



Learning Paper

Financing Sanitation for Cities and Towns



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The views expressed in this report are those of the author and do not necessarily reflect the views of SNV Netherlands Development Organisation.

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Financing sanitation for cities and towns

Learning Paper

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Background and aims

SNV commissioned the Institute for Sustainable Futures, University of Technology Sydney, to co-create a user-friendly resource based on a desktop review of leading literature. The paper has been prepared for an audience of advisors, planners and people facilitating urban sanitation without easy access to financing, especially upfront capital.

The paper aims to bring together existing information in a form that is targeted to this audience, to clarify principles, show examples of ways others have financed sanitation and demonstrate what is possible.

The learning paper has used the OECD's *Innovative Financing Mechanisms for the Water Sector* (OECD, 2010) as a core reference, complemented by other resources (see reference list).

A short version of the draft learning paper was presented to a D-Group facilitated by SNV in October 2014, and opened up for online discussion. Insights from this D-Group discussion have been incorporated into this paper, with appropriate acknowledgement.

The complete list of contributors to the D-Group discussion is provided under the *Acknowledgements* section on page ii.

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1 INTRODUCTION

Sanitation is a basic human right set out in international human rights law, that makes it an obligation of States to respect, protect and fulfil this right¹. Sanitation is not only crucial for public health and environmental health, but also underpins economic development – while the lack of sanitation results in enormous economic costs to a nation (Hutton et al, 2007). National and local governments therefore have the responsibility to ensure that all their citizens have access to adequate sanitation, with no marginalisation or exclusion of any minority groups.

Planning and financing for sanitation in cities and towns in developing countries is often ad hoc and piecemeal. Stronger capacity to plan financing for sanitation infrastructure (and services) for the long term will lead to better outcomes.

Planning for adequate long-term services requires consideration of the complete sanitation service chain over the lifecycle of the associated service infrastructure.

The **sanitation service chain** is the complete sanitation system encompassing collection, treatment, storage, reuse/disposal of human excreta and wastewater. The key components of the sanitation service chain are illustrated in Figure 1 for the different scales of operation that could co-exist in cities and towns.

The **lifecycle** refers to the series of stages that sanitation service systems move through over time, from preparation, commencement, operation and maintenance, repair replacement and renewal (see Section 2.1), that require investment in hard infrastructure as well as supportive social and institutional arrangements to provide services that last.

The aim of this paper is to provide a starting point for such planning for the service chain and lifecycle to occur. It is a synthesis of key literature on financing for the water services sector seeking to achieve the millennium development goals (MDGs) and its post-2015 successor, the sustainable development goals (SDGs). The findings from the literature review are complemented by key insights from an online ‘DGroup’ discussion organised by SNV on the topic of ‘financing for urban sanitation investment’.

The focus of this paper is on access to the **upfront finance and other ‘lumpy’ finance needs**, for initial investment and for rehabilitation/replacement as physical systems approach their end of life. The upfront investment is the main determinant as to whether there is service at all, and the decisions made upfront have a profound influence on the performance of the entire service chain. This focus is not a denial of the utmost importance of the relatively smaller and ongoing funding required on a day-to-day and short-term basis, but rather, a recognition that their financing is qualitatively different. Regular sources of revenue might be more readily available for the smaller ongoing requirements, whereas the ‘lumpy’ investments require finance upfront (OECD 2010).

Some mechanisms for accessing capital are designed to leverage investment from users (for example, through sanitation loan schemes targeted at householders). These rely on payments/repayments from users, which may be prohibitive to the poorest of the poor. Planning for adequate financing for sanitation must include strategies that prevent marginalisation or exclusion of the poor. Various forms of pro-poor government subsidies and cross subsidies have

¹ UN Resolution 64/292, General Comment No. 15. See http://www.un.org/waterforlifedecade/human_right_to_water.shtml

a role to play (WSSCC, 2009; WSUP, 2012). A discussion of pro-poor subsidies, while important, is beyond the scope of this paper.

Structure of paper

Foundational concepts and principles for sanitation financing are introduced in Section 2, that include the financing elements of 'costs' and 'revenues', the principle that revenues must be adequate to recover lifecycle costs, and the concept of repayable finance.

Repayable finance is very important for providing access to upfront finance and other 'lumpy' finance needs, allowing a financing gap to be bridged. Section 3 introduces the main sources of repayable finance available, and their relevance for financing sanitation. Section 4 then discusses a number of innovative schemes for accessing repayable finance, illustrated by case studies.

The paper concludes with a summary of key insights from the literature and DGroup discussion as 'take home messages', and invites readers to try their hand at applying these to design an innovative financing scheme for their own context, using the template provided.

Scope

In this paper the focus is on monetary costs.

Ideally planners need to also consider environmental costs or impacts (and planning to limit impacts to within the environment's natural capacity to absorb wastes and regenerate), and also social impacts (which are even more complex to identify and agree about limiting). There was vigorous discussion of these other costs and impacts in the DGroup, including the shifting of costs to the environment through environmental pollution from inadequately treated wastewater, the inequitable distribution of costs and benefits between different groups of people (those served by centralised sanitation and onsite sanitation, and dwellers in large cities and small/medium towns), and the impacts of corruption and poor governance. While these are very important issues, it is beyond the scope of this paper to address them.

While planning for lifecycle costs is emphasised, the time value of money is not discussed for the sake of simplicity and clarity, in line with the approach of the core reference (OECD, 2010).

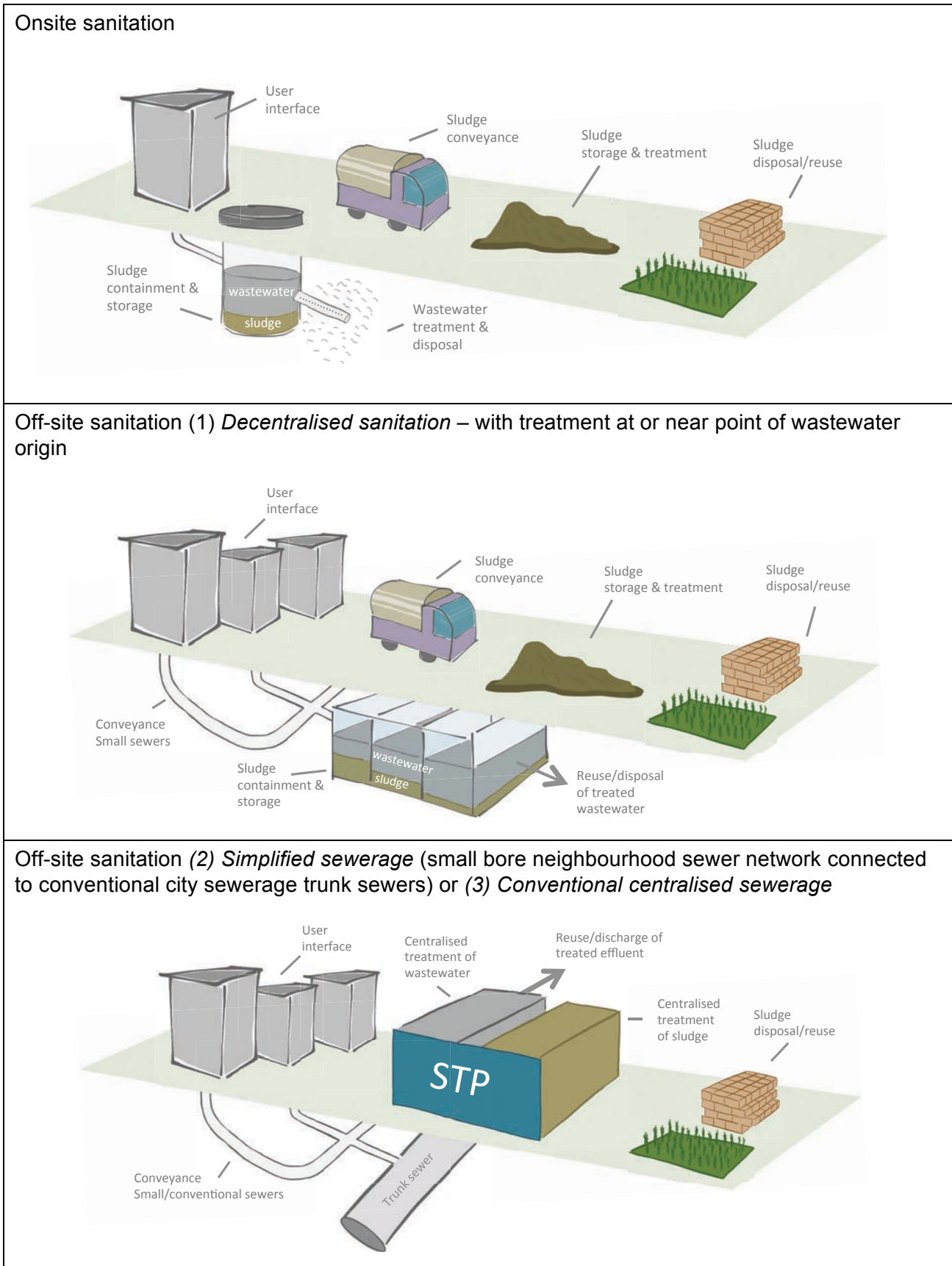


Figure 1: The sanitation service chain can be made up of several components, depending on the particular configuration. Onsite and off-site sanitation, decentralised and centralised sewerage are all likely to coexist in cities and towns.

Clarification on sanitation systems to be financed

The fundamental principles for sanitation financing are not specific to any particular technology. Irrespective of the particular technology, the full sanitation service chain needs to be considered: user interface, containment, storage, transport, wastewater treatment, sludge treatment, reuse/disposal of treated effluent and sludge, as denoted in Figure 1.

There was some discussion in the DGroup about the place of onsite sanitation systems (OSS) in planning urban sanitation. The prevalence of OSS in urban contexts requires that they be considered, but they need to be considered within the context of provision for the entire service chain. In the absence of a full service chain that safely manages **both** wastewater and faecal sludge, the role of OSS in high density urban contexts poses significant challenges. In the OSS context, faecal sludge management (FSM) is a critical activity that planners need to incorporate and secure financing for. But to ensure the full service chain, authorities need to take measures to ensure adequate treatment of the wastewater from OSS as well.

