding tends to be directed at urban water and sanitation or at urban healthcare (for example), rather than at integrated urban development. As a result, key actors of all types (public, private, and NGOs) tend to work in their own specific spheres, with limited communication with other sectors, because the drivers and opportunities for integrated funding don't yet exist.

Highlighting these three challenges may seem like an admission of defeat. But in fact, as we will argue throughout the remainder of this paper, there are practical ways in which committed actors can work to overcome these challenges and drive an integrated vision of urban development. Of particular interest is an ongoing collaboration in Maputo between WSUP and Arquitectos Sin Fronteras (ASF-E), under the Habitat Project.

4. Integrated programming in Maputo: the Habitat Project

4.1) Background

Maputo, the capital of Mozambique, is a city of about 1 million people. Mozambique achieved independence from Portugal in 1975: since then, large-scale emigration, economic dependence on South Africa, a severe drought, and a prolonged civil war have hindered the country's development, with GDP per capita currently estimated at \$492. A UN-negotiated peace agreement between the opposing sides in the civil war (FRELIMO and RENAMO) ended the fighting in 1992. Currently FRELIMO is in power.⁹

Nationally the urban population is 37% of the total, and 80% of the urban population is categorised as living in “slum” conditions.¹⁰ Within Maputo, there is a clear distinction between the higher-income urban core of colonial origin (the “*Cidade Cemento*” or “Cement City”) and less-planned surrounding areas (*bairros*), some dating back to the colonial period as townships for authorised “native labour”. Many less-planned areas now have a mix of low- and higher-income occupants. For detailed analysis of the complex social dynamics and inequalities of power inherent in Maputo's urban geography, readers should consult the work of Jorge and Melo.¹¹

Mozambique has a complex institutional framework for urban water and sanitation services provision,¹² which certainly creates challenges for water and sanitation improvements in low-income urban areas. Water supply in Maputo was until recently delivered by a quasi-private operator Aguas de Maputo (AdeM), but AdeM has recently been essentially nationalised, and water supply in Maputo is now managed by the national asset-owning and service delivery institution FIPAG (although AdeM continues to operate on an interim basis, through a delegated management contract with FIPAG,



Image: School washblock in Maputo, Mozambique. **Credit:** WSUP

while longer-term arrangements are put in place). Responsibility for sanitation (both sewerage and onsite) lies with the Conselho Municipal (the municipality), which faces big challenges in maintaining the sewerage network and in supporting onsite services. The water and sanitation regulator CRA has recently been changed to AURA, with more clearly defined mandate for sector regulation; CRA was historically a powerful driver of service improvements for the urban poor, and the strengthening of its mandate is a very positive step. But certainly, the complex nature of the institutional framework at the city and national levels raises very significant challenges.

Against this complex and challenging backdrop, Maputo has nonetheless made significant advances in water and sanitation for the urban poor: some programmes can be considered international best-practice models. Most notably, over the period 2010 to the present, there has been a major programme of extension of

⁹ <https://www.cia.gov/library/publications/the-world-factbook/geos/uv.html>

¹⁰ <https://data.worldbank.org>

¹¹ Jorge S & Melo V (2014) Processos e dinâmicas de intervenção no espaço peri-urbano: o caso de Maputo” *Cadernos de Estudos Africanos*, 27, 1: 55-77. Jorge S (2020) The financialization of the margins of Maputo, Mozambique. *Housing Policy Debate*, 30. Melo C & Jenkins P (2021) Between normative product-oriented and alternative process-oriented urban planning praxis: how can these jointly impact on the rapid development of metropolitan Maputo, Mozambique? *International Planning Studies*, 26.

¹² WSUP Advisory (2021) How can African national institutions incentivise subnational actors to improve water and sanitation in low-income urban areas? Report for the World Bank, Water Global Practice Water Supply and Sanitation Global Solutions Group.

Figure 2: Contrast between formal and informal areas in Maputo - “Cidade Cimento and Cidade Canhão”



household and yard water connections to low-income communities:¹³ this is in striking contrast to the standard model in African cities, which is provision of services to slums through kiosks only.

4.2) The Habitat Project: gaining land rights through tenure regularisation

The Habitat Project (*Projecto Habitat*) is the Municipality's Urban Development Programme for Chamanculo C, one of Maputo's low-income communities.¹⁴ It began as a collaboration between the municipalities of Barcelona and

Maputo, and between Arquitectos Sin Fronteras (ASF-E) and the Mozambican Lawyers Association (*Ordem dos Advogados de Moçambique*); other partners have come on board subsequently. Its primary purpose has been the regularisation of land rights and associated agreement on plot boundaries and road access: WSUP became involved later, integrating water and sanitation. In this section we will discuss the project from the tenure regularisation perspective, drawing heavily on Márquez Martín et al. (2019):¹⁵ we will come to water and sanitation in Section 4.4. We stress that by “tenure regularisation” we refer to the whole package of tenure formalisation, plot boundary negotiation, and road access creation:

¹³ Zuin V & Nicholson M (2021) The impact of pro-poor reforms on consumers and the water utility in Maputo, Mozambique. *Water Alternatives* 14(1): 42-69.

