Financing universal access to sanitation - lessons from four African cities
Building knowledge.
Improving the WASH sector.

Written by

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Contributors

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### Acronyms

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<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>AICD</td>
<td>Africa Infrastructure Country Diagnostic</td>
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<tr>
<td>CBO</td>
<td>Community-based organisation</td>
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<tr>
<td>CCODE</td>
<td>Centre for Community Organisation and Development</td>
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<tr>
<td>DAWASA</td>
<td>Dar es Salaam Water and Sewerage Authority</td>
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<tr>
<td>DAWASCO</td>
<td>Dar es salaam Water and Sewerage Corporation</td>
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<tr>
<td>Eco-san</td>
<td>Ecological sanitation</td>
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<tr>
<td>GDP</td>
<td>Gross domestic product</td>
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<tr>
<td>ICT</td>
<td>Information and communications technology</td>
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<tr>
<td>JMP</td>
<td>Joint monitoring programme</td>
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<tr>
<td>KCC</td>
<td>Kitwe City Council</td>
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<td>LDC</td>
<td>Least developed country</td>
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<td>MDG</td>
<td>Millennium Development Goal</td>
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<tr>
<td>MHPF</td>
<td>Malawi Homeless People’s Federation</td>
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<tr>
<td>MK</td>
<td>Malawian Kwacha</td>
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<tr>
<td>NGO</td>
<td>Non-governmental organisation</td>
</tr>
<tr>
<td>NWSC</td>
<td>Nkana Water and Sewerage Company</td>
</tr>
<tr>
<td>ODA</td>
<td>Official development assistance</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>OPP</td>
<td>Orangi Pilot Project</td>
</tr>
<tr>
<td>SDG</td>
<td>Sustainable Development Goal</td>
</tr>
<tr>
<td>SDI</td>
<td>Shack/Slum Dwellers International</td>
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<tr>
<td>SHARE</td>
<td>Sanitation and Hygiene Applied Research for Equity</td>
</tr>
<tr>
<td>TZS</td>
<td>Tanzanian shilling</td>
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<tr>
<td>WASH</td>
<td>Water, sanitation and hygiene</td>
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<tr>
<td>WSDP</td>
<td>Water Sector Development Programme</td>
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<tr>
<td>ZHPF</td>
<td>Zimbabwe Homeless People’s Federation</td>
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<tr>
<td>ZHPPF</td>
<td>Zambian Homeless People’s Federation</td>
</tr>
<tr>
<td>ZMW</td>
<td>Zimbabwean Dollar</td>
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</table>
Abstract

There is a significant ‘infrastructure deficit’ in sub-Saharan Africa that affects sanitation disproportionately. Sub-Saharan African governments have been unable to raise sufficient national revenue to invest in sanitation and therefore depend on development finance. Meanwhile, poor credit ratings linked to limited capacity to recover costs means that public utilities often cannot access credit for investment in sanitation infrastructure. National and local priorities for investing in sanitation continue to favour large-scale investments in technologies such as sewers, which often fail to serve low-income and informal settlements, and rarely invest in more affordable on-site solutions. Insufficient funding is underpinned by national sanitation policies and local governance arrangements that do not frame sanitation as a public good, though sanitary conditions will only be improved if everyone has access to adequate sanitation.

Shack/Slum Dwellers International (SDI) has been engaged in an action research programme focused on the collective development of sanitation ‘precedents’ that are acceptable to communities and local government, affordable in the long term, and that contribute to pro-poor endeavours to realise sanitation as a public good. This paper explores how communities in Chinhoyi (Zimbabwe), Dar es Salaam (Tanzania), Blantyre (Malawi) and Kitwe (Zambia) have sought to develop affordable sanitation precedents that aim to catalyse further investments in sanitation. The affordability of these options is broadly shaped by the incomes of households and the financing available from the government or other funders, and the cost of loan finance. This paper outlines specific factors and processes that SDI affiliates have identified that can improve access to sanitation and influence affordability for low-income urban communities.
1. Overview

Sustainable Development Goal (SDG) 6 presents an ambitious target to provide access to adequate and equitable sanitation for all. The current situation in many sub-Saharan cities is dire. Although 2.1 billion people worldwide gained access to an improved source of sanitation between 1990 and 2015 (JMP 2015), sub-Saharan Africa missed the Millennium Development Goal (MDG) target to halve the proportion of its population without sustainable access to safe sanitation. Furthermore, there has been limited or no progress around the percentage target in Zambia, Zimbabwe, Tanzania and Malawi - the countries where the Sanitation and Hygiene Applied Research for Equity (SHARE) City-wide Sanitation Project cities are.

Figure 1: Sanitation provision in SHARE City-wide Sanitation Project countries

Data source: UNICEF and WHO (2015)
The limited progress around percentage of urban population with improved sanitation reflects the growing populations in urban areas and the challenges in financing the maintenance and development of sanitation infrastructure. The total figures reveal how some Sub-Saharan countries have doubled, tripled or even quadrupled urban populations. Universalising access in light of the cumulative impacts of insufficient investments and financing poses particular challenges in cities that have urbanised without formal sanitation infrastructure. This paper explores some of the reasons behind the funding deficit, and how this continued absence of funding at best influences the scalability of community-led sanitation solutions.

Low-income households rely on a range of on-site and decentralised forms of sanitation. As part of the action research funded under the SHARE City-wide Sanitation project, this paper documents how federations of the urban poor have sought to identify their sanitation needs and develop appropriate sanitation solutions. The affordability, and consequent scalability, of these options is broadly shaped by the incomes of households and the financing available from the government or other funders, and the cost of loan finance. This paper outlines some of the specific factors and processes identified by SDI affiliates that can improve access to sanitation and influence affordability for low-income urban communities.
2. Approach and methodology

The action research project was developed to complement and scale up the federations’ existing sanitation efforts in Chinhoyi, Dar es Salaam, Kitwe and Blantyre. Recognising the challenges that both public and market-driven approaches have faced in addressing the sanitation needs of the urban poor, this project presented an opportunity to consider the scope that community-driven approaches have to meet the needs of low-income groups. In phase one each alliance produced a succinct situational analysis outlining existing sanitation conditions and challenges (Mkanga and Ndezi 2014; CCODE and MHPF 2014; ZHPF et al 2014; PPHPZ and ZHPPF 20142). In line with the findings in phase one, phase two saw an array of practical sanitation precedents rolled out in each city that are discussed in this paper. Phase three supported each affiliate to build on the precedents, deepen partnerships with local governments and roll out city-wide sanitation strategies.

The SHARE City-wide Sanitation project has drawn on SDI’s approach to sanitation using its tools or rituals (e.g. enumeration surveys and profiles, women’s led savings, incremental construction, community-driven design and management), which draw on the value and experience of urban poor communities. Its precedents build on the federations’ previous engagement with sanitation and existing construction programmes that advocate an affordable and incremental approach to informal settlement upgrading.

Throughout the course of this project, stakeholders have reflected on the progress made to develop community-driven sanitary improvements through meetings, international workshops, presentations and reports, according to four of the principle challenges that have often thwart community-driven approaches, specifically:

1. The collective action challenge of getting local residents to coordinate and combine their demands for sanitary improvement. This is discussed in significant detail in a subsequent paper (SHARE, forthcoming)

2. The co-production challenge of getting the state to accept community-driven approaches to sanitary improvement, and where necessary to co-invest and take responsibility for the final waste disposal

3. The affordability challenge of finding improvements that are affordable and acceptable to both the state and the community - and to other funders if relevant

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2 CCODE: Centre for Community Organisation and Development; MHPF: Malawi Homeless People's Federation; ZHPF: Zimbabwe Homeless People’s Federation; Zambian Homeless People’s Federation: ZHPPF
4. The trans-sectoral challenge of ensuring that other poverty related problems, such as insecure tenure, do not undermine efforts to improve sanitation (McGranahan 2015).

This paper reflects on the finance deficit that undermines sanitation provision in sub-Saharan Africa, and considers the affordability of the community-led precedents that have emerged in response. Federations of the urban poor have sought to address the affordability challenge in the precedents that have been developed as part of the city-wide work in various ways. These has included encouraging local investments; participation and collective action around the development and management of sanitation; the incremental development of sanitation improvements; and leveraging partnerships with the aim of achieving co-production arrangements with local authorities underpinned by sufficient political support and resources.

2.1 A note on data collection

The data cited on incomes in this paper is sourced through the data collection strategies of the SDI ‘alliances’ between federations of the urban poor and non-governmental organisations (NGOs) in each country. As part of the situational analysis prepared by each country, profiles were conducted of selected settlements in each city - with selected data on incomes collected. In some cases, this data was further substantiated by information from previous enumeration surveys. While preparing sanitation situational analysis in each country, the federation leaderships have corroborated income data presented. As the city-wide project moved from action research to precedent preparation and construction, detailed data on income levels was used for project planning. This was particularly essential for planning subscription charges for communal facilities and loans for shared toilets. These processes involved substantive discussions by the federations around what would be affordable for their lowest-income members.

The data presented around incomes, especially that quoted from specific settlements (or a number of settlements) in which the city-wide project undertook data collection and precedent activities can be considered robust. When discussing city-wide data on informal settlements more formal sources of statistics have, in some cases, been used when alliance coverage has not achieved city-wide proportions. During the course of this project SDI, in line with its strategic plan, has significantly strengthened its data collection processes and outputs through the ‘Know your City’ project (SDI 2016).

With sanitation policy and investment focused on formal, gridded areas (even though they only make up a small percentage of the cities under discussion) information on coverage in informal slum settlements ranges from extremely limited to non-existent. In order to prepare cogent and innovative plans for addressing the massive capital shortfalls in the informal sector, baseline information was collected in the four study cities using settlement profiles and/or enumeration surveys (Patel et al 2012; Arputham 2013). The federations, with
technical support from affiliate NGOs, drove the data collection process. Coverage of informal areas varied in each city with past information also referenced to help establish a city-wide picture. Categories of inquiry varied in some specifics but general trends included: ascertaining coverage and types of sanitation provision; investigating monthly amounts invested on sanitation (usually per household) compared with monthly incomes; understanding relations between landlords and tenants; reporting on average household sizes and establishing waste removal practices and the level of council support. In addition, each country conducted a substantive review and analysis of existing sanitation policies and relevant literature.

In addition to data collection and analysis, all four cities produced maps highlighting various aspects of sanitation provision and circumstances in informal settlements. Maps produced included toilet distributions and types, conditions of existing facilities, locations of trunk infrastructure and costs invested in sanitation. Both data and maps were used to inform the sanitation precedents that were selected by communities to be piloted and that are described in the next section. Since this paper focuses on affordability and finance, the findings described primarily relate to these issues; where possible, existing national statistics have been shared to provide context.
3. Understanding the sanitation deficit in sub-Saharan Africa

Sub-Saharan Africa has been dogged by severe infrastructural deficits across the board, which manifest themselves in terms of quality, quantity and levels of access (Ajakaiye and Ncube 2010). African nations and development agencies have made a concerted effort to develop a better understanding of the quality, quantity and levels of access to infrastructure in sub-Saharan countries, and to consider how the deficit can be addressed on all three fronts. The Africa Infrastructure Country Diagnostic (AICD) programme sought to develop a more complete understanding of infrastructural provision, financial flows, and how donor and national finance could be mobilised to improve infrastructure in the region. This programme demonstrated that central government finance was the major driver of investment in infrastructure in all settings apart from fragile states, but that investments have been insufficient and infrastructure providing basic services often fails to serve the lowest-income households.

Furthermore, in instances where services are provided by public utilities, the public sector often fails to collect revenues for services or to operate efficiently or undertake maintenance. AICD contends that even if major efficiency drives were undertaken, there would still be US$ 31 billion worth of physical infrastructure deficits on the continent (Foster & Briceño-Garmendia 2010:1). These figures are based on research that sought to comprehensively document and map - using GIS - infrastructure networks and their relationship to physiographic and socioeconomic features. The AICD sought to assess the cost of spending, investment, rehabilitation and operation of new and existing assets in each sector. The investment and technologies considered for water and sanitation, as an example, included those recognised under the MDG target for water and sanitation (Foster & Briceño-Garmendia 2010:31-40). Even if the public good merits of sanitation have been recognised by the state, and infrastructure is available, there are often connection costs, and there are large proportions of the population who do not have the resources or entitlements to be able to access infrastructure for basic services.

Beyond the imperative to improve access to basic services, general infrastructural development has been promoted as a means of encouraging economic development and addressing inequality by donors and development agencies (Calderon and Serven 2010). Certain types of infrastructure, such as sanitation, have greater potential to promote economic growth than do others. However, sanitation has not been an appealing untapped lucrative market for the private sector, while public policies to addressing deficiencies have been poorly coordinated and ineffectively targeted. Consequently, there has been limited progress around increasing access to improved sanitation.
under the SDGs, particularly in sub-Saharan Africa. Furthermore, it is a sector that requires significant funding, and has been identified as having the largest funding deficit after energy by the AICD (see Table 1).

### Table 1: Overall Infrastructure spending needs for sub-Saharan Africa (US$ billions)

<table>
<thead>
<tr>
<th>Infrastructure sector</th>
<th>Capital expenditure</th>
<th>Operation and management</th>
<th>Total expenditure required</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT</td>
<td>7.0</td>
<td>2.0</td>
<td>9.0</td>
</tr>
<tr>
<td>Irrigation</td>
<td>2.9</td>
<td>0.6</td>
<td>3.4</td>
</tr>
<tr>
<td>Power</td>
<td>26.7</td>
<td>14.1</td>
<td>40.8</td>
</tr>
<tr>
<td>Transport</td>
<td>8.8</td>
<td>9.4</td>
<td>18.2</td>
</tr>
<tr>
<td>Water supply and sanitation</td>
<td>14.9</td>
<td>7.0</td>
<td>21.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60.4</strong></td>
<td><strong>33.0</strong></td>
<td><strong>93.3</strong></td>
</tr>
</tbody>
</table>

Source: Foster & Briceño-Garmendia 2010:7

Financing sanitation services is complicated, and there are competing ideas about who should pay for what part of the sanitation chain and how (O’Keefe 2015). This can vary significantly for residents in different parts of the city. Utilities charges for the removal and treatment of wastewater are usually bundled into water charges and so citizens can be unaware of the associated costs. In these instances, households might pay monthly fees for wastewater removal and treatment and for the cost of the toilet. Meanwhile in low-income settlements with insufficient sanitation infrastructure, households, NGOs and community-based organisations (CBOs) are left to invest in sanitation, including toilets and the collection and treatment of waste, although attempts to achieve scale are often undermined by financial, political and policy challenges (Tukahirwa et al 2013; Tukahirwa et al 2010).