The focus on financing the larger 'lumpy' investment costs is relevant for 'public' services (that serve relatively large populations rather than single households), where those providing the services (private sector or government organisations) need to think about initial investment, day-to-day O&M, intermittent maintenance and asset renewal. The sanitation services that need to be financed may relate to one part of the chain (e.g. treatment works, FSM), or a whole decentralised system or centralised system, etc.

2 BASIC ELEMENTS OF FINANCING SANITATION

This section provides a review of fundamental principles and ideas that underpin planning finance for sanitation infrastructure projects.

2.1 UNDERSTANDING THE FINANCING REQUIREMENT (ANTICIPATED LIFECYCLE COSTS)

Planning for long lasting services requires identifying and estimating the costs of sanitation service systems over their lifetime, in order to understand what finances are needed and when. Researchers such as from IRC's WaSHCost program² have advanced the discussion on identifying the main lifecycle cost items.

For the purpose of this paper, we have grouped the main cost items according to *when they are incurred* in the sanitation lifecycle:

- Initial investment** – community engagement, project preparation, system design, site preparation and installation, commissioning etc. Also includes service extensions.
- Regular day-to-day operations** – operation and maintenance of hardware, administration and management, regular community engagement etc.
- Intermittent maintenance** – minor repairs and replacements (e.g. pumps), desludging, etc. required at relatively short time intervals.
- Major rehabilitation, replacement and asset renewal** – major activities required at relatively long time intervals, such as repairs and replacements of aging infrastructure elements.

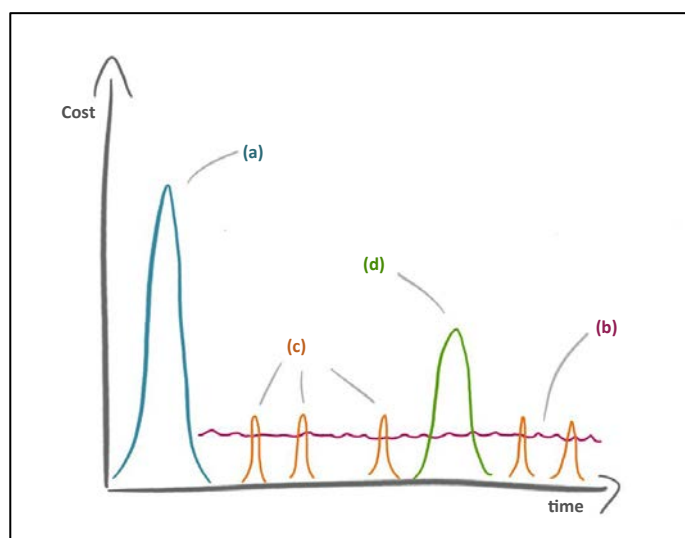


Figure 2: Lifecycle costs: costs incurred over the whole life of sanitation service provision (a) Initial investment (b) Day-to-day operations (c) Intermittent maintenance (d) Asset renewal

² <http://www.ircwash.org/washcost>

Other authors have grouped the costs differently. For example the WashCost program uses two groupings: ‘*capital expenditure*’ (includes *a* above) and ‘*recurrent expenditure*’ (includes all post-installation lifecycle costs). Tremolet (OECD 2011) uses three groupings: ‘*investment costs*’ (‘rehabilitation and new’, that is *a* and *d* above); ‘*operating costs*’ and ‘*maintenance costs*’.

Since focus of this paper is on upfront finance and other ‘lumpy’ finance, it is simplest to think in terms of two cost groupings:

- *Investment costs* (representing the **upfront and major lumpy costs** in the lifecycle: namely the initial investment costs and rehabilitation, replacement and asset renewal costs, *a* and *d* in Figure 1 above) and
- *Operation & maintenance costs* (all other costs incurred regularly on shorter timeframes).

There is scope for interpretation to suit the context – for example, in some situations desludging may be considered O&M, while in other situations it may be considered a major lumpy rehabilitation cost.

2.2 UNDERSTANDING THE FINANCING SOURCES (REVENUES)

Dominant ideas about where the financing for sanitation should come from has undergone many changes, strongly influenced by developments in industrialised countries (Abey Suriya, 2008). Three clear patterns of widely accepted thinking are evident:

(1) Funding mainly by taxes (late 1850s to 1970s):

Since the industrial revolution when European countries began investing in sewerage systems in cities, sanitation was regarded as a public service, funded predominantly **by government** (through taxes), with users contributing to services through local government taxes or municipal rates. This approach contributed to the rapid economic development seen in industrialised countries, but also led to low cost recovery and huge funding shortfalls in developing countries in particular.

The 3Ts

Tariffs - contributions made by service users in return of using the service

Taxes - costs paid for by government funds raised through the tax system

Transfers - contributions made by international donors (ODA or ‘overseas development aid’) and a range of other charitable entities through grants, low interest loans and underwriting projects through guarantees.

(2) Funding by tariffs (1980s onwards):

With the rise of market economic thinking and the need to recover costs, the dominant view became that the full cost of providing services should be paid for **by users**, through tariffs. The dominance of this thinking has led to this approach being called the “**full cost recovery**” paradigm – merging the *principle* that the full cost of services should be recovered, with the *mechanism* of using user charges to make that happen.

Although widely adopted as water services policy, full cost recovery through tariffs is difficult to achieve when lifecycle costs are considered. Some industrialised countries are coming closer to full cost recovery through user payments, especially when their main activity is operation and maintenance of existing infrastructure (Trémolet & Rama, 2012) – but even they are likely to require huge investments for the refurbishment of aging infrastructure³ that tariffs are not likely to

³ The 2013 *Report Card for America’s Infrastructure* estimates that over \$300 billion is needed to address the nation’s sewage collection and treatment infrastructure over the next 20 years, which is twice the current level of investment by all levels of government in the USA. <http://www.infrastructurereportcard.org>

adequately cover. For developing countries, it has become apparent that there is little scope for charging large enough tariffs to recover the very large expenditures required for water and sanitation services.

(3) Funding by tariffs, taxes and transfers (the 3Ts) (since 2003):

Seeking paths to financing the water and sanitation MDGs, the 2003 Camdessus Panel proposed the concept of ‘**sustainable cost recovery**’ where the full lifecycle costs of water services are recovered through a combination of tariffs, taxes and transfers, known as **the 3Ts** (Trémolet & Rama, 2012).

The notion of sustainable cost recovery, now endorsed by the OECD, recognises that using a combination of tariffs, taxes and transfers is a more realistic way for developing countries to finance lifecycle costs of water services, and can be used to leverage other sources of financing (from the commercial and private sector). Sanitation services have a large element of public good so partial funding through government taxes is justifiable. Public funding is also essential to ensure that the poor are not excluded from services (Mehta, 2003). Furthermore, it is recognised that international donors and a range of other charitable entities can make useful contributions towards achieving the MDGs.

Beyond the 3Ts: funding sanitation with 4Ts

An original contribution to the subject of financing sanitation (in contrast to financing water supply) emerged from the DGroup discussion, when Tandukar⁴ recognised that the sale of products derived from waste represents a **fourth T: ‘Trade’**, a revenue stream that is additional to tariffs, taxes and transfers. This arises from recovering the value of nutrients, carbon and water contained in the sewage waste stream, for example, through compost and other fertilizer products, biogas, dried faecal sludge fuel and FS charcoal, effluent aquaculture (fish farming), and effluent irrigation.

The 4th T, available for sanitation

‘Trade’ – revenues from the sale of products that capture the value of the sewage waste stream, such as fertilizer products, fuel products and aquaculture.

There are costs associated with resource recovery, so the *fourth T* is available only when resource recovery systems are designed to yield a *net* revenue (exceeding costs).

Recognising 4Ts can serve as a prompt for sanitation planners to seek to design their systems for net revenues from resource recovery. We will refer to the recovery of lifecycle costs through the 4Ts as ‘**sustainable full cost recovery**’ to distinguish it from ‘sustainable cost recovery’ through the 3Ts that is used in the literature (OECD 2011).

⁴ Bimal Tandukar, SNV Cambodia. Contribution to SNV’s DGroup Discussion, 8 October 2014.

The requirement for sustainable full cost recovery is represented in Figure 3 below.

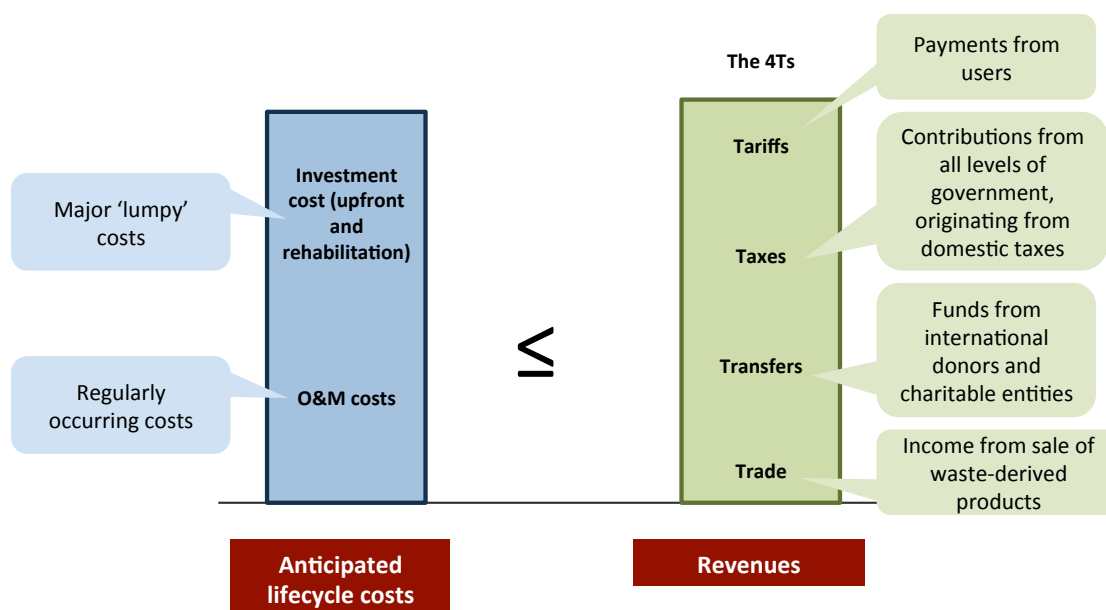


Figure 3: For sustainable full cost recovery over the lifecycle of the sanitation service, the 4Ts streams of revenues should match or exceed the financing requirement (adapted from IRC & WSUP, 2012)

2.3 PLANNING FOR LONG TERM SANITATION SERVICES

When planning sanitation services that can be delivered in the long term, we need to make sure the revenues from tariffs, government contributions, donor support and sewage reuse products (4Ts) can fully cover the anticipated costs over the lifecycle of the service, as shown in Figure 3.