¹⁴ More information on the Habitat Project is contained in the “Plano de Pormenor das Áreas Residenciais do Bairro Chamanculo C-PPRC”

¹⁵ Márquez Martín S et al. (2019) Ver para creer: la imagen como herramienta del acceso al derecho a la ciudad en los asentamientos informales de Maputo. https://www.researchgate.net/publication/335490594_Seeing_to_believe_the_image_as_a_tool_of_access_to_the_right_to_the_city_in_the_informal_settlements_of_Maputo

the three aspects are very closely linked. Chamanculo C is located close to the central “Cement City” area (Figure 3) and has a population of about 23,000.¹⁶ It benefited as a pilot area for urban planning initiatives prior to the Habitat Project, under the Chamanculo C Reclassification Programme (2011-2017)¹⁷ and the wider World Bank-financed PROMAPUTO programme that ran 2007 –^{15,18,19} Under PROMAPUTO, the following major steps forward were achieved by the Conselho Municipal de Maputo, with support from partners including the governments of Brazil and Italy:

- Incorporation of Chamanculo C into Maputo’s Urban Plan (*Plano de Estrutura Urbana*), through a complex process of multiple steps commencing in 2007 and continuing to the present. Particularly important has been the local plan for Chamanculo C (*Plano Parcial de Urbanização do Bairro de Chamanculo C*), approved in 2015 by CMM. This process of urban planning has had significant implications, formally enabling recognition of tenure, construction of permanent structures, and provision of basic services.
- Construction of two major roads of 1.7 km total length, greatly improving access to the centre of the city and providing major access into the settlement.
- Construction of stormwater drainage structures of 1 km total length, reducing seasonal flooding.
- Initiation of household-level tenure regularisation processes, mainly benefitting households close to the new roads.
- Other associated initiatives, including youth livelihoods training.

These early advances were enormously valuable, and a necessary foundation for the subsequent Habitat Project. But they were largely higher-level improvements that didn’t change the tenure insecurity of residents. The Presidente of the Conselho Municipal stated that “*for the first time, we can get from the centre of the city to the centre of Chamanculo C along a paved road*”. But most families lived away from these main roads: access within the community was still difficult, and residents were mostly unable to apply for tenure recognition. The advances in urban planning and major infrastructure were important, but most members of the community saw little improvement in their daily lives.

In Mozambique, all land is formally the property of the State. Occupation rights are granted through a title document entitled the DUAT (*Direito de Uso e Aproveitamento de Terra* = Right to Use and Exploitation of Land). DUATs provide formal right to land occupation and, importantly, they can be transferred. One of the prerequisites for a DUAT application is access to the plot from the formal road network. And a DUAT application is a complex 11-stage process²⁰, often costly, difficult and intimidating for residents of low-income communities. Prior to 2015, then, DUAT applications were difficult or impossible for most residents of Chamanculo C.

The primary focus of the Habitat Project starting in 2015 was to facilitate and enable the DUAT application process adapting Maputo’s Massive Land Tenure Regularisation method to a highly densified non structured settlement. The key element of the approach was **group application associated with within-group negotiation** at the block level (i.e. the *Quarteirão* level, about 50 plots/families). [Reflecting its socialist history, Mozambican cities have a highly structured hierarchy of local governance: see Figure 3.]

¹⁶ www.ine.gov.mz/estatisticas/estatisticas-demograficas-e-indicadores-sociais/boletim-de-indicadores-demograficos-22-de-julho-de-2020.pdf/at_download/file

¹⁷ Programa de Requalificação de Chamanculo C; see www.citiesalliance.org/newsroom/news/cities-alliance-news/maputo-slum-upgrading-activity-draws-experience-brazil-italy