The SDG on sanitation, which aims to universalise access to improved provision within the next 15 years, presents a significant challenge that thus requires substantial investments from the state. The AICD estimates that an average of 0.23% of gross domestic product (GDP) is spent on sanitation across sub-Saharan states. Meanwhile at the most recent African Conference on Sanitation and Hygiene (AfricaSan), nation states agreed that at least 0.7% of GDP would have to be spent on constructing and maintaining sanitation infrastructure in order for citizens to have access to improved sanitation, as defined by the joint monitoring programme (JMP) for the MDGs. This figure is now central to a commitment made by AfricaSan member states to increase spending on sanitation to 0.7% of GDP by 2020, where 0.2% is spent on upgrading and maintenance and 0.5% is spent on developing new infrastructure. While city-wide sewer systems can achieve sanitation and the associated environmental and health benefits at scale, sub-Saharan cities are faced with the challenge of updating partial, poorly maintained colonial sewers, as is the case in Harare, or to construct new sanitation infrastructure. The limited sewer construction that

*Sub-Saharan cities are faced with the challenge of updating partial, poorly maintained colonial sewers.*
happens in these instances tends to be preserved for the wealthiest urban communities, as is the case in Dar es Salaam, where less than 10% of the city has access to a sewer (Mkanga and Ndezi 2014). Furthermore, while sewers are an expensive technology, they often incur some of the lowest costs for households as costs are partly met by the state, although they have the scope to deliver health and environmental benefits at scale (Wankhade 2015).

In the absence of investments in sewers, and in locations without access to water, there has to be consideration of funding mechanisms that can support the development of on-site sanitation solutions, including the formalisation of ‘informal’ sanitation provision (van Dijk et al 2014). In the absence of formal sewerage systems, low-income communities use a range of facilities, and employ a range of changeable individual and collective toilets and wastewater management practices that are highly contextualised. Meanwhile, practitioners, policies and programmes often fail to grasp the varied and complex arrangements for the provision of toilets and waste management (Das 2015). The affordability and suitability of formal and informal on-site sanitation toilet and wastewater management arrangements deserve further attention as part of an incremental process of improving access to sanitation if substantial improvements to access are to be made. Equitable access to sanitation across the city is the end goal; gradual advances around low-cost technologies and appropriate governance arrangements for sanitation might be necessary steps on the pathway to this goal.

3.1 The funding challenge

The sums required to improve access to sanitation are not insignificant; indeed, as discussed, they are estimated to average 0.7% of GDP for each sub-Saharan African state. Utilities have a limited revenue base for investment, and limited capacity to secure financial credit, because it is difficult to guarantee returns on costly infrastructural development in contexts where citizens are unlikely to pay for sanitation. Consequently, risks involved in investments lead investors to impose higher interest rates on poorly performing southern utilities (van Dijk et al 2014). Households might be unable or unwilling to pay for sanitation for several reasons. They might be unable to afford to connect to or pay for services. Even if can afford to pay for sanitation, they might be unwilling to invest in it, particularly if they have lived in lower density regions in the past; it takes time to change people’s sanitation behaviours. Meanwhile households that are renting or without tenure security might also be unable to invest in upgrading sanitation (Scott et al 2013). This relates to the challenge identified as part of the SHARE City-wide project, and the scope that local residents have to coordinate and combine their demands for sanitary improvement through collective action.

The standards established around sanitation are often unaffordable to low-income communities, even if they effectively organise at the community level - meaning sanitation standards can even serve to exclude low-income households. Without including low-income groups in the development of
standards and/or providing subsidies, low-income households will not be able to afford sanitation of the appropriate standard (see McGranahan 2015 for further discussion). In practice, the responsibility for sanitation provision is at least partially devolved to the utility company. However, under-resourced local governments rarely have sufficient autonomy, finances or capacity to develop a detailed understanding of the basic service needs of communities (Fjeldstad and Heggstad 2012), or to reform antiquated planning regulations and bureaucratic structures. This makes it difficult for local governments to consider alternative technologies, which might be more appropriate, accessible and/or affordable for low-income communities, in the interim at least (Banana et al 2015b).

Development finance and development agencies could thus play a significant role in addressing both of these challenges; however, a WaterAid analysis of Organisation for Economic Co-operation and Development (OECD) data from 2003 to 2013 reveals that while volumes of official development assistance (ODA) have increased significantly in recent years, the share of ODA spent on water and sanitation has fallen when compared with other basic services (WaterAid 2015:11). While donor finance does not have the scope to fill the gap in public and private finance it is an essential financial source for many countries and can act as a stimulus for innovation and action research around infrastructure, sanitation financing and behaviour change if used effectively, particularly in least developed countries. As will be discussed in this paper, different components of the sanitation value chain - from capture to treatment and beyond - can be owned, managed, and financed in different ways by different actors in different settings and according to technologies adopted. The affordability and suitability of these arrangements for low income communities in particular deserves more attention as part of endeavours to improve access.

3.2 National sanitation policies and financing

The financial deficits that underpin poor access to sanitation in sub-Saharan cities are broadly linked to sectoral policy, programming and governance failures at national and city levels. Jurisdiction over and responsibility for developing and delivering sanitation services are often unclear, indicating that sanitation is rarely comprehensively framed as a public good in many sub-Saharan African states. Failing to clearly frame sanitation as a public good, set out through appropriate financing, a policy framework and appropriate governance mechanisms, means that the public good benefits of sanitation cannot be realised, and that there is confusion around who is responsible for its provision, management and financing. The funding gap thus becomes bound by national policy failures to recognise sanitation as a partial public good or to make investments to ensure that the public good benefits are equally distributed.

There is a need to identify new sources of finance, but also to develop more cost-effective approaches to sanitation, particularly on-site solutions for low income communities - or even to do both. Examples
of alternative forms of finance and local institutional arrangements have emerged to address the sanitation deficit, and evidence suggests that public financing, specifically subsidies for on-site sanitation, can play a significant role in creating demand for sanitation, supporting the development of sanitation entrepreneurs and alleviating affordability constraints (Trémolet at al 2010). In practice, existing finance and subsidies have been poorly targeted and frequently spent on developing and maintaining technologies that do not serve low-income and informal communities (Trémolet et al 2014).

The Orangi Pilot Project (OPP) is a well-documented example of a grassroots programme that sought to develop low cost technologies that would broker meaningful partnerships between low-income communities and the state in parts of Karachi, Pakistan. Communities would create ‘lane committees’ that would organise around the construction of simplified sewers at the level of the lane, which would then be connected to the mainline trunk sewer that was funded by the city. The co-production partnership that emerged would develop an affordable sanitation solution that sought not to use loans, and that was premised on scrapping the prohibitive standards for sanitation. The process that began in one settlement spread to over a million people in Karachi (Hassan 2006, 2008).

### 3.3 Community-driven processes for sanitation

Development goals that aim for universal access to sanitation will create new roles for different actors in various endeavours to develop affordable and accessible sanitation. There is clearly a need for more finance to develop sanitation infrastructure; meanwhile well-targeted ODA has the scope to support the development of more integrated policies and innovation in the sector. National governments are faced with the challenge of developing appropriate financial models for service provision. Then there is a well-developed and well-documented network of non-state actors that have been engaged in developing sanitation solutions at the local level to plug the service gap. This includes informal self-help solutions, community-driven approaches such as the Indian toilet blocks (Patel 2015) and the civil society-driven simplified sewers developed by the OPP.

Households and landlords often invest in on-site solutions to augment local provision, or to develop contained on-site solutions. The cost of installing and maintaining sanitation for low income households alongside the disincentive posed by neighbours who might not be able to install or maintain sanitation themselves further demonstrates the absence of affordable, appropriate public good solutions to sanitation challenges for low income communities. McGranahan (2015) outlines how better-organised communities can address public goods locally. Collective organising around shared sanitation services, within compounds or as part of public toilet blocks that are managed by the community, potentially presents the building blocks for such communities. Indeed, the exclusion of shared facilities from MDG

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“There is a need to identify new sources of finance, but also to develop more cost-effective approaches to sanitation.”

“Weell-targetted ODA has the scope to support the development of more integrated policies and innovation in the sector.”
targets linked to sanitation discounted collective endeavours that have, in some settings, proven to provide significant practical and strategic gains for low-income communities (Patel 2015). However, this might change as part of the monitoring and indicators under discussion for the SDG linked to sanitation. Collectively designed, constructed and managed toilet blocks might present the most tangible example of a community-driven sanitation process, as communities are engaged not only in the development of sanitation solutions, but also in their day-to-day management. The toilet management committees have the scope to engage strategically with government around sanitation policy, as observed through the work of the Indian Alliance who sought to have community-managed toilet blocks rolled out as part of the national sanitation policy in India (ibid).

There are further illustrations of how low-income communities have collectively organised to develop affordable sanitation solutions. One such example is around financing and ensuring that credit is available to low-income households that cannot access formal loans for sanitation. Low-income households are often willing to pay for some elements of the sanitation chain, although how much and how is deeply contextual; moreover, available information is limited and is somewhat contradictory. However, it is clear that limited finance is available for low-income households and communities to be able to improve sanitation solutions.

This paper now turns to consider how SDI affiliates have sought to develop affordable and appropriate sanitation precedents in four cities, beginning by considering the policy frameworks and financing arrangements in each country to understand the context in which city authorities and utilities are operating. Then, drawing on the data gathered by SDI affiliates in each country, we outline the sanitation situation for low-income communities in each of the cities. We then consider certain precedents that have been developed in response to the sanitation needs identified in the sanitation situational analysis, paying particular attention to the affordability of each precedent for low-income groups.
4. Sanitation policy frameworks and financing

The nations in which the study cities are located face considerable deficits in sanitation in urban areas (see Figure 1). In this context, governments have sought to respond. The paragraphs below explain their vision for the sector, the government structures through which improvements are sought and implementation plans.

4.1 Tanzania

4.1.1 Sanitation overview

The Tanzania Development Vision 2025 sets out the country’s long-term water and sanitation targets, which include improving coverage of sewerage services from 18% in 2010 to 22% in 2015, and increasing basic sanitation from 86% in 2010 to 95% in 2015 (United Republic of Tanzania 2012). These targets are ambitious; large parts of the city are not connected to sewers and rely on informal and on-site sanitation, and the sector faces significant challenges around the policies and institutions that govern the sector. The water and sanitation sector is highly fragmented, and sanitation and hygiene policies and regulations are embedded in a number of Tanzanian institutions leading to poor coordination and the absence of a cohesive ‘vision’ or planning for sanitation services. This is further complicated by conflicting institutional arrangements that lead to competing approaches to service provision, and by insufficient funding.

A new national sanitation policy (2015–2023) has been drafted, and its salient points related to urban sanitation include better coordination between institutions, clearer roles and responsibilities, private sector investments in sewerage, increased budget allocations to local authorities and community participation in cleaning up formal and informal areas. However, the draft policy does not specifically address rapid urbanisation patterns and the lack of safe and functional sanitation systems for the urban poor.

4.1.2 Sector financing

The Ministry of Finance and Economic Affairs is responsible for financing water and sanitation with 85% of funds coming from international development partners and 15% from government revenue. The Water Sector Development Programme (WSDP) was initiated in 2007 to improve the sector, includes both government and donor funds and has an annual budget of approximately US$ 951 million. Contributors
to the fund include the African Development Bank, the German Development Bank and the Royal Netherlands Embassy, with sanitation and sewerage falling under components 2 and 3 of the WSDP. Other funders include the Ministry of Health and Social Welfare and various civil society partners (Mkanga and Ndezi 2014).

National-level funding has largely been spent on developing sewerage and wastewater treatment with hardly any budgetary allocations to onsite sanitation hardware, which implicitly excludes low-income communities from benefitting from such funding. The existing sewer network serves only 10% of the Dar es Salaam population while only 3% benefits from wastewater treatment, yet 99% of public investment in sanitation is allocated to sewerage. Overall, only 0.9% of public funding on capital investments is spent on on-site sanitation services - which are the sanitation solution for 83% of the population. Likewise, wealthier households who have access to sewerage and treatment services effectively benefit from 99.1% of public funds invested in sanitation infrastructure (WaterAid 2013).
Box 1: Sanitation finance flows in Dar es Salaam

**Sewerage services:** Financing from tariff revenues and other sources is allocated via the two publicly owned utilities - Dar es Salaam Water and Sewerage Authority (DAWASA) and Dar es Salaam Water and Sewerage Corporation (DAWASCO).

**Financing sources DAWASCO:** DAWASCO accrues the majority of its revenue from sewerage tariffs and only charges customers who are connected to the formal system. Charges are set by the Energy and Water Utilities Regulatory Authority.

**Financing sources DAWASA:** DAWASCO operates under lease from DAWASA. This fee is intended to cover DAWASA’s operational costs and service debt but has not been paid consistently. Repayments have improved since 2009 and negotiations are underway to collect outstanding debt. Using the WSDP both donors and national government fund capital investments that are channelled through DAWASA. DAWASA is implicitly subsidised by the state.

**On-site sanitation:** Investment is predominantly from individual households, as latrines are understood to be a private responsibility. Limited municipality funding is predominantly spent on promotional activities and site inspections.

**Municipal finance:** Funding, from a variety of sources, is extremely fragmented and often attached to very specific guidelines about how money should be spent. Under the WSDP, municipalities have been assigned up to TZS 20 million to conduct “soft” promotional activities. In reality, only around 60% of these funds have been disbursed to Dar es Salaam’s three municipalities. Although disbursements are said to be related to performance in sanitation and hygiene marketing they have proven to be erratic and unpredictable.

**Other sources:** When compared with government investment, donor funding in the sector is significant. NGO-led projects, both under and before the WSDP, have carried out substantive sanitation work (e.g. latrine provision and the training of artisans).

**Donor funding:** Tanzania has been one of the top 10 recipients of donor finance for water and sanitation, receiving 2.6% of all ODA dedicated to water and sanitation (WaterAid 2015:60). The WSDP, initiated in 2007, includes both government and donor funds, has a budget of approximately US$ 951 million and receives funds from the African Development Bank, German Development Bank and Royal Netherlands Embassy among others.
4.2 Zimbabwe

4.2.1 Sanitation overview

Since independence in 1980, Zimbabwe’s existing urban water and sanitation sector has been in decline. Multiple political and economic crises during the 1990s and 2000s have meant that existing infrastructure has fallen into disrepair and there has been insufficient investment to extend service provision to reflect the growth in urban populations; urbanisation was measured at 38% in 2010 (Zimstat 2010). This has led to a gradual increase in open defecation and the 2008 cholera outbreak. Since 2012 the water, sanitation and hygiene (WASH) sector in Zimbabwe has undergone significant institutional reform. Responsibility for water and sanitation has shifted to the Ministry of Water Resources Development and Management headed by Zimbabwe’s Deputy Prime Minister. In 2012 the “Strategy to Accelerate Access to Sanitation and Hygiene” was adopted with national government taking a key interest in sector reform and improved coordination.