The MDGs and post-2015 SDGs have highlighted the great urgency for both increasing and sustaining access to sanitation services. This requires huge sums of money to provide the for the initial upfront investments (a) in Figure 1. These huge sums cannot be provided immediately through the 4Ts and their traditional sources of grants and donor aid.

There could be a **financing gap** between required costs and potential revenue streams that are available. Sanitation planners in cities and towns frequently regard this as a need for additional donor finance - and when attempts to secure a suitable donor fails, plans flounder (Pers. comm. Kome). Financial planning requires finding the right mix of the 4Ts in order to leverage additional capital, that could be an iterative process (Figure 4).

The discussion in this paper is about finding additional capital in the form of *repayable finance* to 'bridge' the financing gap (OECD 2010). Unlike the 4Ts, repayable finance, as its name indicates, is made available 'now' but has to be re-paid some time in the future – discussed further in Section 3.

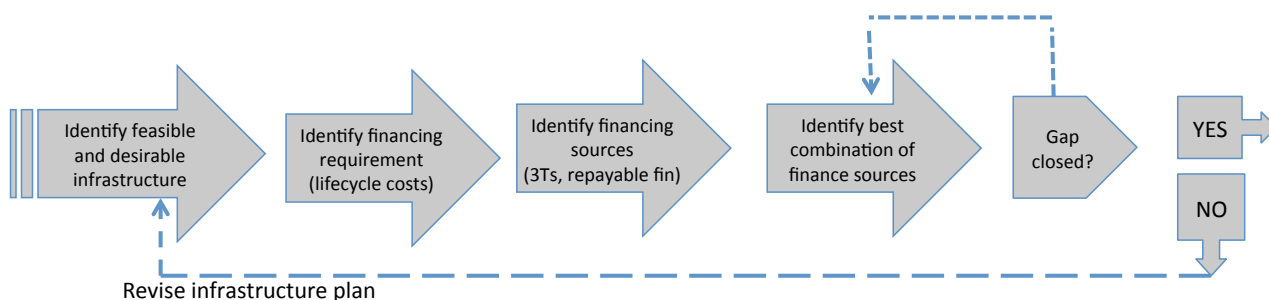


Figure 4: Planning finance is an iterative process of reducing planned costs and identifying a right mix of revenue sources that in combination with schemes for accessing repayable finance, meet the requirement for sustainable cost recovery. If the gap cannot be closed, the sanitation infrastructure plan may need to be revised

The present discussion on the financing gap and repayable finance is in reference to financing the lumpy financing needs only. If the gap meant that ongoing revenues are insufficient to cover O&M costs at a minimum, sustainable full cost recovery would be completely beyond reach. The role of repayable finance is to help manage the timing of required funds. Consequently, the revenue streams need to cover all the lifecycle costs that include debt servicing for repayable finance (OECD 2010).

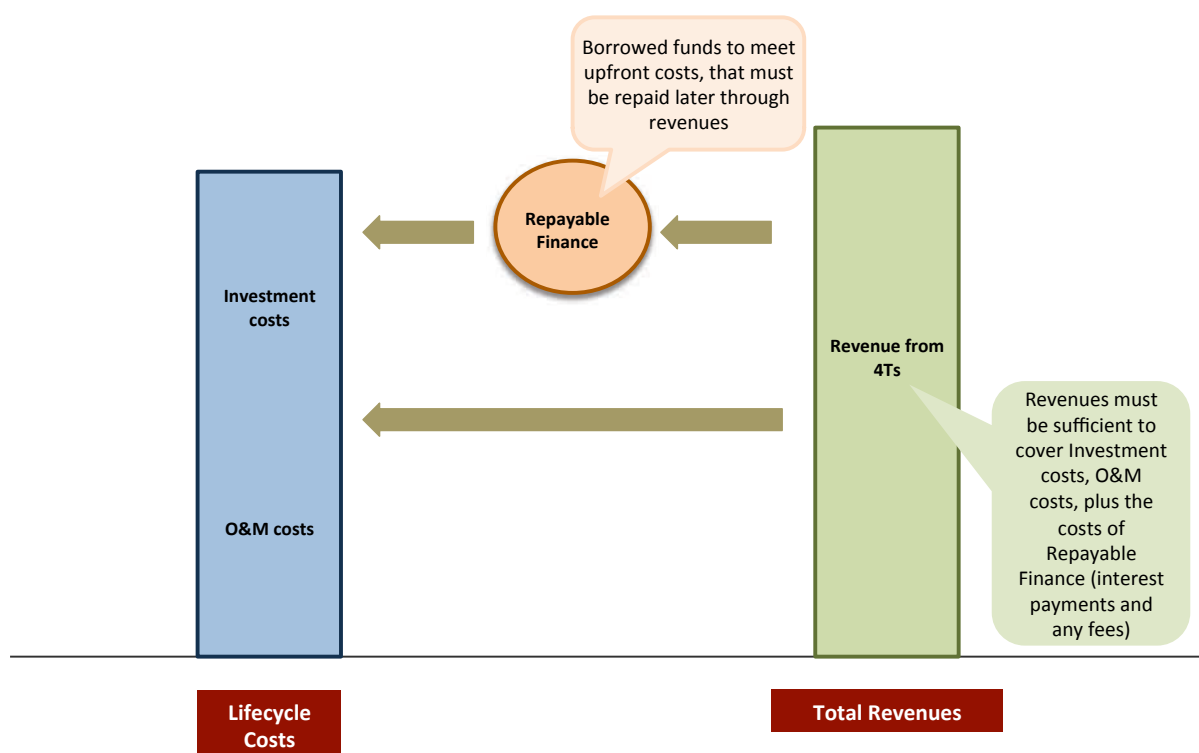


Figure 5: Repayable finance can provide capital for investment in infrastructure while revenues can build up over time. Under sustainable full cost recovery the revenues from the 4Ts must be sufficient to cover lifecycle costs including repayments for repayable finance.

3 REPAYABLE FINANCE

In this section, the key sources of repayable finance are briefly presented, and their potential to be used for financing sanitation for cities and towns is discussed.

Clarification of terminology used in this paper

Finance/financing source:	<i>Where the money can come from.</i> Examples: government; source of <i>overseas development assistance</i> (ODA*); <i>international financial institution</i> (IFI); commercial banks; users
Financing mechanism:	<i>How the money can come from a source.</i> Examples: grant (not repayable); concessionary loan (favourable term loan, often with interest below market rates and initial grace period); tariffs (payments from users); commercial loan (at market rates) etc.
Financing scheme:	Combination of financing mechanisms that are put together to finance a project (examples in case studies)

* note that “ODA” is used to refer to both source and unspecified aid mechanisms (grants, concessionary loans etc.)

3.1 SOURCES OF REPAYABLE FINANCE

The principal sources of repayable finance are **loans, bonds and equity**. When these are structured on purely commercial terms, they can be viewed as *market based repayable finance* obtained through financial markets that facilitate transactions between lenders and borrowers. They are characterised by interest rates that are set by the market, and are provided by entities such as commercial banks, institutional investors, private water service operators, private equity funds, etc. (OECD 2010). However, these sources can sometimes be structured on concessional terms, for example at subsidised interest rates. In this case, they can be viewed as concessional finance.

The uptake of market based repayable finance in the sanitation sector has historically been low due to the financial viability of projects, perceived financing risks, regulatory policies that constrain such borrowing and reliance on traditional financing approaches.

Loans

Loans are described by the loan amount (capital); duration (repayment period); repayment schedule; interest rate (fixed or floating); grace period (usually an initial period when capital and/or interest repayments need not be made); collateral or guarantees (security provided to lender in the event of default by borrower).

- **Commercial loans** are provided through banks based on the creditworthiness of the borrower. Financing can be provided on a corporate basis (where the borrowing entity is a legal entity such as a company) or individual basis (for example to households or unincorporated small business operators). In both cases, loans will reflect market interest rates, and will need to be secured through collateral or guarantees. Alternatively, but far less commonly, if project cashflows are highly secure, ‘the project’ itself can be the borrower rather than the proponents of the project. In this case, project proponents would establish a separate legal entity (Special Purpose Vehicle) to take the loan, which is

underwritten purely by the project's revenues and assets .

- **Government loans** are generally offered at below-market rates with less stringent requirements. The lender may be a national Government Financing Institution (GFI), or Municipal Development Funds (MDF) that lend to local governments for infrastructure investments. Both GFI and MDF may be supported by ODA funds offered on favourable terms (CDIA, 2012).

Repayable micro-finance

Micro-finance is offered by specialised micro-finance institutions (MFIs) that operate on a commercial basis. Micro-finance loans are described by the same elements as any other loan. They differ in being more flexible regarding collateral or guarantees with their lending. The loans are typically shorter in duration, and smaller, and generally charged at a higher interest rate compared to standard commercial bank loans because of higher transaction costs associated with smaller loans⁵.

See Section 4.1 for further details.

Bonds

A government or corporate entity (including local government institutions, where permitted) can borrow money from public investors by issuing bonds at an agreed interest rate for a stipulated amount of time. Bonds have a face value, which is the amount the investor will get back at maturity, and a coupon amount, which is the interest paid each year. From the investors perspective, bonds can range from being a very safe investment to very risky, depending on the credit rating of the bond (and issuer of the bond). (ASIC, 2013)

Bonds have been used extensively in the USA by national, state and municipal governments to raise funds for infrastructure investment including water and sanitation. Municipal bonds or 'Munis' in the US are especially popular with investors because their interest is exempt from US federal income tax and some state taxes⁶.