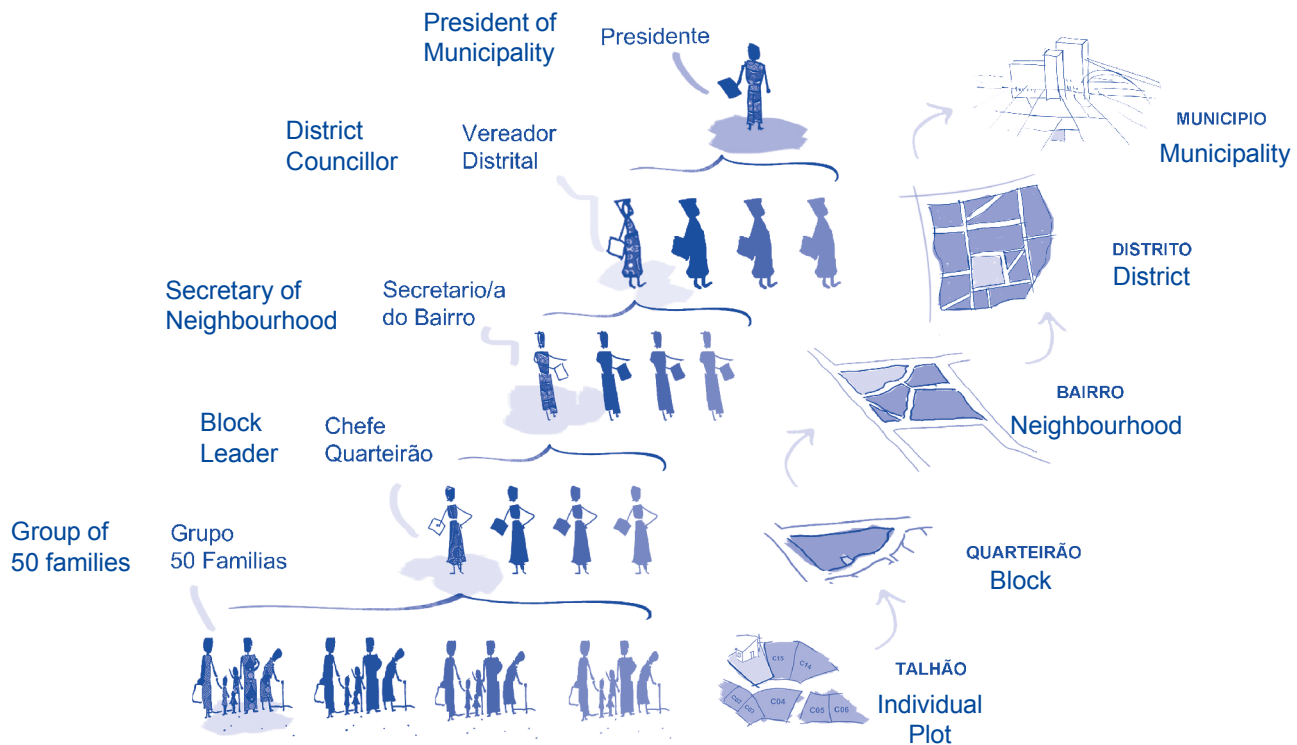
¹⁸ <http://documents1.worldbank.org/curated/en/240961516112247715/ICR-Main-Documents-P115217-2017-12-21-20-59-01102018.docx>

¹⁹ <https://projects.worldbank.org/en/projects-operations/project-detail/P096332?lang=en>

²⁰ Manual de Procedimentos – Metodologia de Regularização Massiva de DUAT – Maputo’s Municipal Procedura Manual for Massive Tenure Regularisation which defines a 11 stage process that can be implemented in structured settlements.

Figure 3. Schematic representation of the highly-structured urban local governance hierarchy in Mozambican cities. The neighbourhood of Chamanculo C comprises a total of 76 Blocks.

Author: ASF-E – Mariona Planiol Molist & Sara Márquez Martín



This group application approach had the following major advantages with respect to individual application:

- 1) Facilitated negotiation among residents within the block meant that, as a group, they could reach agreement on cession of land required for construction of access roads and streets, as required for DUAT application.
- 2) The significant costs of the process (mapping, drawing up plans, administrative and legal costs) could be shared among the group; and as part of the initiative, the Council reduced the normal charge to a more affordable amount.
- 3) The administrative process of DUAT application was made much easier for residents, and much easier for over-stretched Council staff.
- 4) ASF-E ensured neutral and professional facilitation of negotiation among residents, and technical support to ensure that applications were developed correctly.

The Habitat Project has from the outset focused strongly on the formalisation closely tied to plot boundary formalisation and access. Under initiatives prior to the Habitat Project, families in one Quarteirão were given DUATs as a pilot, under oath that they would subsequently respect planning requirements regarding boundaries and roads: but they didn't respect this, and this caused social and political issue controversy. So the Habitat Project started from the ground-rule that *"you can't get DUAT until plot boundaries and access are formally defined"*.

A summary of the precise process for supporting DUAT application is shown in Figure 4. For more information, see Márquez Martín et al. (2019). Figure 5 shows typical before-after situations, showing how the process is associated with access improvement.

Phase 1 of the Habitat Project (2014–2016) achieved construction of 300 m of streets, and laid the groundwork for the roll-out of the group DUAT application process. Phase 2 (2017–2018)

Figure 4. Schematic summarising the key elements of the approach used to facilitate DUAT application under the Habitat Project. Author: ASF-E – Mariona Planiol Molist & Sara Márquez Martin



1. Who are we?
2. What's my plot like?
3. The roads we build
4. The future city we decide together
5. Applying for the document
6. We've got our tenure papers!

systematised the protocol for group DUAT application and in 2018 the first batch of 32 DUATs was achieved, across a total of 5 blocks. Phase 3 (2019–2020) extended the initiative to a further 6 blocks. This is still only partial: the initiative has to date covered only 11 of the total of 76 blocks in Chamanculo C, and as at February 2021, a total of only 17 DUATs has been achieved under the Habitat Project. However, a bulk application for three Quarterões (totally about 150 individual plots) is currently submitted and pending.