The government has reclassified and clarified the ministerial roles with responsibilities for the sector following a series of workshops in which a coordination framework was agreed. The Ministry of Water Resources Development and Management is responsible for leading this sector and chairing the new National Action Committee; it will also monitor implementation of the policy through the Zimbabwe National Water Authority. Further roles and responsibilities are summarised in Box 2.

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**Box 2 Summary of sector roles under the “Strategy to Accelerate Access to Sanitation and Hygiene”**

- **The Ministry of Health and Child Care** is tasked with overseeing rural sanitation, environmental health education and public health.

- **The Ministry of Local Government, Rural and Urban Development** is the parent ministry for both rural and urban councils. It is responsible for establishing guiding policies and supporting urban and rural council’s regulatory frameworks.

- **The Ministry of Transport, Communications and Infrastructure Development** through the Department of Infrastructure Development supervises work on rural infrastructure.

- **The Ministry of Environment, Water and Climate** enforces environmental laws through the Environmental Management Agency.

- **The District Development Fund** provides rural water supply and maintenance.
Figure 2: Ministerial coordination structure for WASH in Zimbabwe

Note:
- **AfDB** = African Development Bank
- **DDF** = District Development Fund
- **EMA** = Environmental Management Agency
- **EU** = European Union
- **GTCA** = German Technical Cooperation Agency
- **MoLGRUD** = Ministry of Local Government Rural and Urban Development
- **MoA** = Ministry of Agriculture, Mechanization and Irrigation Development
- **MoE** = Ministry of Energy and Power Development
- **MoEN** = Ministry of Environment and Natural Resources Development
- **MoF** = Ministry of Finance
- **MoHCC** = Ministry of Health and Child Care
- **MoTCID** = Ministry of Transport Communication and Infrastructure Development
- **MoWAGCD** = Ministry of Women’s Affairs Gender and Community Development
- **MoWRDM** = Ministry of Water Resources Development and Management
- **NAC** = National Action Committee
- **NCU** = National Coordination Unit
- **NGO** = Non-governmental Organisation
- **WB** = World Bank
- **WASH** = Water, Sanitation and Hygiene
- **ZINWA** = Zimbabwe National Water Authority
Despite substantive reforms over the last few years, change has been slow and hampered by insufficient investment underpinned by economic crisis. Furthermore, roles and responsibilities remain divided between various ministries hampering coordination; work has largely focused on rural areas with urban challenges receiving little attention; research and development remains an area of neglect; and projects remain isolated and not integrated into an overarching strategic plan for the WASH sector. Furthermore, little innovation in alternative technologies means that Zimbabwean cities are stuck with the high capital and maintenance costs of centralised waterborne systems that are all too often in a state of disrepair. This is further entrenched by outdated sanitation planning regulations that make it difficult to develop and roll out new sanitation technologies.

4.2.2 Sector financing

National government has been challenged by the limited financial resources available to the sector. In a study undertaken by the WSP in 2011, it was estimated that Zimbabwe faced a capital investment gap of US$ 272 million per year, relative to the US$ 325 million per year required to meet national sanitation targets (WSP 2011:26). Despite financing challenges at a national level, Chinhoyi Municipality has benefitted from the government’s strategy to accelerate access to sanitation and hygiene. Over and above an increased allocation from national government, clearer coordination among donors, as articulated in the document, has led to the German Development Agency investing in a rapid appraisal of Chinhoyi’s existing water and sanitation system. National government, through the Public Sector Investment Programme, invested US$ 2.9 million in the regeneration of sewerage services in the city. While the funds were earmarked for the rehabilitation of sewerage treatment plants and the main sewer pipes, very little was actually done in formal/planned areas, while no impact was made in informal settlements in Chinhoyi.

4.3 Malawi

4.3.1 Sanitation overview

In Malawi the main bodies responsible for sanitation are the Ministry of Irrigation and Water Development, the urban water boards, rural district assemblies and local councils. Donors and civil society are also active in the sector and fund a wide variety of projects, either independently or working within government structures. The Local Government Act (1998) outlines local councils’ sanitation-related responsibilities while the Waterworks Act 1995 and the new National Sanitation Policy provide mandates for water boards. The Ministry of Health also plays a role in the sector promoting hygiene education around water and sanitation. While ‘soft’ social initiatives are common, the installation of ‘hard’ physical infrastructure, especially for the peripheral poor, has been neglected, with the majority of investments going to rural sanitation.
As in Zimbabwe and Tanzania, the roles and responsibilities of the divergent stakeholders tasked with sanitation provision are not well coordinated, with divergent and often conflicting plans and targets. This has often been a cause of conflict between local governments and water boards. Local government on-site sanitation (e.g. pit latrines and septic tanks) are within the remit of public health departments while sewerage infrastructure falls with engineering departments. These departments often work independently of one another (Manda, 2009). To further complicate matters, while water and sanitation provision are clearly interlinked, the services are bundled together, yet sanitation provision would benefit from more clearly targeted policies and interventions. In 2010 a Sector Performance Review was undertaken to prepare an action plan for improving performance and coordination.

4.3.2 Sector financing

Financing predominantly consists of public funding through the national budget and donor support. WASH NGOs invested approximately US$ 19.1 million between 2010 and 2012 (WES Network Performance Report, 2012). Table 2 illustrates resource allocation to the Irrigation, Water and Sanitation sector between 2010 and 2015. Increases and decreases are related to donor funding, which is likely to wind down in 2015 as projects funded through the National Water Development Programme begin.

Blantyre City Council has to raise its own revenue through ground charges, rental fees, market investments and other activities. The Department of Health and Sanitation is responsible for sanitation provision in the city and prioritises waste collection in formal, gridded areas. The department has no formal budgetary dispensation for the city’s informal settlements however the Malawian Alliance has been able to access upgrading finance through Community Development Funds in Blantyre.

4.4 Zambia

4.4.1 Sanitation overview

The regulation of the WATSAN sector, in particular the provision of services to peri-urban peripheral areas, is managed through the Ministry of Local Government and Housing and the Ministry of Mines, Energy and Water Development. The Ministry of Local Government and Housing has an overall mandate to coordinate water supply and sanitation provision through local authorities; it also manages both

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3 The main findings of the review, which covered both the water and sanitation sectors, were that there was poor coordination between different institutions in the sector and a need to collectively define WASH indicators for Malawi. The process led to the development of the National Water and Sanitation Plan and a variety of technical working groups. For more information see http://www.rural-water-supply.net/_ressources/documents/default/1-504-3-1369649610.pdf

4 Water and Environmental Sanitation Network
grant and loan investments to local authorities. It has created both a rural and urban water and sanitation programme. The Ministry of Mines, Energy and Water Development provides WATSAN services to independent providers, commercial utilities and local authorities. In addition, the Ministry of Lands, Environment and Natural Resources establishes environmental standards, some of which are related to sanitation (e.g. effluent discharge and uncontrolled storm drainage). Box 3 summarises the regulatory framework and institutional roles and responsibilities in the sector.

A variety of acts, institutional frameworks and policies govern the sector. Implementation, especially in terms of engaging with informal urban networks, has been neither equitable nor efficient. Most informal settlements are considered illegal and fall outside the “formal” boundaries of local authorities. For example, while the Devolution Trust Fund is meant to finance water and sanitation services in informal peri-urban areas, informal settlement dwellers have little say in how and where it is used - and in fact the vast majority are completely unaware of its existence. Another issue with the Water and Sanitation Act is the lack of urgency around “universal coverage” with a focus on providing WATSAN services only to those who can afford to pay.

4.4.2 Sector financing

The sector is financed through a combination of government and donor funds with donor contributions accounting for almost 90% of total expenditure. Table 3 lists donor contributions to the sector in 2011/2012.

Table 2: Sources of donor funding to the Zambian WATSAN sector

<table>
<thead>
<tr>
<th>Source</th>
<th>Project name</th>
<th>Implementing agency</th>
<th>Disbursement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperating Partner and Grants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AfDB</td>
<td>Central province 8 centres WASH</td>
<td>MLGH</td>
<td>USS 0.40m</td>
</tr>
<tr>
<td>Denmark</td>
<td>Water and Sanitation</td>
<td>MLGH/MEWD/DTF/NWASCO</td>
<td>USS 7.61m</td>
</tr>
<tr>
<td>EU</td>
<td>Implementing of integrated water resource management in Zambia</td>
<td>GRZ</td>
<td>USS 0.24m</td>
</tr>
<tr>
<td>Germany</td>
<td>Devolution Trust Fund, phase III, Urban Water Supply Eastern Province, phase II, GRESP Groundwater Management Lusaka (BGR)</td>
<td>MLGH</td>
<td>USS 1.50m</td>
</tr>
<tr>
<td></td>
<td>Study and expert fund VI</td>
<td>GRZ</td>
<td>USS 0.28m</td>
</tr>
<tr>
<td></td>
<td>Water Sector Reform Program</td>
<td>MEWD</td>
<td>USS 2.73m</td>
</tr>
<tr>
<td>Japan</td>
<td>Improvement of Water Supply Condition in Ndola city</td>
<td>MLGH</td>
<td>USS 0.77m</td>
</tr>
<tr>
<td></td>
<td>Support in National Roll-out of sustainable Operation and maintenance Programme (SOMAP 3)</td>
<td>MLGH</td>
<td>USS 0.50m</td>
</tr>
<tr>
<td>Ireland</td>
<td>Rural water and Sanitation Northern Province (Province Administration and 4 Districts)</td>
<td>Care International /Chambeshi WSC</td>
<td>USS 0.41m</td>
</tr>
</tbody>
</table>

The Zambian government also provides some finance to the sector with money channelled through relevant ministries to the National Water Supply and Sanitation Council, which in turns disburses funding to local authorities, commercial utilities and the Devolution Trust Fund. Processes are complex and hampered by bureaucratic delays.

The Devolution Trust Fund was established in 2006 by central government as a multi-donor basket fund to resource commercial utilities in providing services to peri-urban informal areas. A number of projects have been implemented through the fund but, in general, most decision-making power lies with the commercial utilities, which do not include poor communities in project design and decision-making. The urban poor hence become passive beneficiaries of ‘top-down’ interventions that they have had little say in. The implications of this approach will become all too apparent in section 5.4 when the paper discusses the impact of the project in Kitwe, Zambia.
5. Sanitation needs and access as mapped by the urban poor

This section draws on situational analyses that were undertaken by SDI affiliates in each city to understand the reality of sanitation provision for low income communities beyond the JMP figures outlined in Table 2. It considers the institutional arrangements for the delivery of sanitation services, the financial details and the nature of sanitation provision in the cities. It also considers how tenure and living conditions intersect with sanitation, and the incomes of low income and informal households. This income information is critical to assessing the affordability of sanitation in section 6.

The ambition of SDI is to identify interventions that have the potential to deliver sanitation at scale to households in need. As argued at the beginning of this paper, there are four key constraints or challenges. Affordability is only one of these, and as elaborated in section 6, precedents have also had to deal with building a consensus around plans and implementation within the community, drawing in the state and managing the trans-sectoral challenge. Table 3 shows the number of people in the four cities living in informal settlements and in need of sanitation improvements.

Table 3: Indicators of the scale of need

<table>
<thead>
<tr>
<th>City</th>
<th>Population of the city</th>
<th>Number of informal settlements</th>
<th>% of people living in informal settlements</th>
<th>% of city population with no or inadequate sanitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blantyre</td>
<td>Est. 850,000</td>
<td>21 recognised by the local council</td>
<td>75%</td>
<td>67%</td>
</tr>
<tr>
<td>Chinhoyi*</td>
<td>79,368</td>
<td>16</td>
<td>44%</td>
<td>35%</td>
</tr>
<tr>
<td>Dar es Salaam</td>
<td>4,364,541</td>
<td>297</td>
<td>75%</td>
<td>60%</td>
</tr>
<tr>
<td>Kitwe</td>
<td>522,092</td>
<td>48</td>
<td>32%</td>
<td>38% (based on 77% of those in informal settlements)</td>
</tr>
</tbody>
</table>

*For Chinhoyi, these are previously formally planned low-income settlements rather than informal settlements.

5.1 Dar es Salaam

5.1.1 Contextual summary

Tanzania is characterised by high rates of sanitation coverage, with 82% of rural and 98% of urban households having latrines (Mkana and Ndezi 2014). In cities, traditional pit latrines (normally unimproved and shared) are used by approximately 50% of the population. In highly congested informal areas such unimproved latrines pose numerous environmental and health challenges and are only marginally better than open defecation practices. Since government sewerage services do not normally extend to informal areas, the removal and treatment of sanitary waste is a significant challenge. The high degrees of informality that characterise the sector reveal how investment has focused on developing sewers for the centre of cities, and the limited investments in alternative technologies for low-income and informal settlements.

These Tanzanian sanitation deficits are reflected in Dar es Salaam. A study conducted in 45 wards across the city revealed that between 71.7% and 97.3% of informal residents lack access to improved sanitation (Penrose et al 2010). Existing pit latrines often collapse or overflow, flooding settlements with excreta and wastewater. The city provides very limited and unaffordable waste collection services, citing the density of informal settlements as a constraining factor in the supply of vacuum emptying trucks. Within this project, research was conducted in all three of Dar es Salaam’s municipalities: Temeke, Ilala and Kinondoni.

The situational analysis indicated an extremely high number of tenants and very few home owners. A typical compound in Dar es Salaam’s informal settlements includes a house with between 3 and 7 rooms; in some cases, there are up to 10 rooms. Each room accommodates one household with an average of four members. These households share facilities such as the latrine, bathroom (if separate from the latrine) courtyard, a kitchen, a water tap (if available), string for hanging washed clothes and so on. Approximately 80% of landlords surveyed had no formal tenure.

The situational analyses undertaken by the Tanzania Alliance for Dar es Salaam reveals that informal residents use a wide array of latrines including pit latrines, eco-san pour flush and septic tanks. 65% of households interviewed have traditional pit latrines and 26% use pour flush toilets. Other types of latrines include car tyre and tin-lined latrines (4.2%), septic tanks (2.2%) and ventilated pit latrines (0.7%). Those collecting the household data observed that most latrines are incompletely built, poorly designed, in a dilapidated condition, unroofed, lack water facilities and, in general, are not maintained.

5 The pit is commonly round in shape but may also be rectangular or square. Round pits are preferred because they are more stable than rectangular/square pits. Some pits are lined while others are unlined depending on soil stability. Pit lining materials can include bricks, concrete rings, stones, old car tyres, drums or mortar plastered onto the soil. Normally the pits are sunk to a depth of between 10–12 feet but in areas with high water tables, shallow pits are common. In some cases, pits are raised on a foundation to overcome the high water table and high risk of flooding.
Findings indicate that 49.9% of households have built latrines in an area with a high water table affected by frequent flooding and 26.2% of households have experienced a collapsed pit latrine. There have been a number of reported cases of people drowning because latrines have collapsed. Many latrines are old. Latrines older than 10 years may have cracked floors, walls and pits. Normally such latrines have a high risk of collapsing leading to overflowing sludge and environmental pollution. Residents interviewed note that they cannot afford to replace ageing infrastructure due to both costs and lack of space.