Equity

Corporate entities can finance investments by issuing shares in a commercial undertaking, giving investors a share in the ownership of the company. While not strictly repayable finance, commercial investors will expect a return on the capital invested through periodic dividends and an increase in the value of their equity.

Shares can be listed on a stock exchange to provide increased transparency and facilitate trading. However, such listing is accompanied by a significant increase in reporting obligations and accountability. Alternatively, shares can be issued and held privately.

⁵ <http://www.microfinancegateway.org>

⁶ <http://www.investopedia.com/terms/m/municipalbond.asp>

3.2 APPLICABILITY OF REPAYABLE FINANCE TO SANITATION

All elements of the sanitation service chain for urban sanitation need to be considered. The entities accessing repayable finance are householders and communities (for investments in user interface and septic tanks/retention tanks, where applicable); and the range of sanitation implementing entities including small and medium scale service providers/enterprises, and local government bodies and utilities responsible for decentralised and centralised systems.

Accessibility to and issues associated with each financing mechanism for relevant entities are summarised below.

Financing mechanism	Accessibility for sanitation service chain
Commercial loans	<p>In developing countries, market-based commercial loans are not used extensively in the water or sanitation sectors, due to constraints on both the supply side and demand side (OECD 2010).</p> <p>On the supply side, commercial banks perceive the water and sanitation sector as being high risk, especially as cost reflective tariffs are rarely feasible when servicing poor communities (OECD 2010). They also lack an understanding of the particularities and needs of local governments, and are not easily able to assess their creditworthiness (GIZ, 2012). Their capacity to compete in this market is also limited by the presence of development banks and international finance institutions who offer preferential terms to the sector (OECD 2010).</p> <p>For players on the demand side, constraints include:</p> <ul style="list-style-type: none"> • Water and sanitation utilities having insufficient revenues to service commercial borrowings as well as day to day operational needs. Legal and institutional frameworks may not allow local governments to access commercial lending. To access commercial finance, local governments also need to have some degree of financial autonomy and the necessary capacities for debt financing and infrastructure provision (GIZ, 2012). When banks do lend to local governments, the repayment periods are typically 3-5 years and up to 12 years, which is generally shorter than required for larger capital investments (CDIA, 2012). • Small scale service providers are also limited in their capacity to access commercial finance, as they are not seen as creditworthy. They often operate informally with no legal registration or assurance of longevity (OECD 2010). • Poorer householders and communities often lack the collateral or creditworthiness to access commercial loan.
Government loans	Government loans are the easiest way for local governments and municipal bodies to raise finance, as the borrower’s (often low) creditworthiness is

	<p>generally not a consideration for eligibility. The needs and interest of local government are understood, and the loan is often accompanied by technical assistance from central government (CDIA 2012).</p>
Micro-finance	<p>Because micro-finance has more flexible approaches to creditworthiness, it is much more accessible to the sanitation sector serving low-income communities than purely market based loans. Historically however, MFIs have been focussed less on the water and sanitation sector. Micro-finance in the sector has largely been concentrated on loans for household-level investment (such as water connections and toilets), and in a few cases, shared communal facilities (Mehta 2009).</p> <p>While micro-finance for SMEs in the water sector have been limited, and stayed at the pilot level, it is an area of significant development potential for small and medium scale sanitation service providers (Mehta, 2008; OECD, 2011; Trémolet & Ravi Kumar, 2013). Scaling up will need to be supported by enabling sector policy including product development support and facilitation, and clarification of legal status and enablement of business development capacity building (Mehta 2008).</p> <p>Micro-finance is particularly suited for relatively small investments with shorter payback times. As such, they may be less suited to larger infrastructure finance for sanitation utilities or local governments.</p>
Bonds	<p>While bonds are a proven method of raising municipal infrastructure finance, local governments in developing countries generally lack the credit ratings that can create bonds with strong investor demand. Regulatory and institutional arrangements including transaction costs relative to the funding required also present barriers to their utilisation for sanitation infrastructure in developing countries.</p>
Equity	<p>Listed equity – where shares (for partial ownership of the utility) are listed on the stock exchange - has been used by both government-owned and privately-owned corporatised water and sanitation service providers in developed and some middle-income countries. The state of development of local capital markets can constrain use of this mechanism for sanitation investments in developing countries.</p> <p>Equity investors have been less interested in water and sanitation sector in developing countries, as returns are expected to be low compared to equity investment elsewhere. However, facilitating the development of local equity markets and other enabling conditions can increase access to equity capital for small sanitation service providers (OECD 2011).</p>

The discussion above shows that the instruments for repayable finance have potential for raising bridging finance for sanitation investments, but also have significant limitations and barriers to their use.

Bringing together different financing mechanisms in innovative ways has been demonstrated as one way of overcoming the limitations and barriers, and unlocking finance required to bridge the

financing gap and sustain the sanitation service chain. As illustrated in the case studies that follow, these innovations typically bring together key stakeholders and combine commercial discipline with concessionary financing arrangements, often supported by ODA in different forms.

Impact investing (or social investing) is another emerging source of finance that could be explored for the sanitation sector. Impact investments are investments made into companies, organizations, and funds with the intention to generate social and environmental impact alongside a financial return. Impact investments can seek returns ranging from below-market to market rates, depending upon the context⁷. Case Study #1 includes social investment.

⁷ Source: Global Impact Investing Network. <http://www.thegiin.org/cgi-bin/iowa/home/index.html>

4 INNOVATIVE SCHEMES TO OVERCOME FINANCING CHALLENGES

Barriers to accessing repayable finance can be lowered by designing financing arrangements that combine repayable finance with one or more of the variety of supporting mechanisms that address the risk and affordability factors identified as barriers in the previous section. Such supporting mechanisms include ODA and central government support in the form of concessionary loans, grants, guarantees from international financial institutions or national governments, etc. These can provide loan subsidies, interest rate subsidies, seed financing for revolving funds, risk mitigation and other applications that can **leverage market-based repayable finance** for sanitation investment.

Thus, the objective of combining finance mechanisms is to **attract funds that would otherwise not be attracted by a given project** whilst ensuring that basic public policy goals are met.

The case studies in this section illustrate how different financing mechanisms have been or are being put together to create innovative financing for the water sector (illustrative case studies for sanitation are included where possible but were harder to come by). Explanations are provided for the key financing mechanisms that are used.

4.1 MICROFINANCE

Micro-finance refers to finance services made available to poor and low-income groups who are in practice often excluded from the mainstream financial system. It incorporates a range of financial services including loans, savings, insurance, remittance transfers and other products.

For the purpose of this paper, and consistency with terminology used by others (Mehta (2008), OECD (2010) and Tremolet & Ravi Kumar (2013)), the term 'micro-finance' refers only to loans (repayable finance, also called microcredit) that can be used for sanitation investment, rather than the broader range of financial services.

Microfinance allows poor households and small service providers to access financial services including loans for investment in sanitation. MF lending makes use of relationships as an alternative to conventional collateral, that can take two forms (Kannan & Panneerselvam, 2013):

- *Relationship-based banking* for individual entrepreneurs and small businesses, where the lender uses personal knowledge of the borrower (this is a model also used in conventional banking (Bharath, Dahiya, Saunders, & Srinivasan, 2007); and
- *Group-based banking models*, where several borrowers come together as a group to access loans. The relationships that form the basis of group solidarity and group responsibility, including group pressure to keep individual borrowers' records clear, serves as a form of collateral for the loan (www.Grameen.com)

If MFIs are to remain in operation, services need to be priced at sustainable levels to cover costs. MFI financing is generally charged at a higher interest rate than commercial loans, due to higher administrative costs associated with smaller loans (it costs more to service many small loans than a single large loan⁸).

However, MFI interest rates are still significantly lower than rates of alternative financing available to the poor, such as money lenders (Tremolet and Ravi Kumar 2013).

⁸ <http://www.microfinancegateway.org>

Although most MFIs started as not-for-profit lending organisations (such as NGOs , credit unions, cooperatives etc.), many MFIs are now for-profit organisations, that could include non-bank financial institutions (NBFIs), commercial banks that specialize in microfinance, or microfinance departments of full-service banks⁸. A few large banks dominate the MFI sector in East Asia and Southeast Asia (such as Bank Rakyat Indonesia and Vietnam Bank for Social Policy). In South Asia, banks and NBFIs are emerging as MFIs but the majority are not-for-profit NGOs (Mehta 2009)

The strongest MFI product in the water and sanitation sector has been retail loans for household water and sanitation, for investment in latrines and onsite facilities or connections to networked services (although to date they have been more focussed on water). Mehta (2009) identifies two further but less common MFI product segments,