Clearly, it has taken years for the Habitat Project to advance from early work to significant numbers of households benefiting from tenure recognition, and the process remains incomplete in Chamanculo C, and beyond that in Maputo's other low-income settlements. Certainly, the initiative has faced and continues to face significant political challenges and "political-administrative resistance". While this initiative offers a template to adopt in other low-income areas of Maputo, the challenges of replication should not be under-estimated. Urban land is a highly valuable commodity, and municipal governments typically lack resources to deliver services to formalised communities: so there are multiple political-economy drivers

pushing back against formalisation of informal settlements. Nonetheless, the progress achieved in Chamanculo C has been striking, and we believe this is an exciting positive model.

4.3) The Habitat Project: integrating water and sanitation

We have above outlined the central land rights component of the Habitat Project, focused on plot boundary definition and street access as a prerequisite for tenure formalisation.

But in 2017 ASF-E entered into an agreement with WSUP, whereby WSUP would work alongside the group DUAT process to support construction of compound, communal and household sanitation facilities.²¹

In Maputo, sanitation in under-served communities such as Chamanculo C is a major problem, with no sewerage sanitation available and many people dependent on unhygienic, unsafe pits with very little privacy. Such facilities are entirely insensitive to the needs of women, children and people with mobility impediments.

²¹ A compound toilet is defined as a toilet serving residents of several households with a defined (often fenced) compound, typically owned by a single landlord; a communal toilet is a toilet serving a group of households, but these within a single defined compound.

Figure 5. Typical before-after images under the Habitat Project which have created a common language between community, politicians and technicians.



In response to this issue, WSUP has worked with the Maputo Municipality and local communities since 2009 to develop and roll out a model of high-quality shared sanitation. Communal Sanitation Blocks were built to offer access for people with physical disabilities, menstrual hygiene facilities, handwashing facilities, a rainwater harvesting system to collect water for flushing, and a drained area to facilitate bathing. In other locations, Shared Latrines – comprising one toilet and a soakaway – were used. The choice of facility was determined through close consultation with the community; and this close engagement with the communities allowed for the creation of Sanitation Management Committees which focused on correct facility usage, maintenance and promoting hygiene practices. This model has been utilised in a number of communities across Maputo including Chamanculo C, and with positive feedback from residents.

While WSUP will always advocate for the provision of individual household toilets where feasible, the experience from this work has demonstrated the viability of communal sanitation blocks and shared latrines as sanitation solutions appropriate to the densely populated low-income areas of Maputo. The programme of work has provided a replicable model that can be implemented by the Municipality using available public procurement processes.

The integration of sanitation improvements with ASF's work on land rights offered multiple advantages:

First, identification of suitable plots for compound and communal sanitation facilities is challenging. By integrating this within the wider ASF-E-led process of negotiation of plot boundaries and access, it was substantially easier to find appropriate locations for compound and communal facilities.

Second, WSUP works not only to improve sanitation facilities, but also to develop and improve hygienic septic tank emptying services. By working in coordination with the Habitat Project, WSUP and partners can ensure that facilities are constructed in locations which will allow vehicle access for septic tank emptying.

Third, WSUP's involvement in some cases facilitated the community negotiations necessary for tenure regularisation. In the course of these negotiations, some residents may lose an existing toilet (for example, because that land is required for road access): in some cases, WSUP was able to compensate this with construction of another toilet in another location within or outside the plot. In other cases, a reluctant plot-occupier was compensated for loss of land for road access by construction of a toilet.

From the sanitation and health perspective, integrating sanitation within this wider urban development programme also had other advantages: as noted, PROMAPUTO investments prior to the Habitat Project greatly improved stormwater drainage with Chamanculo C, reducing the risk of flooding and overflow of septic tanks during the rainy season.

In real-world practical terms, how did this collaboration arise? In fact, WSUP has been working in Chamanculo C and other low-income bairros of Maputo for over a decade, and was aware of the work done under PROMAPUTO and subsequently the Habitat Project: the possibility of collaboration thus arose naturally, supported by strong personal relationships between WSUP's management and the ASF-E management team. Furthermore, WSUP's management team in Maputo had strong personal commitment to the concept of integrated urban development, aware of this concept's logic. The formal collaboration initially commenced in 2017 to align the projects being separately undertaken at the time by the two parties into an integrated urban approach under the Habitat Project. The collaboration has gradually strengthened with more funding secured by WSUP to increase the scope of the collaboration.

Having successfully implemented the integrated project in parts of Chamanculo C, ASF-E and WSUP also worked in partnership to assist the municipality to prepare and formalise the overall urban development plan for the settlement, which provides the basis for the settlement-wide Habitat project to be implemented.