Table 4: Age of latrines in study area

<table>
<thead>
<tr>
<th>Age of latrine</th>
<th>Number of respondents</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t know</td>
<td>73</td>
<td>6.2</td>
</tr>
<tr>
<td>5 years or less</td>
<td>331</td>
<td>28.1</td>
</tr>
<tr>
<td>6-10 years</td>
<td>230</td>
<td>19.5</td>
</tr>
<tr>
<td>11-15 years</td>
<td>164</td>
<td>13.9</td>
</tr>
<tr>
<td>16-20 years</td>
<td>164</td>
<td>13.9</td>
</tr>
<tr>
<td>21-25 years</td>
<td>74</td>
<td>6.3</td>
</tr>
<tr>
<td>26-30 years</td>
<td>66</td>
<td>5.6</td>
</tr>
<tr>
<td>30+ years</td>
<td>76</td>
<td>6.5</td>
</tr>
<tr>
<td>Total</td>
<td>1,180</td>
<td>100</td>
</tr>
</tbody>
</table>

5.1.2 Costs and affordability

In terms of expenditure, the Tanzanian Alliance has indicated that 13.7% of land owners spent more than TZS 400,000 on toilet construction, while 13% of respondents spent less then TZS 50,000. From focus group discussions it appears that most latrines costing less then TZS 100,000 are old, dilapidated, use inferior material and are un-roofed. 15.2% of households interviewed do not recall latrine construction costs. Estimates of current construction costs range between TZS 400,000 and TZS 1,500,000. Of landlords interviewed, 58.6% cited financial constraints as the main reason for a lack of new toilets and/or improvement of existing latrines.

If the slum dwellers in need of improved sanitation in Dar es Salaam are tenants, then the issue of affordability becomes more complex. Investments are not simply about what is affordable but also about what contribution tenants may be willing to make towards improving their sanitation. Relations between landlords and tenants need to be carefully considered and negotiated when assessing affordability and piloting projects. The Tanzanian Alliance has explored this issue in some detail and the construction of latrines involves negotiations (often mediated by local leaders) between landlords and tenants to reach an agreement on mode of financing.

The issues included aspects of land availability, tenure problems and poor landlord-tenant relationships. The project explored land ownership arrangements where, in some scenarios, landlords had to share land with their neighbours to create space for latrine
constructions. Moreover, there are situations in the case of absentee landlords where the tenants have decided to improve the latrines and have negotiated the repayments to be deducted from their rents. Many landlords felt that investing in sanitation is expensive and many could not afford to do so, while tenants were concerned that any investments could lead to rent increases. The precedents address the issue of financing by providing loans for toilet improvement and by brokering negotiations between landlords and tenants to ensure that the costs would not manifest in rental increases for the duration of the loans. Thus they address the issue of finance as residents are able to access loans for sanitation improvement.

Pit emptying remains a key challenge in informal areas. Findings indicate that when pits are full 31.4% of households dig a new pit, 23% hire a vacuum truck while 9.6% open drain the pit during the rainy season. Focus group discussions reported that pit-emptying costs could be up to TZS 300,000 depending on road access, costs of required latrine repair (as emptying often involves the partial destruction of the existing latrine) and the cost of labour. However, increasing settlement densities limit space and therefore limit the construction of new latrines. Tables 5 and 6 summarise the challenges and costs involved in pit emptying.

Table 5: Pit emptying challenges

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Number of respondents</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of funds</td>
<td>252</td>
<td>21</td>
</tr>
<tr>
<td>Lack of space for emptying equipment or to empty to</td>
<td>222</td>
<td>19</td>
</tr>
<tr>
<td>Lack of emptying technicians</td>
<td>49</td>
<td>4</td>
</tr>
<tr>
<td>Lack of emptying tools</td>
<td>47</td>
<td>4</td>
</tr>
<tr>
<td>Bad smell</td>
<td>303</td>
<td>26</td>
</tr>
<tr>
<td>Inconvenience of using neighbours toilet</td>
<td>97</td>
<td>8</td>
</tr>
<tr>
<td>No challenge</td>
<td>171</td>
<td>15</td>
</tr>
<tr>
<td>Other</td>
<td>38</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>1,180</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 6: Costs of emptying pit latrine (% of 1,180 respondents)

<table>
<thead>
<tr>
<th>Costs</th>
<th>% of respondents reporting this cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>150,000+</td>
<td>6</td>
</tr>
<tr>
<td>100,001-150,000</td>
<td>9.4</td>
</tr>
<tr>
<td>50,001-100,000</td>
<td>21.6</td>
</tr>
<tr>
<td>&lt;50,000</td>
<td>12.2</td>
</tr>
<tr>
<td>No cost</td>
<td>50.8</td>
</tr>
</tbody>
</table>

5.1.3 Incomes

Findings from the situational analysis indicate that 53.6% of households in the study areas are self-employed (e.g. trading, carpentry, building) while 27.7% were unemployed. Only 13% of households contain a member who is formally employed in government or the private sector at a relatively low level (e.g. gardeners and security guards). Table 7 presents indicative average monthly incomes drawing from data recently collected in Vingunguti, one of the settlements in Dar es Salaam in which a precedent (simplified sewerage) is being piloted.

Table 7: Average monthly incomes of residents in Vingunguti (2015)

<table>
<thead>
<tr>
<th>Income category</th>
<th>Number of respondents</th>
<th>Percentage of households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 50,000</td>
<td>314</td>
<td>27</td>
</tr>
<tr>
<td>50,001-100,000</td>
<td>273</td>
<td>23</td>
</tr>
<tr>
<td>100,001-150,000</td>
<td>240</td>
<td>20</td>
</tr>
<tr>
<td>150,001-200,000</td>
<td>146</td>
<td>12</td>
</tr>
<tr>
<td>200,001-250,000</td>
<td>55</td>
<td>5</td>
</tr>
<tr>
<td>250,001-300,000</td>
<td>78</td>
<td>7</td>
</tr>
<tr>
<td>300,001-350,000</td>
<td>38</td>
<td>3</td>
</tr>
<tr>
<td>350,001-400,000</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>More than 400,000</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>1,181</td>
<td>100</td>
</tr>
</tbody>
</table>

*At the time of the study US$ 1 was equivalent to TZS 1,600.*
Figure 4:
5.2 Chinhoyi, Zimbabwe

5.2.1 Contextual summary

Chinhoyi was established in 1906 and is one of Zimbabwe’s oldest towns. Like most colonial settlements the town is divided between the affluent homes built for white settlers and the more cramped accommodation of the majority black labour force. The population in Chinhoyi town has been steadily increasing and was 55,968 during the 2002 census and 79,368 according to the preliminary results of the 2012 census (Zimstat 2016). The Chinhoyi municipality adopted the mining compounds of Alaska and Shackleton after the Zimbabwe Mining Development Corporation closed operations in 2000.

Approximately 65% of settlements in Chinhoyi have some access to the existing sewerage network. However, irregular water supply has severely compromised existing waterborne sanitation systems forcing those in high-density, low-income communities to practise various forms of open defecation (e.g. bucket system). Increasing population and the addition of new suburbs to the municipality’s administrative area have placed additional pressure on an existing system that is in dire need of maintenance and expansion. Sewer pipe bursts are common, especially in poorer, informal areas. Designed for a smaller population and not adequately maintained, the sewerage system has suffered chronic mechanical and maintenance problems resulting in raw effluent being pumped into the Manyame River - a serious health risk to communities downstream.

Needs are particularly acute in Alaska and Shackleton where mining companies shutting down left a gap not only in employment but also service provision. The mining company had invested in water and sewerage networking to service the compounds that housed the workers. But once the two mines were closed due to declining viability and management problems, the water and sewer systems were left unattended, so they gradually deteriorated and finally collapsed. Currently the two mining towns have no networked water and waterborne sanitation.

Informal communities in Chinhoyi use a variety of sanitation systems including water-dependent flush toilets (in reticulated areas), pit latrines, Blair toilets and open defecation. This is due to the irregular water supply and the poor condition of the existing waterborne systems.

Almost 80% of pit latrines surveyed were of extremely poor quality and prone to collapsing during the rainy season. 82% of settlements profiled have no waste collection services. The communal toilets surveyed in Mpata and Gadzema were constructed during the colonial period and are in a very poor state of disrepair. Residents believe the onus should be on the council to clean and maintain sanitation facilities. However, the current condition of council-managed toilets clearly demonstrates that the authorities have been unable to meet this obligation.
In those settlements with communal facilities, the council charges residents a fixed water charge of US$ 17.00, a fixed refuse charge of US$ 3.45, a fixed sewerage charge of US$ 3.45 and supplementary charges of US$ 3.00, bringing the monthly bill to US$ 26.00. When billed, this figure is usually accompanied by interest on outstanding bills. Those with individual water and sanitation connections report a month bill of around US$ 49.00, made up of US$ 35.00 for water, US$ 8.00 for refuse and US$ 6.00 for sewerage.

In Shackleton, where a detailed household enumeration survey took place, 39% of those surveyed practise open defecation while 56% use unimproved pit latrines and 5% use the traditional waterborne system. The numbers practicing open defecation may be higher than reported as when the erratic water supply fails many people are likely to resort to open defecation; at the time of the survey the water supply was functioning. Through the enumeration it became clear that there was a correlation between tenure status and the sanitation option employed. In Shackleton 66% of those who practise open defecation are tenants while 24% are property owners’ relatives.

### 5.2.2 Incomes and costs

When asked about affordability, community members said they believed that they could pay between US$ 9.00 and US$ 15.00 per month as an inclusive figure for water, refuse and sewerage - an average of US$ 12.00 per month. The alliance used an enumeration survey to determine the status of various issues, namely affordability, tenure, preferred upgrading plan, rate of sub-letting, arrears to council and reasons for not paying, and state of structures. From this it became clear that most families earn less than US$ 200 per month hence the repayments are very low. Additionally, the council rates of between US$ 26 and US$ 30 per month for water make it more difficult for families to repay sanitation loans.
5.3 Blantyre

5.3.1 Contextual Summary

Blantyre is Malawi’s commercial centre with a day population of over 1 million\(^6\) and a growth rate of 2.8%. Over 65% of the city’s residents live in 21 informal settlements that occupy about 23% of Blantyre’s land according to UN-Habitat’s Blantyre Urban Profile (2011). The Malawi Homeless People’s Federation contests this number and believes the percentage of people living in informal slums is 75%. Most informal settlements have little or no access to sanitation, clean water or solid waste collection while planned, formal areas have adequate access to these services.

The findings presented in this section are based on information collected, as described in the methodology section, from seven informal settlements across Blantyre\(^7\). The survey included 4,593 households and found that 54% of households rent, 41% own the property that they live in, and the remainder are relatives of property owners. Most property owners have their own private latrine and bathroom but tenants are expected to share a separate unit. Findings indicate that tenants are reluctant to make sanitation investments in properties they do not own.

Nearly three-quarters (73.7%) of households surveyed indicated having access to a toilet while 26.28% did not. Of households without a toilet, 63.43% use their neighbours’ toilets. 2.2% use the bush, 5.28% use the river, and 29.12% use public toilets. Over 90% of the toilets catalogued are unimproved pit latrines (see Table 8). Only 1.68 of those surveyed have septic tanks because of their high cost (MK 120,000\(^8\)). Less than 1% access the sewers.

Table 8: Types of toilets accessed

<table>
<thead>
<tr>
<th>Toilet type</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eco-san</td>
<td>9</td>
<td>0.2</td>
</tr>
<tr>
<td>Flush toilet with septic tank</td>
<td>68</td>
<td>1.7</td>
</tr>
<tr>
<td>Improved pit latrine</td>
<td>256</td>
<td>6.4</td>
</tr>
<tr>
<td>Unimproved pit latrine</td>
<td>3,660</td>
<td>90.6</td>
</tr>
<tr>
<td>Ventilated pit latrine</td>
<td>28</td>
<td>0.7</td>
</tr>
<tr>
<td>Flush toilet connected to sewer</td>
<td>16</td>
<td>0.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4,037</td>
<td>100</td>
</tr>
</tbody>
</table>

Out of the total of 2,976 households with access to a toilet, 971 (32.65%) indicated that they do not share their toilet; 448 that they share a toilet with one other household; 1,009 that they share a toilet

---

\(^6\) The evening population is estimated to be as low as 600,000.

\(^7\) 15 of the 21 informal settlements in Blantyre City were sampled for the study and given a month to consult internally before indicating whether they were interested in being part of the project. After consultations, seven settlements notified the Federation that they would like to be involved in the project.

\(^8\) At the time of the situational analysis, the US dollar to Kwacha conversion rate was 1 US$= MK 320.
with more than two families; and 309 that they share with one other family. 239 households gave no indication.

Community members noted that pits quickly fill up, often collapse during the rainy season and that the limited waste collection services provided by the council cost MK 8,000. Most landlords use their own funds to construct toilets of which the majority (which are basic unimproved pit latrines) cost below MK 10,000 (US$ 32). The cost of an eco-san toilet (Skyloo) attached to a bathroom constructed by the Malawian federation is MK 105,000 (US$ 328), while an eco-san toilet constructed by the Hygiene Village Project (a Malawian NGO active in the health and environmental sanitation sector) was MK 80,000 (US$ 250).

Despite the unsanitary conditions of the basic latrines constructed, their significantly cheaper costs make them an affordable option for informal communities who would often rather invest in a water connection at their homes then on-site sanitation. Communal toilets are far more affordable for low-income tenants.

5.3.2 Incomes

Average income levels of those surveyed are given in Table 9.

Table 9: Average income levels in settlements surveyed

<table>
<thead>
<tr>
<th>Income</th>
<th>Households</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than MK 4,000</td>
<td>355</td>
<td>8.34</td>
</tr>
<tr>
<td>MK 4,000-8,000</td>
<td>1288</td>
<td>30.27</td>
</tr>
<tr>
<td>MK 8,001-12,000</td>
<td>184</td>
<td>4.32</td>
</tr>
<tr>
<td>MK 12,000-16,000</td>
<td>29</td>
<td>0.68</td>
</tr>
<tr>
<td>MK 16,000+</td>
<td>1650</td>
<td>38.78</td>
</tr>
<tr>
<td>Not indicated</td>
<td>749</td>
<td>17.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4255</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
5.4. Kitwe

5.4.1 Summary of the present situation

Kitwe has 48 informal settlements in which over 50% of the urban population live. Of these settlements, 14 have been granted legal status by the city council, while 34 are illegal. The council has earmarked only 9 of the 48 informal settlements, almost all of which are on council land, for upgrading. Nkana Water and Sewerage Company (NWSC) is tasked with delivering water and sanitation services in Kitwe, Kalulushi and Chambishi. It was established through the Water Supply and Sanitation Act and began operating in 2000. It is wholly owned by two local authorities, Kitwe City Council (70% ownership) and Kalulushi Municipal Council, 30% ownership) and regulated by the National Water Supply and Sanitation Council. NWSC provides water and sanitation services to approximately 65% of the urban, gridded population.