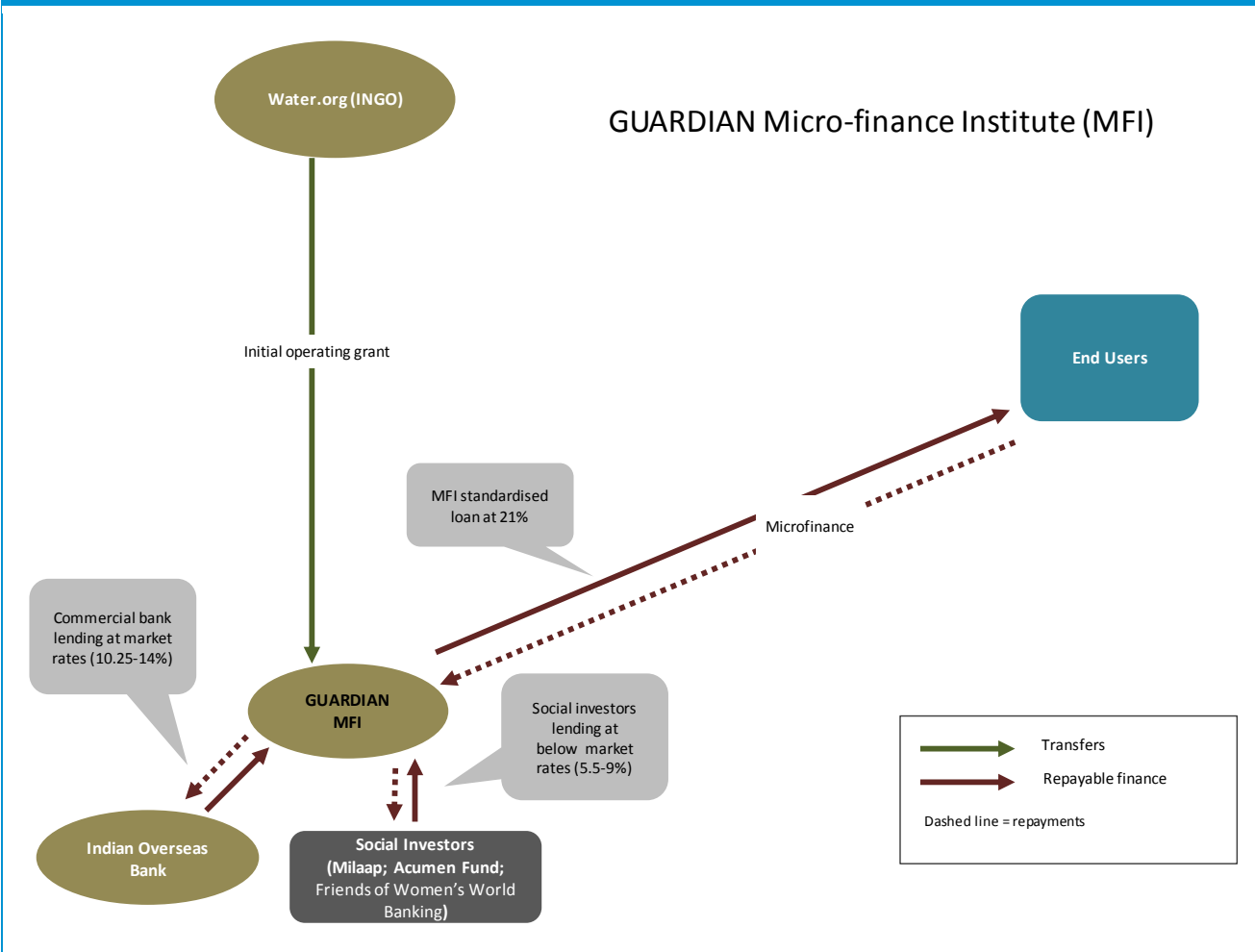
- Loans for upgrading urban services and shared facilities for low income communities
- Small and medium enterprise (SME) loans for investments in small (water) service systems)

The market potential for SME micro-financing has been recognised by banks and financial institutions, who have in some cases set up specialised SME units. SMEs such as small-scale service providers and community-based organisations generally need larger loans than household MF loans in order to finance community-scale infrastructure, that require different loan structures and underwriting methods (Water.org & MicroSave, 2014).

ODA can play a role in developing the use of micro-finance for sanitation by providing seed financing (Case study #1), or combining other financing instruments with micro-finance (Case Study #3), and supporting capacity building activities.

Case study #1: Combining microfinance, commercial loan finance, ODA grants and social investment for sanitation end users (India)

Sources: (Tremolet and Ravi Kumar, 2013⁹)



GUARDIAN (Gramalaya urban and rural development initiatives and network) is an MFI established in Tamil Nadu in 2007 by the Indian charitable trust Gramalaya, which had over 20 years experience in water and sanitation with support from WaterAid UK and Water.org USA. GUARDIAN is unique in being solely dedicated to the water and sanitation sector. It was set up as a not-for-profit, a legal structure that enables it to borrow from commercial banks.

The bulk of its funds (94%) come from commercial bank borrowings at market rates of 10.5-12.5%, supplemented by grants and three social investors.

GUARDIAN offers loans at a diminishing interest rate of 21% (which means interest is applied only to the remaining balance of the debt after repayments are taken into account). This rate is low relative to offerings by other MFIs, where the Reserve Bank of India permits MFIs to charge interest rates up to a maximum of 25%. GUARDIAN charges low fees for loan processing, insurance and administration.

GUARDIAN offers a finite set of micro-finance products, which help keep down costs and complexity: 18 month maximum term for a specified set of investments, namely toilet construction and renovation, biogas plant, water connection (new or renovation), water purification, rainwater harvesting. Fixed amounts are

⁹ <http://www.guardianmfi.org/>

lent for each defined purposes, for example, Rs. 10,000 for new toilet construction. Loans are given to women only, dispersed through Joint Liability Groups or Self Help Group they must be members of. Loan eligibility is based on self-assessment and group assessment of the client's ability to repay, with no other collateral or verification.

A cumulative sum of approx. INR 443M has been lent since inception (approx. AU\$ 41,000), that has provided around 55,000 loans. Repayment rates are close to 99%. Its exclusive dedication to water and sanitation generally allows GUARDIAN only one lending cycle with most clients, resulting in high operational expenses. While it has incurred operational losses since inception, grant funding provided specifically for operating and monitoring expenses enables GUARDIAN to post a net profit. GUARDIAN's operations are mainly constrained by accessibility to adequate loan capital for on-lending.

GUARDIAN has been recognised through several awards, including a Transparency Award (2013) from the Microfinance Information Exchange (MIX) for financial and social performance reporting; Best Product Innovation Award (2011) from the European Microfinance Network, and shortlisted for National Urban water award (2009) from Ministry of Urban Development Government of India.

4.2 RESULTS-BASED FINANCE

Results-based finance describes several financing instruments that provide subsidies upon demonstration of effective and measurable results (Trémolet, 2011). It is an important mechanism that is increasingly used to leverage repayable finance.

They can be used as ODA payments to national governments ('cash on delivery' aid); for block grants and other payments from national governments to local governments or communities; and payments to households as part of behaviour change programs. Many of these instruments have been applied to sectors other than sanitation.

Output Based Aid (OBA) is an instrument within the group of results-based finance mechanisms that is increasingly applied, and gaining popularity with donors to the water and sanitation sector. The Global Partnership on Output Based Aid (GPOBA)¹⁰ has conducted several OBA pilot projects and is implementing several more.

While OBA has been successful in water supply (Case Study #2 and #3), further pilots that address the particular challenges of sanitation are needed. Sanitation is often under-valued by potential beneficiaries, that requires greater social engagement and demand creation (IndII, 2012).

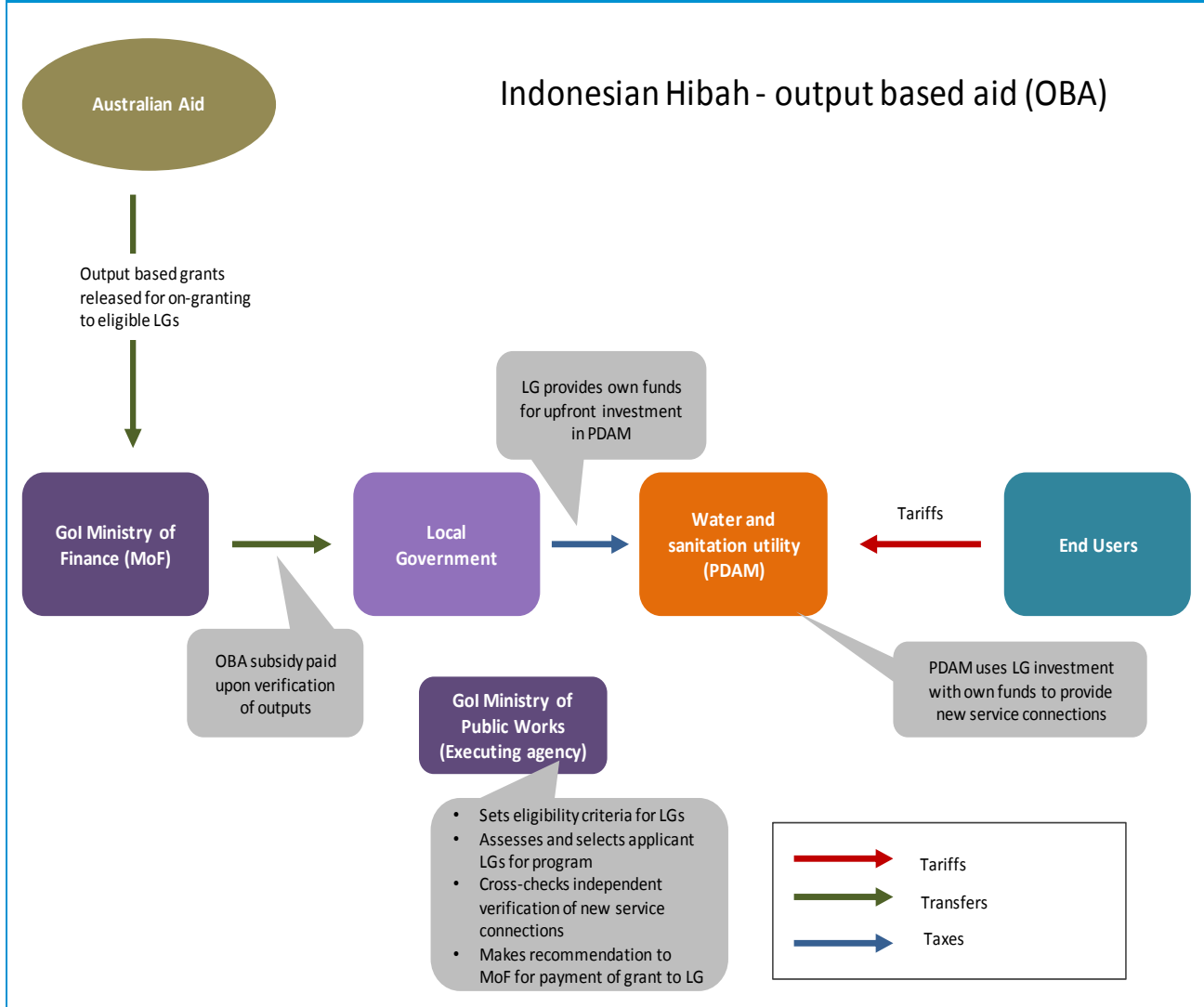
Institutional fragmentation is another barrier in the application of OBA to sanitation, since onsite sanitation is generally under the purview of local governments while off-site sewerage is the responsibility of the water utility. An innovative OBA pilot program commenced in 2011 in Sri Lanka, that seeks to address this barrier by incentivising the national water and sanitation utility to improve urban sanitation at all scales, supporting not only expansion of conventional sewerage, but simplified sewerage, decentralised sanitation and improvements to existing septic tanks as well (GPOBA & World Bank, 2012; NWSDB, 2011). The program targets 15,000 low-income households in Greater Colombo, attracting OBA subsidies of between US\$100 - US\$419 per household for new sewerage connections depending on the type of connection provided and an average subsidy of US\$313 for improvements to existing on-site sanitation services. While some progress has been made with off-site sanitation, implementation of improvements to on-site systems is still under negotiation with local governments (Pers.comm Chandana, NWSDB).