The WSUP involvement as part of the collaboration with ASF-E has centred around sanitation. However, WSUP had an important focus on improving access to water in the early stages of its programme in Maputo, and assisted the water utility AdeM to improve the water network in parts of the community and extend access to water to unserved families through individual and shared house connections. This involved working closely with the communities to help the connection process. Integrating water with sanitation has also been important and both communal and shared sanitation facilities have access to water through connections to the improved water network. As the Habitat Project progresses it facilitates easier access to for water supply: in formalised blocks, the utility can now deal with households who have recognised tenure, formalised plot boundaries and good access for piped networks and vehicles. This overcomes many of the challenges highlighted in Section 1.2: notably, negotiation of wayleaves for piped networks should be easier, households should be more ready to pay water network connection fees given their security of tenure, and utilities should be less concerned about billing challenges given formal identification of customers with formal addresses.

As noted, WSUP came on board only in 2017. Ideally, WSUP would have been involved from the outset: as detailed in Box 3, basic services including water and sanitation should ideally be given full consideration from the outset.

4.4) The Habitat Project: lessons learned

Collaborations of this type – between water and sanitation actors, and actors involved in land rights and associated access improvement – are highly context-specific in nature. The Habitat Project can be adopted in other areas of Maputo, but it is unlikely that the experience can be replicated directly in other contexts, where the specific political and administrative challenges of tenure formalisation will be different. However, a number of broad lessons can be suggested:

1) Tenure formalisation is typically complex and takes a long time. Governments are typically reluctant to fully recognise the tenure rights of people living in informal settlements, and these rights lie within complex political economy contexts with rich opportunity for property speculation and corruption. In short, informal settlements typically occupy very valuable urban land: vested interests will see much opportunity for financial profit in situations of this type. This situation is complicated by genuine urban planning concerns: urban planners are understandably reluctant to rapidly recognise “squatter rights”, because they don’t want to encourage uncontrolled urban growth. But at that same time, the occupants of informal settlements (whether they’ve been there for 20 years or two months) are citizens with rights to basic services, just like the residents of formal planned settlements. Actors who are striving towards the formalisation of informal settlements must be aware of these complex inter-related challenges, and must work with persistence and political sensitivity to move things forward. None of this is easy: in the Maputo case, this has been a decade-long evolution starting with PROMAPUTO and continuing with Project Habitat. It has required very substantial injections of donor funding, and continued injections will be necessary to drive the process forward at scale.

Box 3: The complex challenge of sequencing

ASF-E's experience with the Habitat Project has made clear that textbook urban planning approaches (*"first plan, then intervene"*) are unlikely to work in contexts like Chamanculo C. In settlements of this type, everything is rapidly evolving: if you take two years to do a "plan", much of it may no longer be useful because everything – streets, plots, public spaces – has changed in the interim.

But correct sequencing is critical. Most importantly: what needs to be planned in advance, and what should wait until plot boundaries and street layouts have been defined? Responding to these questions is made more challenging by the fact that urban planning laws and regulations (in Mozambique as in most countries) were written for formal settlements, not for informal settlements which arose organically.

For example, minimum plot sizes and minimum street width are defined for formal settlements, but are not realistic for informal settlements. Conversely, defined minimum standards for informal settlements are necessary: you can't build a street just 2 m wide, there need to be minimum requirements. ASF-E spent a lot of time negotiating and defining minimum requirements of this type.

In ASF-E's experience of the Habitat Project, services that ideally need to be in place in advance include: transport connectivity outside the neighbourhood (major roads); major stormwater drainage infrastructures, and associated identification of any uninhabitable flood-prone areas; major services including electricity and water networks; core social infrastructures including schools and hospitals.

These services are mostly the result of city-level planning and investment, but they are necessary provisions at the neighbourhood level. Ideally these services should be in place. But in practice, not everything will be in place, and tenure formalisation processes in slum settlements will almost inevitably need to proceed against an imperfect backdrop: for example, detailed flood assessments and possibly major drainage infrastructure may be necessary, but may not realistically be expected in the near future.

Once a tenure formalisation initiative commences, process sequencing is key. In Maputo, the first step was to accurately census households and accurately map plot boundaries and existing accesses and infrastructures...

STEP 1: Communicating with community to ensure that they understand and are on board with the aims of the process

STEP 2: Detailed census and survey of households

STEP 3: Detailed mapping of plots, buildings and infrastructures, in consultation with the community

OUTCOME: Identification of exact number and locations of families, household sand plots; identification of land occupancy conflicts and disputes; identification of customers/users of water networks, toilets and sanitation infrastructure, drainage systems, electricity network, street lighting; assessment of the current state of these infrastructures

Negotiation of plot boundaries and access, and development of engineering plans for construction of access roads/streets and associated infrastructure include plot walls/fencing, street drains and electricity distribution

Associated infrastructure interventions including (in the Chamanculo C case) provision of sanitation facilities in compensation for land lost

STEP 4: Detailed mapping of the new layout (new plot boundaries, new accesses, new infrastructures)

Reassessment of water supply and distribution requirements, likely requiring modifications to existing network layout and control devices

OUTCOME: Detailed cadastral map, for incorporation into local urban plan. Once the detailed local urban plan (Plano de Pormenor-PPRAC) is in place this step will include up-dated each of the planning units. PPRAC is compulsory for granting DUAT.