NWSC’s sanitation networks only extend to low, middle and high cost formally planned settlements. In informal settlements such as Wusakile, Kawama and Chamboli, sanitation infrastructure is old and dysfunctional with a very small number of households having flush toilets. Federation profiles of conditions in 48 informal settlements indicate that 77% use traditional unimproved pit latrines. The federation estimates that there are 60,000 families in Kitwe who are in need of adequate/improved sanitation (PPHPZ and ZHPPF 2014).

Pit latrines in Kitwe using makeshift structures cost approximately ZMW 50 (US$ 10). Pits are often not lined and poor quality materials (e.g. sacks, waste timber and leftover iron sheets) are used to build the top structure.

5.4.2 Incomes

Profiles undertaken in Kitwe settlements indicate that monthly incomes are approximately ZMW 200 (US$ 40) per month or less. Rents may take up a considerable proportion of incomes. For example, in Kamatipa in 2012, 34% of people rent paying approximately ZMW 50 (US$ 10.00) per month - about 25% of monthly income. Findings note that households spend approximately 3-5% of their monthly income on services - mainly water, as the majority of informal dwellers are not connected to the formal sanitation system.
6. The challenge of affordability

The situational analysis summarised in the preceding section provided an opportunity for each alliance to propose a series of aspirational sanitation precedents to address the challenges described in each city. These community-driven precedents sought to respond to the needs of each community and to be affordable, support collective action, build co-production partnerships with local government, and respond to the trans-sectoral challenges that can undermine community-driven solutions.

The subsequent sub-sections explore sanitation precedents developed by SDI alliances in Malawi, Tanzania and Zimbabwe specifically in relation to their affordability. The affordability challenge has to be understood in the broader context of sanitation financing. Government finance in informal settlements has been low and the cities of Blantyre and Dar es Salaam are no exception. Traditionally governments have been reluctant to invest in informal settlements for fear of legitimating claims to land ownership. While there are indications that this reluctance is becoming less significant, their low levels of capital investments together with concerns about the ability of residents to pay for connections means that, as explained above, there has been very little public provision of sanitation. In Chinhoyi the situation is a little different; there are few informal settlements. However, existing provision in low-income formal settlements is limited and has declined dramatically in the context of economic recession and the limited government finance.

In the absence of state investments, households have struggled to provide themselves with sanitation. Yet without state provision there are limitations to their ability to make the required capital investments in on-site sanitation. Off-site sanitation is not possible without a high level of collective organisation. Many of the health benefits only emerge when large numbers of residents have access to sanitation and, in the absence of collective action, further deters households from prioritising sanitation. Furthermore, as discussed already, a high proportion of households are tenants and, in the context of under-provision by landowners, there are few options open to them. Nevertheless, the SDI federations are very aware of the need to improve sanitation provision. City federations worked with their national leadership and professional support NGOs to identify and explore improvements to their existing options.

Despite their commitment, the precedent development phase highlighted to the research team the challenge of affordability. As described below and elaborated in Banana et al (2015), the methodologies used by the alliances proved to be effective in both building a consensus for change at the settlement level (i.e. stronger collective action) and in linking to government agencies (i.e. stronger potential for co-production). However, the affordability challenge
appears particularly tricky. It was recognised from the situational analysis that affordability was limited. Discussions within SDI to establish indicative guidelines for affordability led to the figure of US$ 3–4 per household per month as a target for sanitation interventions if they were to be realisable by the majority of households in the settlement (Banana et al 2015:14).

Box 3: Reconciling grassroots processes with internationally financed programmes in Kitwe

The experiences of the Zambian Alliance demonstrate how government approaches can undermine grassroots sanitation initiatives. In Kitwe an existing African Development Bank-funded partnership between the Kitwe City Council (KCC) and the local utility company, NWSC, was scheduled to provide 1,000 free latrines to low-income residents in the same neighbourhoods targeted by the federation. This initiative pre-dated the SHARE project.

The Kitwe federation - People’s Process on Housing and Poverty in Zambia - had been seeking to partner with KCC and NWSC to assist in the development and rollout of latrines. They hoped that federation processes would add value to the programme in a number of key areas, ensuring that the sanitation infrastructure reflected local needs and thinking through approaches to financing that could scale up more effectively. The federation argued that providing the latrines free of charge would not generate a scalable process; and that scale was needed in Kitwe, where 60,000 families lack adequate access to sanitation. They argued that loan finances could revolve to scale up delivery, having a greater impact. They also argued that free toilets could entrench dependencies on external donor finance. Communities would have little ownership if they were not involved in the design, construction and management of the toilet facilities. It was argued that this “one-off” mode of delivery would not fundamentally alter sanitation development and governance for the urban poor, but rather embed the political and institutional norms of sanitation delivery in Kitwe.

Participation and collective action premised on federation rituals e.g. collective planning/design, linking the project to organised savings groups and expecting communities to contribute financially to the project, were suggested as means of realigning the project’s institutional underpinnings. Despite sustained negotiations over a period of five years, the federation was unable to link its processes to the existing KCC and NWSC project. Although the African Development Bank funds had been earmarked for almost five years and were under pressure to meet their grant obligations and build latrines, a compromise could not be reached.

The Zambian Alliance was unable to traverse the existing institutional norms or create the conditions for new modes of sanitation delivery to be trialled. Even when new avenues were
pursued, such as the rehabilitation and federation management of dilapidated market facilities, bureaucratic red tape hampered the process.

Over 18 months (between July 2013 and January 2015), a range of precedents were developed and rolled out including shared and communal toilets, simplified sewerage systems, sludge collection systems, repairs to dilapidated latrines and market eco-san toilets. Tables 10 and 11 provide an overview of the reach of the precedents, and Tables 12 and 13 summarise the affordability of individual precedents.

Table 10: Communal toilet blocks

<table>
<thead>
<tr>
<th>Location</th>
<th>Total</th>
<th>Number in markets</th>
<th>Users per day¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blantyre (primarily market-based)</td>
<td>5</td>
<td>5</td>
<td>150 (users per day)</td>
</tr>
<tr>
<td>Chinhoyi (primarily residential)</td>
<td>1</td>
<td>1</td>
<td>500</td>
</tr>
</tbody>
</table>

Table 11: Number of households and people reached to date not including communal blocks

<table>
<thead>
<tr>
<th>Location</th>
<th>Sanitation type</th>
<th>Sewerage</th>
<th>Pour flash</th>
<th>Eco-san</th>
<th>Gulper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dar</td>
<td>Toilets</td>
<td>42</td>
<td>36</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Dar</td>
<td>Households²</td>
<td>91</td>
<td>1170 (36)</td>
<td>67</td>
<td>1,260</td>
</tr>
<tr>
<td>Dar</td>
<td>People</td>
<td>450</td>
<td>4095</td>
<td>1,096</td>
<td>6,300</td>
</tr>
<tr>
<td>Blantyre</td>
<td>Toilets</td>
<td></td>
<td>783</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blantyre</td>
<td>Households³</td>
<td></td>
<td>2,349</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blantyre</td>
<td>People</td>
<td></td>
<td>14,094</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kitwe</td>
<td>Toilets</td>
<td>18</td>
<td>73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kitwe</td>
<td>Households⁴</td>
<td></td>
<td>126</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kitwe</td>
<td>People</td>
<td>144</td>
<td>763</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chinhoyi</td>
<td>Households⁵</td>
<td>20</td>
<td>69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chinhoyi</td>
<td>People</td>
<td>50</td>
<td>475</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8 Users reported are in addition to households in other tables.
9 Dar: Number of households has been calculated by adding all households who received toilets and the number of users. This information was collected during identification of beneficiaries and also during routine monitoring and evaluation data collection. The numbers include both completed toilets and those still under construction.
10 Blantyre: One toilet shared by three households and six people in each household.
11 Kitwe: At the minimum two households with an average family size of six use the toilets. Both landlords and tenants use toilets.
12 Chinhoyi: Households are multiplied by five to calculate the number of people. Please see Table 11 for numbers serviced through communal toilets.
<table>
<thead>
<tr>
<th>Table 12: Summary of precedent affordability for individual toilets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capital cost per household</strong></td>
</tr>
<tr>
<td>Shared compound improved pit latrines (Dar)</td>
</tr>
<tr>
<td>Shared eco-san (Blantyre)</td>
</tr>
<tr>
<td>Shared eco-san (Chinhoyi)</td>
</tr>
<tr>
<td>Shared toilets with sewers (Chinhoyi)</td>
</tr>
<tr>
<td>Individual eco-san (Kitwe)</td>
</tr>
<tr>
<td>Individual septic tanks (Kitwe)</td>
</tr>
<tr>
<td>Gulper emptying provision (Dar)</td>
</tr>
</tbody>
</table>
Table 13: Summary of precedent affordability for communal toilets

<table>
<thead>
<tr>
<th>Precedent Description</th>
<th>Capital cost total and per household</th>
<th>Running costs</th>
<th>Use of loans</th>
<th>Notes include govt. contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decentralised waste water treatment (Dar) (phase 1)</td>
<td>US$ 8,219 for 20 households; per household, US$ 126 for sewer and US$ 335 for toilet</td>
<td>US$ 2 per household per month of which 75 cents is maintenance and US$ 1.25 payment to utility company</td>
<td>Loans offered, land owners take on loans</td>
<td>Phase 1. Sewers provided free of charge. Some toilets improved (unit cost of US$ 250) and some rebuilt (unit cost of US$ 370)</td>
</tr>
<tr>
<td>Decentralised waste water treatment (Dar) (phase 2)</td>
<td>US$ 10,021 for 22 households; per household, US$ 131 for sewer and US$ 324 for toilet</td>
<td>US$ 2 per household</td>
<td></td>
<td>Phase 2. All costs covered through loan finance. Interest rate of 1% a month, loans up to three years. Some toilets improved (unit cost of US$ 250) and some rebuilt (unit cost of US$ 346)</td>
</tr>
<tr>
<td>Market eco-san toilets (Blantyre)</td>
<td>US$ 23,255 for ten stances</td>
<td></td>
<td>US$ 0.07 for a toilet and US$ 0.2 for a bath</td>
<td></td>
</tr>
<tr>
<td>Shared toilets in communal block (Chinhoyi)</td>
<td>US$ 16,500 for 60 households</td>
<td>Minimal</td>
<td>US$ 6.25 monthly payment</td>
<td>No interest charge and no deposit. Council provided US$ 7,500 and loan for remainder. Payments collected by the council and placed in city sanitation fund.</td>
</tr>
</tbody>
</table>

Ensuring that sanitation precedents were affordable presented one of the most important challenges; the affiliates sought to develop solutions that could be accessible to all. The precedents are developed as learning exercises rather than perfect solutions. They are designed to possess key elements with the potential for affordable replication. Precedents are undertaken with the active engagement of the local government wherever possible to provide the basis for co-learning about what might go to scale.

The emergence of co-productive efforts was slow and government contributions were minimal; however, in three of the four cities some progress was made. Federations envision precedents as catalysts for drawing in the financial and policy support of local authorities to scale up. That is, they understood the failure to provide sanitation for the urban poor as a governance failure, whereby the state has been unable to secure or channel funds effectively into the development of affordable, appropriate sanitation for low-income groups. By piloting financially, socially and technically innovative precedents they hoped to draw government into new partnerships around the development of appropriate affordable sanitation, with the potential to scale up access for the lowest-income families. The contribution of the government to support the provision of sanitation services for low-income households is central to SDI’s organising methodology,
and the innovations piloted are aimed at catalysing state support for community-designed interventions.

The trans-sectoral challenge was considerable but largely determined by factors beyond the control of each alliance. In the case of the precedents undertaken here, the trans-sectoral challenge was primarily related to tenure and water. With a high proportion of private tenants, investment in sanitation provision had to be agreed between tenants and land-owners. In some cases, shortage of water and/or the costs of water influenced the choice of options.

Affordability appears to be primarily related to four factors, in addition to income, that determine ability to pay. Firstly, affordability is related to costs that vary by technology (i.e. the cost of the physical investment). Secondly, it is related to the costs of finance (and the extent to which payments can be spread); thirdly, to cost sharing (i.e. the leveraging of other funds); and fourthly, to the priority given to the expenditure by the households. SDI precedents use a multiplicity of strategies to improve affordability. New lower-cost technologies may be introduced or the costs of existing technologies reduced through new innovations. These may be both physical technologies and/or social technologies to manage sanitation. The costs associated with finance are reduced both through savings (and the frequent requirement for a savings contribution) as well as access to loan finance to spread costs over several years. Leverage of additional monies - i.e. cost sharing - is an imperative for the federations. Finally, by demonstrating alternative approaches and advocating for sanitation, SDI groups seek to support households to prioritise sanitation investments.

The three precedents discussed below were selected after discussion with individual affiliates. The primary reason for selecting the communal block in Gadzema is to analyse the social innovations required for the introduction of a community-managed toilet block in council rented accommodation. New social technologies were required for a sanitation block to be managed by 60 households. This was a first for the federation in Zimbabwe, which was managing a very successful toilet block for market traders in the central market in Harare but had relatively little experience in residential sanitation blocks. In addition, a significant contribution was leveraged from the local authority, and the local authority was willing to be actively involved in collecting repayments and using them to seed a sanitation fund within the council.

The primary reason for selecting the simplified sewerage at Vingunguti is that the sanitation technology is new to the Tanzanian Alliance. As well as needing new social skills, it also requires new technical skills and new relations with the utility company that manages the water stabilisation ponds. While limited funds were leveraged, the new engagement with the utility company offers a potential for future collaboration with verbal commitments already in place. The alliance secured a verbal agreement with local authorities to expand the Vingunguti system during a SHARE City-wide project exchange meeting held with the other participating SDI affiliates and Tanzanian sector stakeholders in 2015.
The primary reason for including eco-san toilets in Blantyre is the size of the investment that has taken place and the extension of loan finance from federation to non-federation members. This has required new social technologies. This precedent primarily uses the increased availability of loan finance to encourage the take up of sanitation. The local authority has provided land for eco-sanitation blocks in market areas, but has not otherwise contributed to the investments.

6.1 Rehabilitated communal toilet: Gadzema, Chinhoyi

Gadzema is one of the first high-density (low-income) settlements in Chinhoyi. The settlement was established in 1960 and some of the first dwellings to be constructed were allocated to married council employees. Dwellings constructed in subsequent phases were allocated to the employees of other government agencies. The original residents have since been replaced by new inhabitants. An estimated 700 households (2,500 people) are now living in Gadzema. Living conditions are poor and most of the dwellings have dysfunctional toilets. The toilets should be maintained by the council, but due to resource capacity challenges across all sectors of the economy, Chinhoyi Council has been unable to develop and maintain toilets in the region.