¹⁰ <http://www.gpoba.org>

Results based finance has high transaction costs with their requirements for strong verification of results, but has the potential to promote innovation because they specify in advance the desired outputs of the programme but not the exact mechanisms used to achieve the results. Because OBA transfers risk to the service provider who has to source the upfront finance and deliver the investments before receiving the funds, it is accessible only to service providers with relatively strong financial positions (WSUP & ODI, 2011). Other results based financing instruments have been proposed, such as Progress Linked Finance (PLF), which is designed to provide payments before implementation but after verification that a pre-specified state of readiness has been reached, making finance more accessible. It has yet to be applied in the water sector.

Case study #2: Using output based aid to incentivise local governments to invest in their water and sanitation utilities to increase service connections (Indonesia)

Sources: (DFAT, 2011a¹¹; 2011b¹²)(IndII 2012¹³)



The *Water and Sanitation Hibah* (meaning ‘grant’) is a Government of Indonesia (GoI) program implemented by Ministries of Finance (MoF), Public Works (PU), and Planning (Bappenas), supported through the Indonesian Infrastructure Initiative (IndII) and Australian Aid. Its aim is to incentivise local governments (LGs) to invest in their urban water and sanitation utilities (PDAMs) in order to increase the number of service connections, with 50% of connection targets for lower-income households.

Under the direct funding agreement with GoI, Australian grant funds are transferred to a special account

¹¹ DFAT. (2011). Independent Evaluation of the Water and Sanitation Hibah Program, Indonesia. Retrieved from <http://aid.dfat.gov.au/countries/eastasia/indonesia/Documents/water-grants-ind-eval-re.pdf>

¹² DFAT (2011) Indonesia Water and Sanitation Initiative—Phase 2 Concept Note. <http://aid.dfat.gov.au/countries/eastasia/indonesia/Documents/water-grants-phase2-concept-note-pd.pdf>

¹³ IndII (2012) Australia Indonesia Infrastructure Grants for Municipal Sanitation - Project Design Document. Retrieved April 22nd from http://www.indii.co.id/publications-detail.php?id_news=283

to be held and on-granted to LGs by MoF. Participating LGs enter into agreements with MoF setting out conditions for receiving of the OBA funding, which include making upfront investment in their PDAMs using existing LG funds (allocations of national government taxes and local taxes). The PDAMs use the investment along with their own funds to expand the service network and make new connections. When agreement conditions are met, including at least three months continuous services for the newly connected that is independently verified by an IndII-appointed consultant, MoF transfers the grant directly to the LG's account.

The pilot first phase of the program (2010-2011) was recognised as a great success and a model for replication. The AU\$ 22M water hibah had 35 participating cities exceeding their combined target in providing 77,000 new household connections in 12 months. The smaller sanitation hibah (AU\$ 3M) also made a significant impact although it not reach its target for connecting 7,000 households (a target reduced from 10,000 based on revised costs). The grant provided around IDR 2.6M per water connection (approx. AU\$ 300), and IDR 5M per sewer connection (approx. AU\$ 550). The project evaluation found more barriers to the sanitation hibah - infrastructure challenges, fewer sanitation utilities, and a lower level of perceived value from potential beneficiaries. Nevertheless, the promise of OBA subsidies (both water and sanitation hibahs) leveraged additional investment by LGs, including dormant financial reserves, to extend water supply and sewer mains to unserved areas, with the OBA grant subsidising approximately 30% of investment on average. PDAMs were left free to innovate in meeting local needs. Overall, it resulted in improved relationships and trust between LGs and their PDAMs.

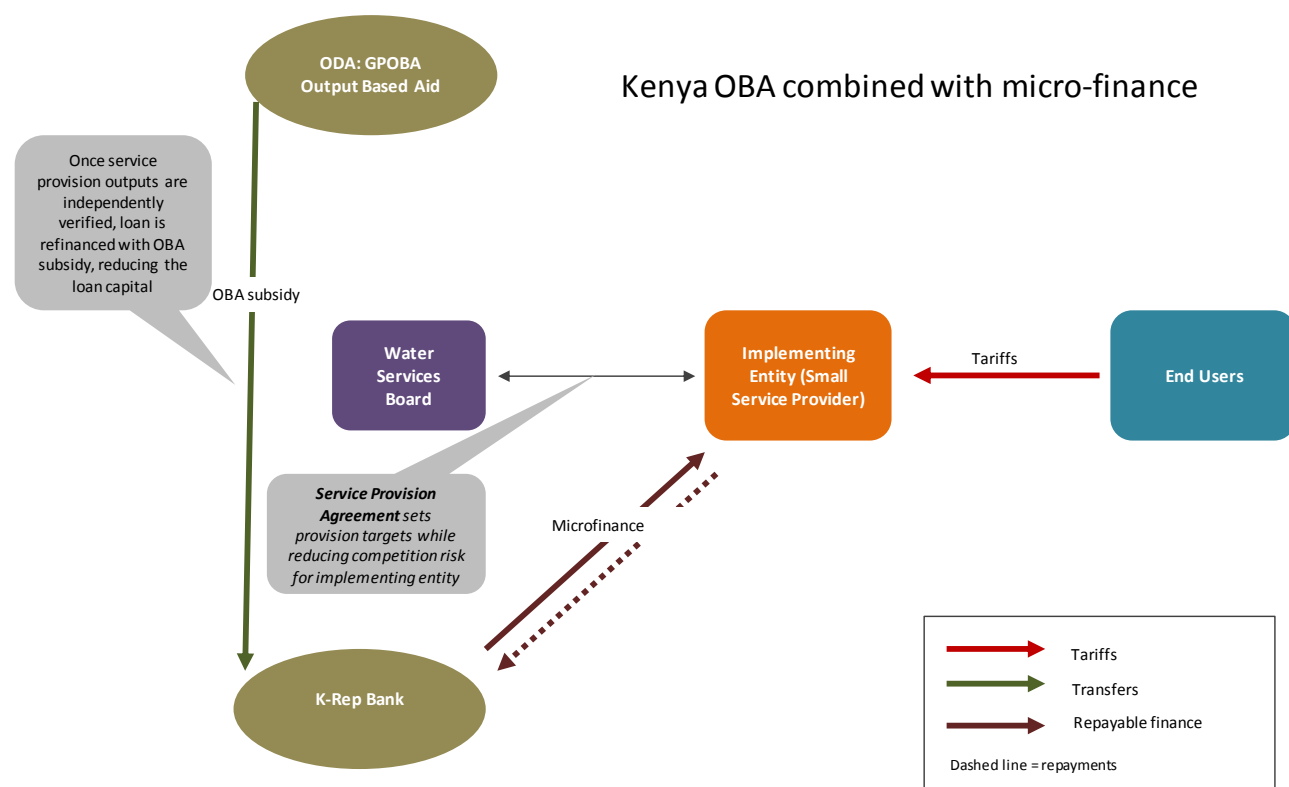
The second phase of the hibah program is currently being implemented (2011-2015) with a significantly scaled up Water Hibah 2 providing a grant of AU\$ 90M targeting 330,000 new water connections, following the excellent results of the first phase. The Sanitation Hibah 2 will provide grants of the same form as the first phase¹⁴, of AU\$ 5M for the implementation of approximately 9,000 new sewerage connections. It will focus on those LGs that have existing sewer schemes and have demonstrated capacity and willingness to proceed with program, with the long term aspiration of discontinuing the use of septic tanks.

Concurrently, IndII is implementing a complementary new multi-year (2012-2014) OBA program for sanitation that targets LGs with no existing sewerage networks (hence cannot participate in the Sanitation Hibah) and incorporates lessons from the previous Sanitation Hibah. The mechanics of the Australia Indonesia Infrastructure Grants for Municipal Sanitation (s-AIIG) are very similar to that of the Hibah, but the AU\$ 40M OBA is designed to stimulate 40 selected LGs to invest in municipal infrastructure for neighbourhood sewerage (simplified sewer systems connected to decentralised or centralised treatment facilities) and solid waste transfer stations. The grant will provide IDR 3-4M per verified connection to a household, with a target of connecting approx. 90,000 households. The grant is expected to provide an average of 60% of the cost of physical works for new infrastructure.

¹⁴ http://indii.co.id/contents.php?id_contents=67&id_ref_menu=70

Case Study #3: Combining micro-finance and output based aid to finance small water service providers (Kenya)

Sources: (K-Rep Bank, 2011; Mehta, 2008; OECD, 2010; Virjee, 2009)



Community based water providers operate many community water projects in Kenya. Sector reforms created an enabling environment for improving the viability of these small service providers. The 2002 Water Act requires small providers to enter into Service Provision Agreements with the local Water Service Board in whose jurisdiction it falls, that define service area boundaries where it can act as a monopoly supplier with limited risk from competing providers, thereby providing certainty of revenue. The Water Services Regulatory Board is supportive of cost-reflective tariffs, allowing financial viability of providers.

Small water service providers usually have limited access to finance, due to factors such as unaffordability of capital due to poverty and investment backlogs, limited collateral, complexity of project finance techniques, and limited capacity in project development. A project to enable small water providers to access repayable finance and capacity building was instigated by the Water and Sanitation Program (WSP Africa), in partnership with K-Rep Bank, an MFI operating in Kenya since 1999. The Global Partnership on Output-Based Aid (GPOBA) approved support for a pilot project 'Maji ni Maisha' (Water for Life) in 2006, that brought together OBA and microfinance. The project has subsequently been expanded with additional funds from the European Union's Water Facility.