STEP 5: Group application processes for DUAT

STEP 6: Communication, DUAT tax payment and DUAT award.

2) Tenure formalisation processes in slums require careful attention to sequencing.

Textbook urban planning processes (*“first plan, then intervene”*) are unlikely to work: the dynamics are too complex and fast-changing. But careful sequencing is necessary: tenure recognition cannot happen until **a)** community members have agreed on plot boundaries and on land which must be ceded for access streets; and then **b)** the new streets and necessary associated infrastructure (plot walls/fencing, readjusted electricity and water distribution, street drainage) have been built; and then **c)** the new layout has been accurately mapped to create a cadastral plan. Once a-b-c have happened, ownership or right-to-occupancy of individual plots can be recognised. This is detailed further in Box 3.

3) Facilitated group processes for tenure formalisation have multiple advantages.

As seen with Project Habitat, facilitated group processes at the “block” level greatly streamline the process of formal application for tenure recognition: grouping reduces costs for applicants and the administration, but also (very importantly) enables the complex community negotiations necessary to agree plot boundaries and land allocations for public access. Individual non-formalised “owners” (whether landlords or owner-occupiers) are strongly incentivised to cooperate in this give-and-take process because their eye is on the prize: formal recognition of their tenure.

4) Integrating water and sanitation in processes of this type has clear advantages.

As seen with WSUP’s involvement in the Habitat Project, parallel water and/or sanitation interventions can “lubricate” and support the community negotiation process. At the same time, there are clear advantages from the water and sanitation perspective: improving water and sanitation services is substantially easier in formalised settlements, for the reasons already noted: negotiation of wayleaves for piped

networks is easier, households are more ready to pay water network connection fees given their security of tenure, and utilities should be less concerned about billing challenges given formal identification of customers with formal addresses.

5) Stakeholder consultation and advocacy.

While stakeholder consultation is a necessary part of any community development programme, the importance of this as a mainstreamed component of the Habitat programme has been recognised. The stakeholder group includes the community, development partners, relevant municipality departments and the council, and other government agencies with responsibility for urban services (such as water, communications, energy). Given its pioneering status, the consultation process also requires advocacy to enable stakeholders to develop a full understanding of the approach and to obtain their buy-in.

6) When negotiating with communities, work slower and make clear commitments which can always be met.

In order to build trust with communities, projects which involve long-term change need to be broken down into smaller commitments which can be achieved in a defined, and short, time span. For example, when a land conflict is solved verbally, the agreement must be documented within two days. When a family agrees to give up land to the public space, the wall marking that concession should be built within three weeks. The fulfilment of each commitment builds trust which helps to accelerate the process of change. These tools of negotiation are a key part of the concept of human building²² – the attitude of building with and for people.

7) Images can be a powerful for ensuring politicians, technicians and the community are speaking the same language. For example, before and after images of widened streets are an efficient way of demonstrating what the project is trying to achieve and can accelerate buy-in.

²² S.Marquez 2017 REVISTA KULTUR – “Human Building, la actitud de construir con y para las personas, conclusiones a partir de 5 casos de estudio”. doi: <http://dx.doi.org/10.6035/Kult-ur.2017.4.8.9> – issn: 2386-5458 – vol. 4, n°8, 2017 – pp. 235-26 web 2nd of may 2021 <https://humanbuildingdotorg.files.wordpress.com/2018/05/kultur-human-building.pdf>

5. Other experiences of integrating WASH with wider urban development

The collaboration with ASF-E in Maputo is certainly WSUP's most direct experience to date of integrated programming: this is a direct and deliberate partnership to deliver sanitation improvements in synergistic association with a tenure formalisation initiative.

WSUP's other experiences of integrated programming have been less direct, but include two examples of interest, in Nairobi (Kenya) and in Antananarivo (Madagascar).

5.1 Integrated Development Plan for Mukuru, Nairobi

In Nairobi, the informal settlement of Mukuru was in 2017 declared a Special Planning Area (SPA), due to its unique environmental, health and development challenges. The SPA designation prevented development for a two-year period, requiring that the Nairobi City County government develop and adopt an integrated improvement plan for the area by August 2019. A participatory planning process led by Muungano wa Wanavijiji, the national federation of slum dwellers in Kenya, has supported creation of an Integrated Development Plan, in a process involving consultation with over 100,000 households: this is one of the biggest slum upgrading projects ever attempted.²³

As at April 2021, the Integrated Development Plan has not yet been formally approved by Nairobi City County, but the initiative has strong political support: according to a recent report,²³ *"The Mukuru Integrated Development Plan has the President's backing for implementation. New roads and sewers are connecting Mukuru to the rest of Nairobi, the area now has free, clean water and the Cabinet of Kenya has approved the construction of 13,000 new houses. Because of Mukuru, two more slum areas of Nairobi, Kibera and Mathare, have now also been declared as SPAs"*. Within the framework of this initiative,



Image: Beira resident cleans her yard in informal settlement. **Credit:** Stand Up Media

WSUP has been working with Nairobi City Water and Sewerage Company to pilot low-cost sewerage. Conventional sewers must be laid straight and deep, but this project involves simplified sewerage, which uses plastic pipes that can bend, be laid at a shallower depth, and cost less at between \$100 and \$200 per household. This indicative cost is essentially for upgrading toilets to pour-flush standards: NCWSC sewer connection fees have been waived to encourage uptake.