The precedent is a communal flush toilet that will be wholly managed by the community. The communal sanitation project is in an area known as ‘Gadzema Single Quarters’ where 60 families live in 15 four-roomed units. These families either lease the unit from the council or are sub-letting rooms from the council leaseholders. Council leaseholders have valid lease documents and receive a monthly bill from the council, which very few pay. Those tenants who sub-let pay rent of about US$ 35-40 to the council leaseholders. The sub-letting of rooms has allowed a parallel structure of rent collection to evolve that has caused the revenue flow to local authorities to dwindle. Their commitment to provide services has, in turn, waned. The original toilet block (which is near the bus terminal) is usually closed by local authorities despite the large number of commuters.
Figure 5: Toilet block Gadzema

Federation profiling and enumeration surveys highlighted the dysfunctional and unhealthy state of the existing toilet blocks in Gadzema. Human excreta overflowed in the passages of both women’s and men’s toilets clogging the sewers and making the toilet unsafe to use. At times the sewerage escaped the toilet block and flowed into nearby pathways and homes causing a serious health threat. Haphazard efforts were made by residents and the council to maintain and unblock the system with little effect. The flush toilets were affected by water cuts and it was sometimes difficult to control use during water cuts, resulting in a worsening of conditions. The community were using the toilets grudgingly as they compare themselves to some of their neighbours who had individual connections. The community felt that authorities should clean and maintain the toilets in return for rates payments, while authorities argued that the lack of rates payment by the community meant that they could not provide infrastructure and maintenance services. These perceptions created a blame cycle in which neither party took responsibility for maintenance.
Improving relationships

It was immediately evident to the Zimbabwe Alliance that three sets of relationships needed to improve for the precedent to take place. There needed to be collaboration between residents, residents and the local council needed to work together, and lease-holders and tenants had to resolve their differences. Issues around finance were critical at each level.

The Zimbabwe Alliance recognised that issues of affordability are a challenge to negotiate especially with those who have very limited resources. The settlement is dominated by people who do not have a steady reliable income as most work in the informal sector. The alliance team worked for more than six months to convince the community of the advantages of the communal toilets and explain the technical limitations in making individual connections to the rooms (their preferred option).

Initially, the Gadzema community was fraught with political divisions and even calling a general meeting was impossible. Community-led data collection demonstrated that the small community was politically fragmented. However, the survey process led to the formation of a Toilet Committee. The Committee had the tasks of supervising the construction and maintenance of the toilet, and mobilising the general community to support the project. The Committee, which continues to the present, is comprised of eight community representatives: three men and five women. The federation’s leadership in Chinhoyi initially supported the Committee to build skills and capabilities. The support was provided throughout the toilet design and procurement stages (three months) and then the Committee was supported to finish the construction and organise the management of the toilet.
The local authority also took a long time to come on board as they perceived this project as a federation project and thought that their support was strictly technical. Federation members used profile and enumeration data to mobilise both community members and local authority staff. In addition to the neighbourhood-based Toilet Committee, the alliance established a Project Steering Team to encourage residents and the council to take responsibility for the precedent. This team was composed of representatives from the local council, federation and Chinhoyi community and Dialogue on Shelter. From the council side, the project was anchored by the Housing, Health, Engineering and Planning Department and it was common practice for departmental heads to attend the meeting. Project Steering Team meetings were held twice every month during the first three months of the project and monthly thereafter. Further sanitation meetings were held with the local community and council. Over the course of the city-wide project it is estimated that there were 15 Project Steering Team meetings and 20 council and community meetings. To build the capacities of the local community, national and/or regional federation leadership as well as members of the Chinhoyi federation’s health, technical, savings and mobilisation components would also attend. Community data was shared with the authorities and feedback meetings were held. Gradually both sides came to see sanitation as a common challenge that could be addressed collectively.

The task of convincing both authorities and the community that a community-managed toilet can function under the right model of ownership and management required intensive "unlearning" of preconceptions - especially given previous experiences with public (government) toilets in Zimbabwe. The federation leaders supported the Gadzema community to be able to articulate, and appreciate, their potential role in the maintenance of community-managed facilities. As a result of this work, the alliance and community negotiated the following inputs from the council:

- Technical support in approving architectural designs
- Calculation of toilet block bill of quantities
- Provision of transport for the building materials, and some materials themselves
- Plumbers for the plumbing of toilets.

A further complication related to finance was the tenure status of households. Some families in Gadzema pay rent to absentee landlords. Gadzema residents wanted the council to transfer title to existing tenants. The council was reluctant to expedite the process and tensions flared, causing sanitation negotiations to break down between October 2013 and May 2014. The impasse was overcome by using profile and enumeration data to develop an action plan with the council that directly responded to the tenure challenge. The council agreed to identify alternative land to enable the de-densification of the site as a long-term solution. In the interim, all agreed to improve sanitation conditions at the current site.
Once this issue was resolved, the community was able to move on. However, it was difficult to locate some leaseholders and thereby convince them to invest in sanitation. Tenants described their stay as transitory and were not strongly motivated to invest in sanitation. The enumeration survey revealed that 33% of households were sub-letting rooms from council leaseholders, and the community devised a number of measures to persuade every household to participate. The Toilet Committee set up a register to record individual participation and financial obligations. The federation encouraged the residents to organise themselves in the 15 dwelling units with the families in each unit reaching agreement between the council leaseholder and their renters. As the project progressed, 95% of absentee landlords cooperated directly, while 5% allowed their tenants to negotiate on their behalf.

After construction was completed, all 60 households met and designed a management model. This is somewhat different to traditional approaches that agree on how the toilet will be managed before construction. The toilet block is somewhat abstract to the community until it is constructed, and the community need to develop and operate a responsive local system that is embedded in the community and led by women.

Each toilet is shared by seven or eight families with a roster for cleaning and maintenance. Each family has its own set of keys and is able to hold others in their group to account if they feel that the toilet is not being properly looked after. As piped water is not always available, each family stores water at home to use when using the toilet. Floor polish, freshener, toilet paper and any minor repairs are financed collectively from the money collected for maintenance. The toilet has now been in operation for six months and no significant problems have been reported.

6.1.1 Costs of the toilet block

Rebuilding the block cost US$ 16,500. There are now eight bathrooms and eight toilet cubicles. The local authority contributed US$ 7,500 (transport, building materials, river sand and plumbing). The remaining cost of US$ 9,000 was divided between the 60 households benefiting from the facilities. The federation provided a loan to each of the 60 households who will use the toilets (US$ 150 per family). Monthly repayments of US$ 6.25 are added to council rates for the next two years. Costs were relatively high due to a high specification required by the council.

The project has sought to avoid significant increases to the lease payments due to sanitation improvement, hence the prolonged negotiations with the council to avoid having the monthly charge increased. The council has also agreed to put 100% of the repayments into a municipal sanitation fund. At the time of writing the alliance was in the process of reducing the monthly sum of US$ 27, and continues to be in discussion around the monthly repayment rate of US$ 6.25. Repayments have been made to the council but the alliance has yet to agree on the percentage they will pay into the sanitation fund.
The Toilet Committee recognised that the street lighting was no longer working properly. The community installed lighting inside the toilets and put additional security lighting at the toilet block. The density of the settlement helps to ensure that it is safe to use the toilet during the evening as the houses are close to each other and the compounds are also very small.

6.1.2 Affordability

As noted above, affordability is related to a number of factors. In the case of this precedent, there are emerging lessons related to assets, cost of intervention, ability to spread costs related to the availability of loan finance and incomes. There are also lessons related to the replication of these efforts and the relevance of this model to addressing sanitation needs in Chinhoyi.

The toilet block is located on council land. The community is contributing to the cost, but it does not own the assets. This proved problematic. The project highlights the significance but also the intractability of the trans-sectoral challenge that is tenure security. Activities were initially delayed due to tenants’ frustration at having to pay rent to the leaseholder and their desire to be council tenants. This tension is not entirely resolved. The Toilet Committee continues to find some tenants difficult as they want to refer all issues needing attention to their landlords (the council leaseholders) rather than be active participants in their neighbourhood organisations. However, the committee supported by the federation continues its efforts to persuade all current residents to be involved.

The cost of the intervention per household is relatively low in terms of the set of precedents supported by the city-wide project, at US$ 150 per household. This is related both to the cost efficiencies in collective provision and the contribution of the council, which covered 45% of the capital costs. There was limited opportunity to reduce costs in the design of the block in part due to a reluctance to challenge council design preferences. Priority was given to relationship building.

Data was collected in 2013 to assess incomes; 60 people were interviewed, one for each of the rooms in which a family was living. Just over two-thirds said that they were economically active, mostly in the informal sector. While the households were keen to have improved services, they struggle to pay rates and service charges to the council and the average debt related to non-payment of such charges was US$ 289.

A further indication of low incomes is that 44% of those interviewed explained that children were not going to school because they could not afford the fees. Average household income including remittances from abroad was US$ 147. While there are always difficulties in securing income data, this estimate appears accurate to Dialogue on Shelter staff.

Affordability was improved when residents accessed the federation loan fund for their capital contribution. They are repaying the loan over two years with an interest rate of 1% and monthly repayments of US$ 6.25. This is advantageous to the network as they do not need to
worry about collecting the repayments; the council are responsible for collection. No deposit was required because of difficulties of organisation and a weak savings network. However, while the toilets appear affordable, the alliance is aware that some households face financial difficulties and the funds injected might take longer to revolve thereby limiting scope for replicability and scale. The original design of the toilet block had one cubicle reserved for a pay toilet and the Toilet Committee is yet to make this functional. This might have provided additional finance to assist with repayments.

Table 14: Cost and affordability of communal toilet block, Gadzema

The council makes a standard monthly charge for rates and services of US$ 27. Of this, US$ 11 is for water and sewer services. However, the bill has to be fully paid for the services to be provided. The alliance is working to embed the additional costs into monthly bills in a manner that is not over-burdening. Community members have been paying, but the council has been slow in agreeing how much money will be transferred into the sanitation fund that is in the process of being established.

<table>
<thead>
<tr>
<th>Total users house-hold</th>
<th>Average monthly incomes (household)</th>
<th>Capital investment</th>
<th>Capital loan repayment</th>
<th>Capital loan repayment as % of monthly income</th>
<th>Operational costs (monthly)</th>
<th>Investment/resources from the state or other actors</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>US$ 147</td>
<td>US$ 16,500</td>
<td>Loan repayment per household of US$ 6.25 with 24 months repayment period</td>
<td>6%</td>
<td>Need to pay water bill</td>
<td>US$ 7,500</td>
</tr>
</tbody>
</table>
Upgraded toilet block Gadzema, Dialogue on Shelter Trust 2015
6.1.3 Financial assessment and going to scale

As a means of recycling the finance, the project opened up the space for discussions with the council around a sanitation revolving fund in Chinhoyi that can be used to rehabilitate other communal facilities. The fund is seeded from repayments of the US$ 9,000. The federation’s successful work in Gadzema is being replicated through the construction of a school toilet at the Ruvimbo Primary School financed by a loan from the federation’s national urban poor fund. The toilet has been completed and the Chinhoyi sanitation fund is in the process of being established. The alliance has been recording repayments and is continuing to work with the council to finalise the terms of the sanitation fund. Gadzema is considered by the Zimbabwe Alliance to be a learning ground for this city-wide fund and exchanges with the city of Harare have already been planned; Harare is the other city in Zimbabwe with a fund. In terms of broader issues, the precedent is being used to reflect on the cost and management of communal facilities with the federation and its partnerships with local authorities. The project demonstrates the potential of community-managed sanitation blocks for residential neighbourhoods.
6.2 Simplified sewerage system: Vingunguti, Dar es Salaam, Tanzania

Vingunguti settlement in Dar es Salaam, Tanzania is home to approximately 107,000 residents. Despite living in close vicinity to the council’s waste disposal ponds, which service the formal city, residents face extremely poor sanitary conditions that are exacerbated during the rainy season with outbreaks of diseases such as cholera. A study of 1,000 compounds in 2015 found that 81.6% of latrines are located in compounds, 18.1% of latrines are public toilets and 0.3% are institutional toilets. Of the latrines, 38.5% are used by one household; 17% are shared by two households; 13.6% by three households; 10.3% by four households; 7.6% by five households; and 13.0% by more than five households. Of those sharing, 94.5% of respondents share latrines with households living in the same structure and around 5.5% share latrine with households living in the same structure as well as with neighbours from other compounds. Most interviewees were house owners (63%) and relatives of the house owners (20.6%). Some tenants were interviewed as representatives of their landlords, if their landlords were away.

Residents incur ongoing costs for sanitation. Generally cleaning is shared. In some cases, users make monthly contributions for taking care of the latrines. Some landlords charge tenants a fee (TZS 3,000) to maintain a clean toilet. The emptying of latrines may also be required although 48% of respondents reported that they did not pay anything for pit emptying - see section 5.1. Generally, the landowner pays the pit-emptying costs, especially when they are also living on site.

In 2014 the Tanzanian Alliance began piloting a simplified sewerage system in the settlement. The alliance first discussed adopting a simplified sewer system in 2013 during a studio with Ardhi University students. This studio was undertaken as part of a partnership between the Association of African Planning Schools and SDI. Vingunguti is adjacent to the utility’s waste stabilisation ponds and is hence well located for this precedent, which involved both improved toilets and the installation of sewer pipes from households to the ponds. The work was completed in two phases and in total 42 compounds with 91 households were connected to the network. Stakeholders involved include Ilala Municipal Council, DAWASA and DAWASCO, who provided technical support.

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13 Residents of 1,000 compounds in the settlement were interviewed as part of a simplified sewer feasibility study undertaken by the Tanzanian Alliance.
Box 3: Simplified sewerage explained

Simplified sewerage is an off-site sanitation technology that removes the waste from the immediate household environment. Conceptually it is similar to conventional sewerage, but with cost savings that are achieved through changes to the design. The simplified sewerage approach is now widely used throughout some Latin American and Asian countries although it has not been much used in urban Africa. Simplified sewers are laid at shallow depths. Smaller diameter pipes are used that are less expensive to purchase. The shallow depth allows small access chambers to be used rather than large expensive manholes. This increases ease of construction, allowing local residents to help and hence further reducing the costs. Sewers are laid away from the road (sometimes through backyards) so they do not need to be able to cope with heavy traffic. Typically house owners are responsible for the maintenance and operation of their connection pipe and connection box while the maintenance and operation of the ex-block system is handled by the local community or the sewerage authority.

Figure 6: Simplified sewerage coverage Vingunguti
The experience from the first two phases is that the compound (i.e. land owner and tenants) provides a good unit of social organisation around which to meet the collective challenge of sanitation provision. Residents in the compound (even if they are not federation members) have been able to mobilise around sanitation and take decisions on the design, maintenance and management of the facility. The alliance recognises the need to build better relationships with local government.