K-Rep Bank provides project finance on a fully commercial basis for up to 80% of the total investment cost, with the borrower financing 20%. Under the arrangement, prospective borrowers submit an 'expression of demand' including preliminary feasibility report for the community water supply project for initial assessment by the bank. If approved, the GPOBA provides a project development grant for preparation of a detailed feasibility study including technical assistance subsidies to secure the assistance of a registered Support Organisation. Successful applicants are provided a further technical assistance subsidy (up to US\$

12,600) for assistance from the Support Organisation for project implementation. These steps improve capacity and feasibility for project success.

The verifiable project outputs are the number of new connections and average monthly revenue - measures of the impact on both new and existing customers. Upon verification of outputs by a Project Audit Consultant, GPOBA subsidy refinances the loan, dropping the debt by half (to 40% of total investment cost).

The pilot has generally described as a great success, having resulted in 35 capital infrastructure projects and provision of nearly 12,000 new water connections reaching 190,000 people - almost double the targeted number of people. The weaknesses may be inferred from a call for Expressions of Interest for the next phase of the project¹⁵. These mainly relate to post-implementation project management including revenue collection, loan repayment, clarification of roles and other management and governance issues that affect the commercial viability of service providers, and ultimately the sustainability of the services. Weak capacity and shortage of Support Organisations for providing technical support was not anticipated in the design of this OBA project, and led to project delays (pers.com.Tiwari).

4.3 CREDIT GUARANTEES

Credit guarantees are mechanisms whereby third parties underwrite debt instrument repayments such as loans and bonds. Credit-worthy guarantors are national governments (sovereign guarantees), IFIs and credible international donors and insurers. Guarantees Mitigate risk to lenders and lift borrowers' credit ratings that can lead to better terms for loans – longer repayment periods, lower interest – and improve the credit rating of bonds (OECD 2010).

The most relevant of these mechanisms for sanitation in towns are Partial Credit Guarantees (PCGs), usually provided by IFIs and some international donors (Case Study#5). PCGs cover a specified portion of the debt irrespective of the reason for default. They can be tailored to suit the situation. The level of guaranteed coverage can be designed to lift the borrower's credit rating up to the critical level that allows it to access market finance or to facilitate issue of bonds. They can be specified in local or foreign currency, thereby mitigating foreign exchange risk. Partial rather than full coverage of the debt amount also incentivises the borrower to be diligent in their preparation of projects to make them likely to succeed, and not default lightly.

Other mechanisms that may have some relevance are Full Credit Guarantees and Partial Risk Guarantees. Full Credit Guarantees cover the full amount of the debt, and provided mainly by insurers to improve the credit rating of bonds. Partial Risk Guarantees can also cover the full amount of a debt in the event of default when it is caused by pre-specified risks. For discussion of other types of guarantees to cover risks for foreign exchange and political risks (less relevant to town sanitation investment), see OECD (2010).

¹⁵ World Bank Request for Proposal <http://www.dgmarket.com/tenders/np-notice.do?noticeId=10750436>

4.4 GROUPED FINANCING

The relatively high transaction costs required to raise commercial repayable finance and the need to demonstrate creditworthiness make it difficult for local governments and small scale service providers without a strong credit history to secure such funding. Grouped financing mechanisms seek to overcome these barriers by aggregating a number of borrowers, thereby increasing scale and lowering transaction costs to individual borrowers and spreading/lowering the risk to lenders.

While financing can be raised as a group, lending arrangements could be executed with individual borrowers within the group (Case Study #5) or with smaller sub-groups of borrowers (Case Study #4).

Revolving funds are a grouped financing mechanism that lends money to eligible members of the group for specific activities, and re-lent or revolved to other members when the initial capital is repaid, creating a long term source of repayable finance, generally at below market rate interest (Case Study #4). Seed capital for revolving funds may be sourced from deposits made by each member, or from a government or ODA grant.

Revolving funds operate at scale in the USA, where they are used widely to fund community and rural infrastructure with seed capital from Federal and State grants. The Clean Water Act of 1987 led to the creation of the Clean Water State Revolving Fund (CWSRF) program, that funds wastewater systems and other water pollution control measures¹⁶. The US Department of Agriculture facilitates water and wastewater systems for rural communities¹⁷.

Under the CWSRF program, states provide grants matching 20% of the federal grant that provides the initial funding, which is combined with other program resources including tax-exempt revenue bond proceeds, fund investment earnings and loan repayments, to provide low-interest loans for eligible projects. States administer the loans and set loan conditions that can include repayment periods up to 20 years and interest rates ranging from zero per cent to market rate. A large proportion of the loans are targeted to small and disadvantaged communities experiencing financial hardship. Approximately \$95.8 billion has been provided nationally through the CWSRF program for municipal wastewater treatment facilities. Examples of the types of projects funded include secondary and advanced treatment works, collector sewers, sanitary and combined sewer overflow correction, and stormwater management.

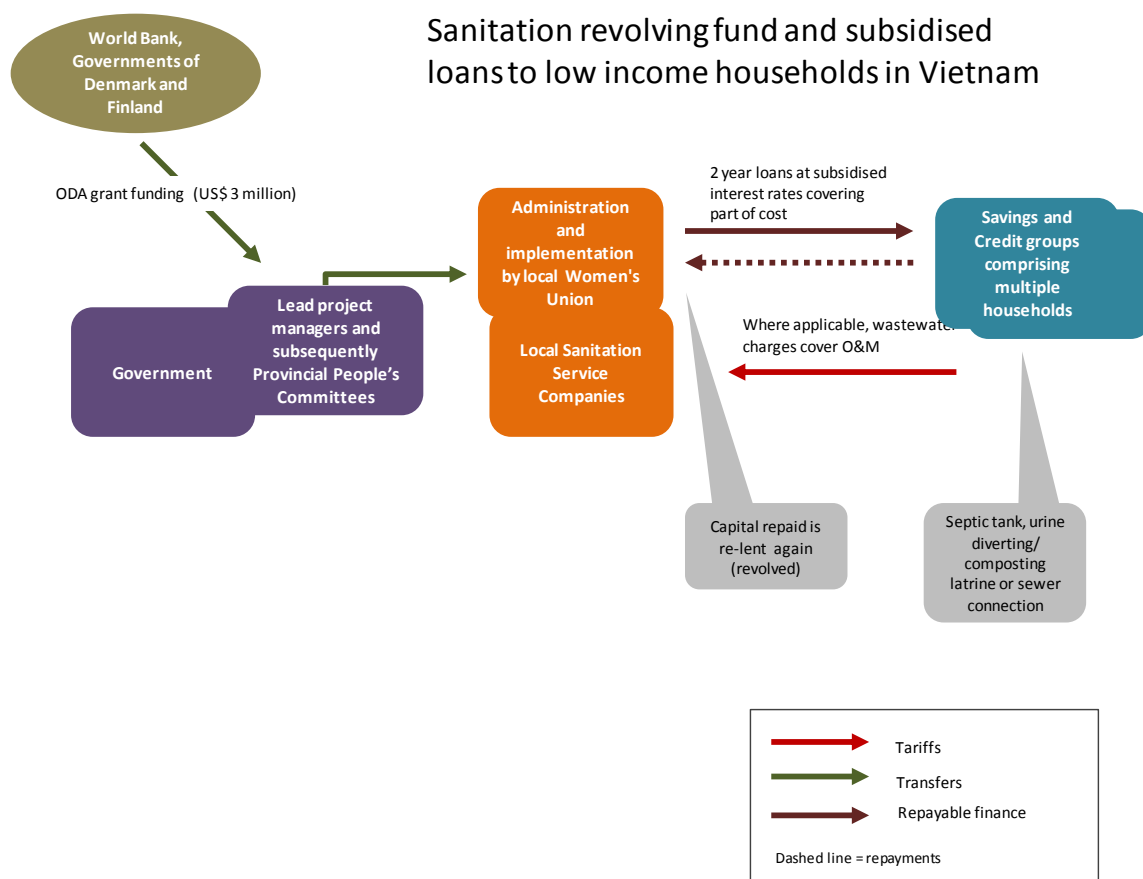
Pooled financing is another mechanism whereby the group is able to raise finance through issuing bonds. (Case Study #5)

¹⁶ http://water.epa.gov/grants_funding/cwsrf/basics.cfm

¹⁷ <http://www.rurdev.usda.gov/uwp-revolvingfund.html>

Case Study #4: Using ODA grants as seed funding for a sanitation revolving fund and subsidised loans to low income households (Vietnam)

Sources: (OECD, 2010; Trémolet, Kolsky, & Perez, 2010)



The Sanitation Revolving Fund (SRF) was a US\$3 million sub component of the much larger Three Cities sanitation project in Vietnam which commenced in 2001 and closed in 2008.

Revolving funds were established for each city to provide loans to low-income households to construct septic tanks, urine diverting/ composting latrines or sewer connections. Funding for the SRF element comprised grants from Denmark and Finland and an allocation from the World Bank project funds transferred by the central government to cities as grants.

In each city, the local sanitation service companies appointed the local Women's Union (who have a track record of successfully delivering such programmes) to administer the revolving funds. The funds were lent to 'Savings and Credit groups' (12-20 eligible borrowers living in close proximity, led by a group leader), with collective responsibility for payment. 15% of the funds in the SRF were allocated to operating expenditure for the SRF and hygiene education. Interest payments on the remaining working capital funded local administrative costs. Complementary software support for sanitation and hygiene promotion through the Women's Union was funded from the main Three Cities sanitation project.

The loans, which covered roughly 2/3rd of the average cost of a septic tank, were to be repaid over 2 years with an interest rate roughly half that of the normal commercial rate at the time. Householders had to secure the remainder from own sources including friends and family.

Households supplied by piped water services and have on-site sanitation facilities pay a wastewater charge

that entitles them to have septic tanks emptied at no additional charge every five years.

During Phase 1 of the project (2001 – end 2004) funds were revolved roughly twice, with very high repayment rates (99.6 – 100%) in all cities. Over a 7-year period, the SRF enabled over 46,000 household sanitation facilities to be installed, all of which were still functioning 5 years after construction, indicating strong buy-in to the scheme.