5.2 Development and scale-up of the RF2 model in Antananarivo

In Antananarivo, WSUP has long been involved in an initiative which ties water supply to drainage and solid waste management.²⁴ Since 2009, WSUP in partnership with CARE and the Municipal Hygiene Office (BMH) has been supporting start-up of community groups called RF2s (*Rafitra Fikojana ny Rano sy ny Fahadiovana*). Within each district (*fokontany*), the RF2 committee's mission is to coordinate community management of water, sanitation and hygiene. A key initial focus was to clean a

²³ ICS Centre (2020) Mukuru Special Planning Area (SPA) community mobilisation. <https://icscentre.org/innovationreport/2020/portfolio-item/mukuru-special-planning-area-spa-community-mobilisation/>

²⁴ <https://www.wsup.com/content/uploads/2017/08/PN001-ENGLISH-Water-Kiosk-Tana.pdf>

drainage canal that runs through 8 low-income fokontany in central Tana. During an initial phase, WSUP provided tools (shovels, wheelbarrows, etc.) and funds to employ community members for large-scale cleaning activities. A total of 5 km of canal was cleared during this phase, with RF2s then taking charge of daily cleaning operations.

The RF2 model has now been operating successfully for a period of time. BMH is now extending the RF2-led canal cleaning model throughout low-income fokontany of central Tana (the CUA area) with initial donor support, and the model has already achieved significant scale: there are currently 66 operational RF2, with canal cleaning and intermediary solid waste collection services continuing on a daily basis, using revenues from WUA-operated water kiosks and other sources to fund day labourers.

5.3 Beyond the water and sanitation sector

More broadly, we have been unable to find strong examples of other water and sanitation organisations working in close liaison with other types of slum improvement, as in the ASF-E - WSUP collaboration in Maputo. But certainly, progressive organisations including SNV are involved in structured urban water and sanitation planning within wider urban planning frameworks.²⁵ Similarly, WaterAid India's Urban WASH Strategy²⁶ places strong emphasis on tie-in to wider urban planning, noting that *"One of the most critical issues [...] is that [urban] water*

and sanitation programmes operate in isolation from programmes in health and education and reflect the fact that water and sanitation is not pursued with the aim of reducing disease, improving hygiene, improving educational levels or reducing poverty". A particular type of integrated programming which has attracted significant attention and funding is WASH and nutrition, and we here direct the reader to the WHO/UNICEF/USAID publication *"Improving nutrition outcomes with better water, sanitation and hygiene"*.²⁷

Stepping outside of the water and sanitation sector, there is wide international experience of slum upgrading: we do not attempt to review the extensive literature on this here, and direct the interested reader to key publications including Minnery et al. (2013),²⁸ Turley et al. (2013),²⁹ Pugalis et al. (2014),³⁰ Lucci et al. (2015),³¹ Magalhães (2016)³² and Corburn & Sverdluk (2017),³³ see also publications from organisations including the Cities Alliance,³⁴ and the Center for Global Healthy Cities.³⁵ Some major slum upgrading programmes have taken an intersectoral approach including water and sanitation: these include the Chile Barrio programme starting 1995, aimed at upgrading *all* informal settlements in the country, with provision of better housing and better services including water and sanitation. The program provided over 90,000 housing units at costs of US\$13,000–US\$30,000. Total direct spending was around US\$1 billion. India has a long history of integrated slum improvement programmes including water and sanitation, under the Jawaharlal Nehru National Urban Renewal Mission and other

²⁵ https://www.uts.edu.au/sites/default/files/ISF_SNV2016LearningPaperCitySanitationPlanning.pdf

²⁶ Dash M et al. (2015) Urban WASH Strategy. WaterAid India.

²⁷ WHO, UNICEF, USAID (2015) Improving nutrition outcomes with better water, sanitation and hygiene: Practical solutions for policy and programmes. See also <https://scalingupnutrition.org/nutrition/integrating-wash-and-nutrition-actions/>

²⁸ Minnery J et al. (2013) Slum upgrading and urban governance: Case studies in three South East Asian cities. *Habitat International* 39: 162-169.

²⁹ Turley R, Saith R, Bhan N, Rehfuess E, Carter B. Slum upgrading strategies involving physical environment and infrastructure interventions and their effects on health and socio economic outcomes. *Cochrane Database of Systematic Reviews* 2013, Issue 1.