To further develop community capacity, a team from the Orangi Pilot Project (OPP) in Pakistan visited Vingunguti in November 2015 following the implementation of phases one and two. This was part of an SDI exchange to assist the Tanzanian Alliance with technical and social advice about how to reduce costs, improve affordability and scale up the project.

6.2.1 Financial costs of the precedent

The total cost of phase one, which assisted 20 compounds (i.e. 20 toilets), was US$ 8,219. Of this, just 31% was incurred to lay the sewer network and the remaining costs were incurred improving or replacing toilets. The toilet improvement cost was US$ 250 and the toilet replacement cost was US$ 370. The total cost of phase two, which assisted 22 compounds, was US$ 10,021 of which 29% was incurred through the sewer network. Costs of improved toilets were identical; the cost of new toilets fell to US$ 346.

In addition to the costs of the sewer network, toilet improvements and ongoing maintenance, DAWASCO charges a fee to deposit the wastewater in the sewerage ponds. A monthly payment of TZS 2500 (US$ 1.3) per toilet was agreed for the pilot project only. The cost currently charged for households connected to conventional sewerage networks (in planned settlements) is at least TZS 13,000 (US$ 6).

In this precedent, 200 people were connected during phase one and 250 people were connected under phase two. Some households along the sewer line did not connect to the sewer for varying reasons. Additional participation would increase the number of connections and reduce the costs faced by each household. Part of the capital investment in phase one was supported by a development assistance grant.

The exchange with OPP provided an opportunity to explore how the simplified sewerage system in Orangi was financed. In Orangi, the lane sanitation is financed by local residents. Once a lane decides to participate, monies are gathered by a local lane organisation. This serves to foster community ownership. Construction does not begin until the community has saved all the necessary funds and those who refused to pay have their portion covered but then are charged double when they wish to connect to the system. Very low-income households have their costs covered by other households. The costs of the secondary and main drains and the waste treatment plants are covered by the government but it took time to persuade government agencies to participate and initially the lane sewers deposited waste in natural streams that run through Orangi.
6.2.2 Affordability

Incomes in Vingunguti are reported in section 5.1.3. In summary, 35% earn US$ 50 a month or less; 24% earn between US$ 50 and US$ 100 a month; 21% earn US$ 100-150 and the remaining 20% earn more than US$ 150. The alliance is cautious about this data due to known hesitation about reporting incomes. However, its experience suggests that households in such settlements can afford to repay US$ 5 to 10 a month. Sources of income are varied. In summary, of the 1,000 people interviewed, 50% are self-employed (predominantly trading in food, fish, clothes, traditional medicine, vegetables and other such goods), just over 40% are not employed but are households, retired or without work. Of the remaining 7.5%, 2.7% are casual day workers, 3.3% work for government and 1.5% work in the formal private sector. Some households may be working in activities such as growing vegetables and hair plaiting (but these were not reported).

Rebuilding dilapidated latrines to connect to the system has added additional costs. However, the capital cost for improving the toilet has been covered by landowners alone. The monthly operational cost is shared by landlords and tenants. Further negotiations between landlords and tenants are needed to ensure that rents are not then increased to unaffordable levels leading to evictions. Issues of absentee landlords and those who do not wish to participate also need to be considered.

Experience to date suggests that there are affordability challenges when the capacity of landowners to cover the costs is considered. The experience of the first two phases suggests that it is proving difficult for households to cover the toilet, sewer and tariff costs.

Extensive discussion has taken place around financing the simplified sewer, and specifically the role of subsidies. The capital investment made in the first phase of the project was partially funded using a grant; second and subsequent phases will be funded in a way that enables the scaling up of this initiative. OPP staff explained that, in their experience, the use of capital subsidies prevents scaling up by raising expectations in other households that they too will receive a grant if they want to access the sewers. The Tanzanian Alliance has since implemented a repayment scheme for those who benefited from phase one. It is in the process of exploring how community contributions could be used to fund the scaling up of simplified sewers; it is also seeking to reduce costs.

6.2.3 Scaling up

Based on this experience and additional research, the Tanzanian Alliance has conducted a feasibility study for the expansion of the simplified sewer network to cover 1,000 more toilets in Vingunguti (within compounds or plots). It has also identified three further ponds that might be suitable for simplified sewers in the adjacent settlements.

Costs are in part related to the intensity of participation. The alliance is considering how to mobilise houses lane-by-lane along the proposed sewerage line (the more houses that connect, the lower
the capital costs for each household). A first step is to encourage them to save collectively for the system. The Tanzanian Alliance has the scope to build on the community savings model, which OPP did not use, to galvanise community structures around and beyond the simplified sewer. Raising monies is a first step to the scaling up of this work. Technical capacities will then be needed to enable households to participate in installing the sewers.

Based on the learning from the exchange with OPP and the findings from the feasibility study, the Tanzanian Alliance is planning to roll out the system lane by lane. The exchange visit with OPP has provided an opportunity for the community to reflect on how saving could support the expansion of the project. Working lane by lane allows the federation to scale up the project incrementally, building experience and capacity. OPP emphasised that the first lane is the most difficult. The federation leadership believe, following discussion with OPP, that the approach can work and there is simply a need to mobilise.

During the exchange with OPP it was noted that the system would remain expensive if, for each connection, the existing latrine has to be rebuilt. In the first two phases, toilet improvement and rebuilding costs were financed through the landowners accessing an existing programme of federation sanitation loans (within the federation’s ‘Jenga Fund’). As shown above and below, these costs add considerably to the cost of the precedent. OPP staff made technical suggestions on how it would be possible to repair and rehabilitate, rather than rebuild, existing latrines so they can be connected to the system. Ideas include concrete rings to re-enforce collapsing pits and focusing on fixing the slab only and not financing an elaborate and expensive superstructure. Once repaired, households can upgrade incrementally as finance is available.

The feasibility study has assessed the costs of scaling up the simplified sewerage network. It has calculated that the total capital costs for sewer pipe lines and manholes for the simplified sewerage is US$ 23,123. All 1,000 toilets in the area in which the expansion is planned were assessed to determine their suitability for the new simplified sewerage scheme. Findings show that 450 existing toilets are in very poor condition and may need to be rebuilt. The remaining toilets do not need to be reconstructed but do need to be improved. The costs for constructing new toilets and adapting old toilets total US$ 240,122. The alliance anticipates that the community will either fund these costs themselves or take a loan from the Jenga Fund. Additional expenses of US$ 14,200 will be required for mobilisation and organisation of the communities; capacity building of the community management committees including training; and holding partnerships and collaborative meetings between utilities (DAWASA/DAWASCO), NGOs and the community federation.

As a part of the feasibility study, households were asked about their willingness to pay for sanitation improvement; 28.5% are willing to pay not more than US$ 50 for toilet improvement and sewer connection, and the remaining majority are willing to pay between US$ 50-200 for the same. The majority are willing to pay between US$ 1.25-3.75 as monthly user charges for the service.
Investment in public infrastructure at the city level has tended to be in sewers to individual plots. The Tanzanian Alliance is keen to engage with government around the possibility of investing in communal infrastructure like simplified sewers, and secured a verbal agreement with local authorities to expand the Vingunguti system to that effect. Linked to this, the alliance recognised the need to establish a local sanitation financing mechanism to support the work of low-income communities. Ward and municipal sanitation action plans already exist, but there is little finance. The Tanzanian Alliance is keen to establish a ward/municipal sanitation fund so that government and other key stakeholders contribute resources for community-led sanitation improvements. For the project to achieve scale, DAWASCO along with the Municipal and central government will have to support the project through allocation of sanitation funds for the necessary public infrastructure. The alliance is keen to negotiate with DAWASCO to reduce the charge made for using the wastewater treatment ponds. The utility company is broadly supportive. It recognises the potential for the simplified sewer to connect to at least some of its network. Utility staff have been involved in the pilot and are willing to accept this technology. The alliance recognises that the Ilala Federation needs to work more closely with both DAWASA and DAWASCO. The alliance itself needs to engage with the Energy and Water Utilities Regulatory Authority, which is responsible for the tariff setting, and ensure that the tariff charges for the low-income communities are affordable.

In terms of sources of potential government finance, DAWASCO has been mandated to put aside a percentage of its water revenue into a Social Connection Fund to subsidise first-time household connections, which are essentially low-income households. This Fund should also construct, manage and maintain standpipes and water kiosks. Local government through their own budgets do normally plan and implement water and sanitation projects in peri-urban areas in addition to DAWASA/DAWASCO operations.

The simplified sewerage scheme implemented at Vingunguti provides an entry point for further negotiations and agreements with authorities. The federation has conducted profiles of another nine ponds to explore their suitability for simplified sewer connections. Of these, three ponds (Bugurini, Mabibo, and Kitunda) have been identified as suitable.

Staff at the Ilala Municipality have initiated a Municipal Forum that has started to address other issues such as solid waste management. Following discussions, the Ilala Municipality agreed to take this project and present it to the committee responsible for sanitation to see how they can support the project including by adjusting bye-laws and regulations as required. The Korean government has shown interest in supporting Tanzania to increase the size of the present sewerage system from the current 10% of the population to 30% of the population; there is a potential that it might assist.
Table 15: Cost and affordability of simplified sewer in Dar es Salaam

<table>
<thead>
<tr>
<th>Total users (households)</th>
<th>Monthly incomes (household)</th>
<th>Capital investment</th>
<th>Capital loan repayment as % of monthly income</th>
<th>Operational costs (monthly)</th>
<th>Investment/ resources from the state or other actors</th>
</tr>
</thead>
<tbody>
<tr>
<td>91 households</td>
<td>50% of people have monthly income of not more than US$ 50</td>
<td>US$ 18,240</td>
<td>Repayment period will be 1-3 years depending on loan amount Minimum monthly repayment is US$ 4.6 and maximum monthly loan is US$ 13</td>
<td>US$ 2 a month divided by the number of households</td>
<td>Contribution of a man hole by DAWASCO worth US$ 2,000.</td>
</tr>
</tbody>
</table>

The team tracing possible future sewerage lane (Noah Schermbrucker 2015)
6.3 Blantyre: public eco-san toilets

The sanitation challenges that Blantyre currently faces are complex with limited affordable options for informal residents to choose from. Without sewerage treatment or disposal services, and with poor access to water and a lack of space, there are limited options. The Centre for Community Organisation and Development (CCODE) and the Malawian federation have been supporting informal communities to access eco-san toilets since 2005. By 2015, approximately 800 toilets serving 14,400 people had been built. Eco-san toilets were first introduced in a Greenfield housing project in Lilongwe but, over time, provision has become a stand-alone investment in informal settlement upgrading. Once the first toilets were constructed, the benefits were realised by many and demand among federation members grew. In part as a consequence of the popularity of eco-san, sanitation has emerged as a key aspect of the Blantyre Alliance’s settlement upgrading efforts and since 2010 the alliance has made sanitation loans available.

Household eco-san technology offers a way of safely disposing of faecal sludge. Traditional pit latrines and ventilated improved pit latrines require sludge to be disposed of through pumping (unless the toilet is closed), which is difficult in informal settlements as the road network is very poor. Narrow roads mean that it is almost impossible for the pit latrines emptying tracks to enter the settlement. Most of the households share a latrine that does not even take long to get filled up, forcing them to start looking for another space to dig. Eco-san toilets are designed to process waste and, with the addition of soil and wood ash, the sludge gets treated over time and turns into a compost soil that is easily handled.

SDI affiliates in southern Africa have been investing in a model known as ‘sky-loos’ in which the toilet is raised to facilitate access to the dried faeces and reduce risk from flooding. Many informal residents
use water from shallow wells and boreholes and since eco-san toilets are raised, unlike traditional latrines, they cause hardly any groundwater infiltration or pollution and are considered to be safer, more environmentally-friendly options. This model first emerged in Malawi and has since spread to Zambia and Zimbabwe. Sky-loos have proven to be able to withstand disasters as demonstrated during the heavy rains and floods that hit Blantyre in January 2015. Many pit latrines collapsed or were filled with water; however, only a single eco-san toilet was reported to have suffered damage. This incident has further improved the reputation and increased the demand for eco-san sanitation in the affected areas. Eco-san toilets only require a small amount of water for use and maintenance and are therefore sought after in areas with inadequate water supplies due to low pressure (which is the case in most of Blantyre). The toilets built to date have been spread across low-income areas in Blantyre with greater uptake in areas with rocky ground where traditional latrines have been difficult and expensive to build. The federation argues that while traditional latrines cost about half the price of an eco-san toilet, they may need to be emptied frequently or rebuilt after two to three years.

As the federation supports informal settlement upgrading, this technology is a tool through which households can upgrade their own sanitation. In Malawi, eco-san toilets are constructed by federation and non-federation members. This has also prompted the Malawi federation to rethink its basis for membership as it seems to have evolved naturally from a savings groups to a wider community base. Finance (through loans) is now made available to non-federation members as well. This change was motivated by the interest in the technology from the wider community and recognition that scaling up must imply working beyond federation and members facing sanitation challenges as a whole community. For example, the cholera outbreak of January 2015 affected entire communities.

Six eco-san public toilets have been constructed in market places in informal settlements. It is hoped that these will help to address the lack of sanitation facilities in those areas, and serve about 1,500 people who work and visit each market daily. Experiences in Zimbabwe suggest that this is a difficult design for people to use without education and monitoring to ensure the separation of urine and faeces, and the use of ash to maintain the necessary dryness for the composting process and to reduce the smell. However, with caretakers these toilets have been working effectively. With assistance from federation leaders, the community traditional leaders and market executive committee have been supporting the management of the toilets.

6.3.1 Financing

Providing sanitation loans is essential to the affordability of this precedent. At first, toilet loans and technical support were only offered to federation members and such loans were accessed and managed through savings schemes. However, after a number of years, and following internal discussions, sanitation loans were made available to non-federation members. Most households finance their toilets through loans.
The current cost of a complete eco-san toilet (toilet and bathroom) is US$ 272 (MK 150,000) plus building materials that residents must provide. The Zimbabwean federation has reduced the cost of eco-sanitation to US$ 250 per unit (suitable for being shared with up to three households). It has experimented with models as low as US$ 100 but has concluded that these are not hygienic as they are not raised high enough to prevent flooding in the rainy season. The Malawians do not believe that the cost of the toilet can be further reduced.

Families are required to make an initial payment of 10% and pay the rest over a one-year period (with interest that is now set at 4% a month). The rate was previously 2% a month with a repayment period of two years; this was changed in 2014.

The process of including non-federation members required a focus on the mobilisation of entire communities. In Blantyre, eco-san toilet provision has taken a central place in slum upgrading strategies. The slum upgrading work is undertaken in close collaboration with traditional leaders, who play an important role in vouching for individuals to receive sanitation loans, managing various meetings and overseeing any issues that arise around repayment.