³⁰ Pugalis L et al. (2014) Reappraising the World Bank responses to rapid urbanisation: Slum improvements in Nigeria. *Local Economy* 29(4-5):519-540.

³¹ Lucci P et al. (2015) What works in improving the living conditions of slum dwellers A review of the evidence across four programmes. ODI Dimension Paper 4.

³² Magalhães F [editor] (2016) Slum upgrading and housing in Latin America. Cities Alliance.

³³ Corburn J (2017) Slum Upgrading and Health Equity. *International Journal of Environmental Research and Public Health* 14(4): 342.

³⁴ <https://www.citiesalliance.org/resources/knowledge-library/>

³⁵ <http://healthycities.berkeley.edu/integrated-slum-upgrading.html>

frameworks. However, these ambitious programmes in India have been critiqued for not achieving substantive improvement in slum water and sanitation: the WaterAid India Urban WASH Strategy 2015 states that *“the principals of equity, inclusion and human rights approach to safe drinking water and sanitation to all, has not been adhered to, as was expected under this mission mode of working for urban reforms in WASH sector. This has resulted in impediments like not achieving universal outreach of WASH services in the covered areas with inequitable access to WASH even within the covered areas.”*³⁶

Massive national slum upgrading programmes – as seen most notably in Latin American countries including Chile, Brazil and Colombia – are perhaps not a realistic short- to medium-term prospect in most countries in sub-Saharan Africa and South Asia. Nonetheless, if we step outside of water and sanitation silos and project mindsets, we can perhaps consider that this is where we should be heading: towards an urban development model which conceives slum improvement as a multi-faceted project, within which water and sanitation improvements are an important element, but only part of a wider endeavour. While US\$ 1 billion national investments are not currently realistic for the countries in which international development finance is focused, the concept of integrated slum upgrading at the city or national level is perhaps the way forward, and we see steps towards this type of thinking in countries including Kenya and Mozambique.



Image: Drainage ditch in Beira, Mozambique. **Credit:** Stand Up Media

³⁶ <https://smartnet.niua.org/sites/default/files/resources/Urban-WASH-Strategy.pdf>

6. Summing up: ways forward

This paper set out to consider how water and sanitation actors might tie more effectively to wider slum improvement processes.

We have documented a particularly interesting collaboration between WSUP and Arquitectos Sin Fronteras in Maputo; we have also drawn upon relevant recent WSUP research, including the study of slumdweller prioritisations of basic services in Accra and Nairobi; and we have briefly referenced the wider literature and wider experience of slum upgrading. The advantages of better integration are very evident: but in practice, what can urban water and sanitation actors do in order to achieve better integration? As outlined in Section 3, it's not straightforward. We here offer some recommendations:

1) Integrated slum upgrading is the future.

Water and sanitation actors should look for ways of supporting integrated slum improvement initiatives, partnering with civil society organisations (like those forming part of the Slum Dwellers International confederation, SDI) to campaign for integrated slum upgrading. Where slum upgrading initiatives already exist (as in the Kenya Mukuru case), water and sanitation actors should strive to be constructively involved.

2) The process of improving plot boundaries and road access is a particular area where integration with water and sanitation services would be of benefit. Tenure regularisation (plot definition, street access, tenure formalisation) is critical to the wellbeing, livelihoods and dignity of people living in informal urban settlements. In more practical terms, tenure regularisation makes it much easier to develop better water and sanitation services. So water and sanitation actors should strongly consider ways in which they can work in close partnership with actors like ASF-E to achieve tenure regularisation.

3) Get out of that silo. At the global knowledge level, urban water and sanitation actors should be trying to escape from their silo, and partnering with thought-leaders in integrated slum improvement, like SDI and Cities Alliance. The two areas of expertise can be mutually beneficial: water and sanitation actors need to gain a better understanding of how they can fit in to wider slum upgrading processes, wider urban development actors can benefit from a more specialist understanding of water and sanitation (one of the core elements of most slum upgrading processes).

4) Integrate the funding. In the Maputo case documented here, WSUP secured funding from a donor who understood the benefits of integrated slum improvement. But most funding remains highly siloed within the WASH sector, and tied to a short-project mode of delivery. Ideally, we would see funding streams for integrated slum improvement, encouraging water and sanitation actors to partner with actors bringing other expertise. It's not easy for an organisation like WSUP to lobby for this: it may seem like we're arguing for a reduction in WASH-specific funding. We're not! We're arguing for funding streams which encourage urban water and sanitation actors to enter into partnership with actors like Arquitectura Sin Fronteras, so that urban water and sanitation improvements can take place alongside the other types of improvement that slum dwellers so desperately need. A key step in supporting this agenda is the continued measurement and demonstration of the increased economic and social benefits that accrue from such integrated programmes: the added value to funders as a result of enhanced direct and indirect benefits must be emphasised as new evidence becomes available.

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