In 10 settlements where the household eco-san toilets and the public toilets are being constructed, chiefs and ward councillors are playing a leading role in their mobilisation. The land was provided by the local authority in one instance, and by local leader in all other five cases.

Drawing traditional leaders into the process has proved effective especially when working with non-federation members. Loan repayments rates have varied between 45% and 87% over time and are often affected by variables such as whether it is a lean period or harvest time. Shifts in the methods deployed by the federation have also affected repayments (e.g. a 5% commission for loan collectors has recently been introduced.) However, repayments may be problematic, raising questions about the effectiveness of this financing strategy. The loan applications are done primarily through groups at community level. This encourages connections within the community and promotes learning in terms of use and management.

6.3.2 Affordability

Loans help people afford a sum that they could not otherwise afford; however, it is felt that the loan amount is still too high. Costs can be unaffordable for many of the lowest-income residents of informal settlements in Blantyre. As reported above, the 2012 study of 4,255 residents in Blantyre suggests that 38.5% of households have an income below MK 8,000 (US$ 29); another 5% have an income between US$ 29 and 58; and 39% of households have an income above US$ 58. 18% of households did not report their income. These findings are somewhat lower than Kadewa’s (2014) conclusion that informal settlement incomes in Malawi in 2014 were between MK 20,000 and MK 100,000 (then worth US$ 33–165) (referenced in Hunga 2015). Hunga (2015:20) estimates incomes in low-income (informal) areas in 2015 averaged US$ 84 with an eco-san loan requiring an investment three times that amount.
In many cases, eco-san toilets are provided for individual plots on which both land owners and tenants are living. The burden has been on land-owners to invest in the toilet, with tenants having to put pressure on their landlords so they agree to pay for the construction costs of the facility. Affordability is increased through the requirement that households provide some of their own building materials. The federation has agreed that people source local materials (such as sand, bricks and quarry stones) and provide part of the labour required. The loan therefore covers the costs of cement, iron sheets, PVC pipes, timber, wooden doorframes and doors, nails, and payment for the specially trained eco-san mason. Those taking loans are organised in groups of between five and ten people; this reduces the costs involved in transporting the building materials that might add as much as 30% onto the costs.

Despite these efforts, the experience of the federation and CCODE was that households struggled to raise the 10% deposit. At times, more flexible approaches have been tried with lower deposits. However, the difficulty is that payments do not even cover the costs of interest and hence households see their debt mounting and begin to believe that it is not possible to ever repay the costs involved.

In the cases when landlords have invested, in general, rents have not increased because in Malawi it is the landlord’s responsibility to provide a toilet for tenants - a cost incurred whether the investment is eco-san or a traditional pit latrine. Most of the toilets have been constructed by house owners. In the cases of tenancies, there have been one-to-one agreements with the landlords - but this has been the minority of cases. Generally, there is increase in rents commensurate with improved sanitation. One way this can be avoided is by having good landlord-tenant relationships, which can be achieved by sensitising community members about the importance of having the improved toilet as a requirement of adequate housing.

The compost produced from the toilets can be used as a fertilizer for gardens and crops. However, this is dependent on a market for the product. In some cases, users have been able to sell the harvested manure to local farmers or companies and generate additional income for the family. A 50kg bag can be sold for up to US$ 4 (MK 2,500). In six months, a household produces a minimum of 300kg (six bags). Some users have sold compost to the city council to be used for landscaping initiatives across the city. However, it is hard to find buyers. Only 20% of eco-san households are using or selling the compost due to a lack of demand.

These community-managed toilets are financed through a fee paid by customers. The charge is US$ 0.07. While this may be relatively low for successful market traders it adds up to US$ 1.4 a day if a family of five each uses the toilet four times a day. This income aims to ensure their maintenance and care of the toilet block.
6.3.3 Scaling up

The provision of eco-san is implemented as a joint venture with Blantyre City Council, and has helped to deepen the relationship between the City and the Malawi Alliance. The city council provided support in terms of programme design, and in some cases it also provided land for public toilets. The local government has shown much interest in the precedent as seen in their city development strategy, and they recognise the work the federation is doing in helping curb the sanitation problem. Blantyre City Council has accommodated and allowed eco-san toilets, and as part of the SHARE work, a city-wide sanitation strategy is set to be developed. This has helped scaling up of efforts. Furthermore, eco-san toilets have been included in the national sanitation catalogue as an improved sanitation technology, an achievement that will enhance its replication. Government officials provide testimonies of federation work and letters of recommendations when applying for such projects from donor agencies. However, they have not provided finance.

While a lot has been achieved so far, the scale of the problem in Blantyre is huge and further efforts are needed to address improved sanitation for the poor. The construction of household eco-san toilets is an ongoing process, with a revolving fund financing mechanism that covers the loans provided over time, and a demand that continues to grow. However, the affordability problems may constrain the growth of this form of sanitation provision. The increase in interest rates and the reduction in the period of the loan have increased the costs and exacerbated problems of affordability. There are also questions about what can be done if the landowner refuses to invest.

A city-wide sanitation committee has been set up to oversee the functioning of all the public toilets and all local committees (to ensure appropriate management of the facilities). The city-wide committee is expected to engage in other initiatives related to city-wide sanitation in the near future. CCODE, the federation, the city council and traditional leaders are represented in the committee, ensuring close partnerships for better sanitation in the city. However, scaling up may be limited as the income secured from the public toilet blocks has been re-invested in neighbourhood projects rather than made available to support further sanitation investments in Blantyre through a city fund.

Using data from enumeration reports, the density of eco-san provision ranges from between two in ten households in some areas and six in ten households in others. This suggests that there is a considerable investment being made in the local area. One question is whether these resources might be used more efficiently if there was a stronger collective process and alternative technologies developed.
7. Conclusion

In the absence of financing for city-wide sanitation infrastructure such as sewers, communities often rely on a range of on-site and decentralised solutions, many of which have the scope to be scaled up beyond the household and community level if they were more affordable. While the affordability of these options is influenced by the cost of these solutions, it is also influenced by the incomes of households and the financing available from the government or other funders, and if involved, the cost of loan finance. Through the SHARE City-wide Sanitation project, SDI affiliates have documented many of the means by which communities have sought to identify sanitation needs and develop precedents in sanitation. Addressing the affordability challenge has been central to this process. Discussions within sub-Saharan SDI affiliates to establish very broad and indicative guidelines for affordability led to the figure of US$ 3–4 per household per month as a target for sanitation interventions if they were to be realisable by the majority of households in the settlement (Banana et al 2015:14). The case studies discussed in this paper demonstrate how in the absence of subsidies, many of these precedents were more expensive than this, and how SDI affiliates have sought to address the affordability challenge on several fronts, specifically:

- Enhancing collective capabilities and social capital to build participation and collective action responses to sanitation
- Building partnerships with government to co-produce sanitation provision, while recognising the limitations of relying on the state
- Using influence to leverage support and resources from the state albeit at the project level
- Developing accessible affordable finance, in light of the limitations of the market, particularly if all financial risks are shouldered by low-income households
- Introducing community cross-subsidies between landowners and tenants
- Putting value in incremental improvements

Inclusion and broad participation from all of those able to benefit from the improved provision is central to addressing the affordability challenge. In each instance, communities have built social capital and their collective capabilities by working together to identify their sanitation needs through mapping and enumerations. The work undertaken under the city-wide project has shown the potential of enumerations as a mobilisation and dispute resolution tool. Amid a politically fragmented community in dispute with local authorities this “objective” information has paved the way for a joint vision and collective action around sanitation needs. It has also provided an opportunity for discussion and the development of guidance around what is affordable.
Similarly, sanitation precedents have been developed by federations of the urban poor in each city in an attempt to reflect on local needs, including affordability. In practice, the precedents developed demonstrate that increased participation in the construction, management and use of faecal sludge management and/or the toilet technology has more scope to bring down the cost of sanitation. This has been demonstrated through the rehabilitation of the toilet blocks in Gadzema in Zimbabwe, where all community members manage and share use of the precedent. This has not been observed to the same extent through the simplified sewer technology in Vingunguti in Dar es Salaam where not all households have been connected, for diverse reasons, including the cost. However, some households have made this form of sanitation more affordable by sharing their toilet with up to five households. This is significant in Gadzema and Vingunguti. While all the possible beneficiaries agreed to take part in the case of Gadzema, this was not the case in Vingunguti. During the first phase, two compounds were left out, but during the second phase one of these compounds decided to join up to the system, although one further compound in the lane decided not to participate. It is clear that the choice to invest in communal residential facilities faces social, political and economic challenges, and the development of alternatives requires sustained community mobilisation.

In each city, federations of the urban poor have sought to engage with local authorities and sector stakeholders to develop more democratic planning and decision-making processes that include low-income urban groups. These processes of engagement present opportunities for communities to sensitise local authorities to sanitation provision that might be more affordable to the urban poor. The experience of the Indian Alliance around community-constructed and managed toilet blocks provides a clear example of how communities have sought to develop and gain support for a more affordable accessible sanitation solution at scale, as community toilet blocks were incorporated into the Indian National Sanitation Policy (Patel 2015). In Gadzema, the communities worked intensively with the local council to convince them that communities could manage and maintain community toilet blocks. The project then opened up space to use the recycled loan funds to set up a sanitation fund in the city to rehabilitate other toilet blocks.

As outlined in this paper, there is a serious financing deficit that underpins poor access to sanitation in low-income settlements. Consequently, the provision of government resources has the scope to bring down cost and achieve scale, and is thus very significant in determining the affordability of sanitation precedents. The toilet block constructed in Gadzema secured funding from the local authority, which covered 45% of the costs\textsuperscript{14}. Support and investments from utilities and municipalities are central to scaling up and bringing down the cost of sanitation. This potential is shown in Vingunguti, where local authorities and DAWASA have shown interest in developing and expanding simplified sewers to up to 1,000 households.

\textsuperscript{14} The costs are arguably still high in part because the block includes showers as well as toilets, and because relatively high specifications were used.
However, without that financial support, the Tanzanian federation will be unable to embark on this expansion using technology that is affordable to community members.

The provision of affordable and accessible finance for low-income households has the scope to drive improvements in sanitation. The Malawian Alliance recently changed the terms of the sanitation loans provided for eco-san toilets so that repayments are made over one year at 4% a month. The alliance has taken this approach in the absence of more affordable sanitation technologies and any substantial financing from the state. In the absence of any public investment, the Alliance has come to rely solely on market mechanisms, which place all the financial burden and risk on the shoulders of low-income households. Affordable and accessible finance has an important role to play in improving sanitation for the urban poor, but is unlikely to provide a solution to the sanitation needs of the urban poor at scale. An example is the extent to which the term for repayments has the scope to lessen or increase the burden and risk of defaulting. Assume a low-income household takes a loan of US$ 250 and repays this over one year at 4% a month; loan repayments of US$ 30 a month are required. If the same loan is spread over three years with an interest rate of 1% a month, then the required monthly repayments are US$ 8.75. This demonstrates the shortcomings of using market mechanisms and the negative consequences of such mechanisms for affordability. In the absence of an inclusive affordable sanitation product and/or state contributions, all the financing responsibilities are placed on the household.

Cross subsidies within the community play a role in making sanitation more affordable; as part of the SHARE City-wide project this has been achieved by opening up negotiations between landlords and tenants around investments required for sanitation upgrading, which do not lead to unaffordable increases in rent. This process is ongoing in Vingunguti. Land-owners have been willing to take on the cost of capital improvements and have agreed to not increase the cost of rent for the duration of the loan finance that they have received to undertake the upgrading. This is a form of informal community cross-subsidy, but in this instance it depends on trust and there will be a continuous need to monitor rents. At this stage it is not clear what the implications of such cross-subsidies will be. If enough toilets are improved and rents are primarily determined by incomes, then it may make little difference to the cost of accommodation. Equally if the communities are strong enough, they may be able to negotiate and resist attempts to increase the costs of accommodation. This is something that federations will continue to monitor as part of efforts to improve access to sanitation.

The use of incremental approaches to improve access to sanitation can tackle some of the affordability challenges facing low income households. The costs of “modernisation” are evident in the experiences in Vingunguti, as efforts sought to upgrade toilets and develop connections to simplified sewers. The first simplified sewer that was constructed sought to improve connections and toilets. This means that the relatively low cost of improving sewers is off-set by the significantly higher costs of improvements to toilets. The experiences...
of the OPP staff are relevant here; they recognise that low costs are very significant to scaling up any endeavour. They suggested moving forward by installing the sewers with minimal investments in toilets that are then improved through incremental efforts. The incremental improvement of toilets improves affordability in two ways; firstly, it is possible for households to defer the investments until they have additional funds; secondly, the interest costs are significantly lower if there are multiple small loans. It is important to note that improvements need to be carefully prepared if additional construction costs are not to be incurred. However, there is reluctance to adopt the incremental approach. Both the Tanzanian and Malawian Alliances appear to place significance on improving toilet facilities. Reports from Blantyre emphasise the quality of the toilets, and this concern is understandable. First households are ambivalent about the quality of their dwellings in a context in which there is a discourse of cleanliness, in which they are criticised for a lack of hygiene and where sanitation improvements are often directly associated with this. Second, the local authority officials and politicians are frequently reluctant to sanction incremental improvements preferring a “modern” construction that addresses their own perceptions about improvements. However, while understandable it reduces affordability and limits scale.

The work undertaken by SDI alliances under the SHARE City-wide project demonstrate that in the absence of sufficient investment, low-income households and communities can drive innovation around faecal sludge management and toilet technologies and be significant investors in sanitation upgrading. However, there is no single model that will meet the diverse needs of all unserved urban communities, and consequently SDI affiliates continue to work on developing a range of trajectories towards improved sanitation. These trajectories reflect the availability of resources and finance, local needs, and the relationships between low-income communities and institutions that govern sanitation provision at the local and national level. It is clear that to achieve the environmental and health benefits that come with improved sanitation at scale and to realise targets that aim to universalise access to sanitation under SDG 6, provision has to be affordable; local initiatives require some political and financial support from the state.

There is no single model that will meet the diverse needs of all unserved urban communities.

SDI affiliates continue to work on developing a range of trajectories towards improved sanitation.
Bibliography


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(Footnotes)

1 Users reported are in addition to households in other tables.

2 Dar: Number of households has been calculated by adding all households who received toilets and the number of users. This information was collected during identification of beneficiaries and also during routine monitoring and evaluation data collection. The numbers include both completed toilets and those still under construction.

3 Blantyre: One toilet shared by three households and six people in each household.

4 Kitwe: At the minimum two households with an average family size of six use the toilets. Both landlords and tenants use toilets.

5 Chinhoyi: Households are multiplied by five to calculate the number of people. Please see Table 11 for numbers serviced through communal toilets.
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