The strong hygiene promotion program is recognised as a very significant factor in the success of the SRF, which also resulted in 1,700 households investing in improved sanitation without a loan from the SRF.

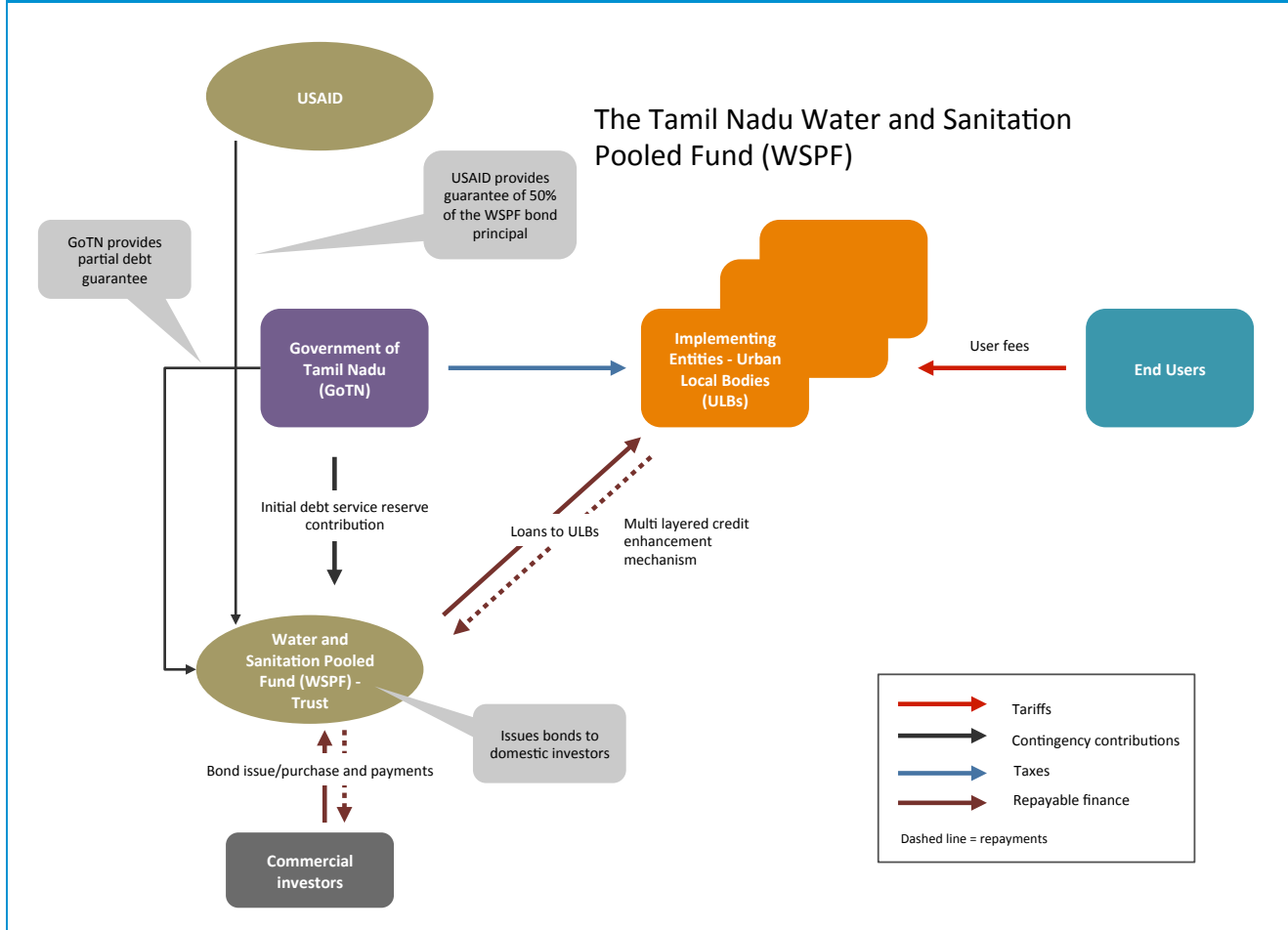
The main limitation of the SRF is that, although all beneficiaries belonged to the lowest income quintile, the very poorest amongst them were excluded because of their low ability to repay loans. On the advice of the Women's Union, it was decided to address this limitation by revolving the working capital until existing demand for the loans was exhausted, then redirecting the capital as hardware subsidies to the excluded group. However, the revolving fund was still in operation at the time of evaluation, so it is unknown whether this approach was effective for reaching the excluded poor.

Another limitation is that due to misalignment with the concurrent sewer extension program, the majority of investment by households occurred in on-site systems. As urban population densities increase, the treatment capacity of on-site sanitation systems will likely be insufficient for the volumes of wastewater of the future, so the investment may not offer a future-proof sanitation solution.

This pilot has since been scaled up by the World Bank with US\$25 million available as working capital, as well as by the Vietnam Bank for Social Policy with separate revolving funds for water and sanitation.

Case study # 5: Combining grouped financing, bonds, and guarantees to urban local bodies (India)

Sources: (USAID, 2003); OECD (2010); TNUDF (2003)



The Water and Sanitation Pooled Fund (WSPF) was set up to enable 13 small to medium sized urban local bodies (ULBs) to raise repayable finance from the capital market on a pooled basis with relatively low transaction costs and without increasing the contingent liabilities of the Government of Tamil Nadu (GoTN).

The WSPF was incorporated as a GoTN-owned trust in August 2002. The GoTN provided an initial debt service reserve contribution, and USAID provided a backup guarantee through its Development Credit Authority (DCA).

The fund is managed by the asset management company of the Tamil Nadu Urban Development Fund - a multi-sector urban development project created in 1996, financed by the World Bank for the development of urban infrastructure in the state of Tamil Nadu.

WSPF issued long term (15 year, with 10 year option arrangement) unsecured bonds¹⁸ to domestic investors to raise funds in Indian Rupees (preventing foreign exchange risk) to be loaned to ULBs.

Market confidence in the unsecured bonds was strengthened through a multi-layered credit enhancement mechanism in the following order to ensure repayment:

1. Escrow Accounts¹⁹ – ULBs are required to make monthly payments from all revenue sources into escrow

¹⁸ Unsecured bonds (also called debentures) are backed by the creditworthiness and reputation of the issuing institution, without backing by any assets as collateral.

accounts they hold, with aggregate amounts transferred to a WSPF escrow account to service bond payments to investors. In the event that payments are insufficient, WSPF has power to tap into ULB bank accounts and/or intercept Government transfer payments.

2. A debt service reserve fund set up and maintained by the Government of Tamil Nadu with liquid investment of Rs 69M (1.6 times annual debt service payment), to be drawn down in the event that funds in the WSPF escrow account are insufficient

3. USAID guarantee for 50% of the principal bond issue with the balance covered by an undertaking by the GoTN to replenish the debt service reserve fund, with the GoTN liability accruing to the relevant ULB/s causing the shortfall.

ULBs' escrow accounts are monitored by the WSPF fund manager, who would coordinate with GoTN in case of a shortfall to trigger the other mechanisms and ensure availability of amount payable to investors in the WSPF bank account 30 days before the due date of bond annuity.

Subscribers were mainly banks and provident fund trusts, whose investment in Rs. 10,000 face-value bonds raised Rs. 304M (approx. AU\$ 11M) in 2002.

Subsequently WSPF has made further issues of bonds in 2008, 2010 and 2012 that raised a total of Rs 1.7 billion, providing 35 ULBs with repayable finance for water and sanitation projects in Tamil Nadu²⁰.

4.5 PUBLIC-PRIVATE PARTNERSHIPS (PPP)

PPPs refer to a range of contracting arrangements by which private sector players can provide some of the activities that the public sector is responsible for. All PPPs incorporate:

- A contractual agreement defining the roles and responsibilities of the parties,
- Sensible risk-sharing among the public and the private sector partners, and
- Financial rewards to the private party commensurate with the achievement of pre-specified outputs.

PPPs offer governments an option to fund capital investment through accessing private sources of capital, without the need to borrow. The public sector can also access the expertise and efficiencies of the private sector, and help drive reform through a reallocation of roles, incentives, and accountability (ADB, 2008). PPPs transfer risk from the public to the private party to varying degrees depending on the particular contractual arrangement.

For the private sector, PPPs provide the opportunity to profit from their capacity and experience in managing businesses (utilities in particular). The private sector seeks compensation for its services and risk-sharing through an appropriate return on investment.

This section first summarises PPPs in general terms, and then provides a brief discussion on their applicability and potential for sanitation in cities and towns of developing countries.

The generic types of PPP relating to existing infrastructure differs from those for new infrastructure (Black, 2009). Types relating to existing infrastructure are summarised in Table 1 below, moving from lesser to greater transfer of risk and responsibility to the private partner.

¹⁹ An escrow account is a special account where the funds between transacting parties are held temporarily in the custody of a trustworthy independent third party, until the transaction is completed with all conditions between the transacting parties settled.

²⁰ <http://tnuifsl.com/wspf.asp>

Table 1: Forms of public- private partnerships relating to already existing infrastructure (adapted from ADB (2008) and World Bank (2004))

PPP for existing infrastructure	Typical duration	Asset ownership	Capital investment	Commercial risk	Responsibility for O&M
Service Contract <i>Private partner provides specific support services for set period.</i>	1-3 yrs	Public partner	Public partner	Public partner	Public partner has responsibility for overall management
Management contract <i>Private partner operates, maintains, and manages the facility</i>	2-5 yrs	Public partner	Public partner	Public partner	Private partner
Lease/ affermage <i>Private partner invests own capital to renovate, modernize, and/or expand the facility and operate and maintain the asset in accordance with the terms of the agreement.</i>	10-15 yrs	Public partner	Shared. Private capital limited to working capital and partial financing of asset renewal.	Shared	Private partner
Concession <i>The private partner gets exclusive rights to operate and maintain the asset over a long period. The private entity has to meet set performance requirements.</i>	25-30 yrs	Public partner owns original assets. Private partner may own extensions and improvements made during the concession.	Private partner	Private partner Public partner frequently shares risk by offering various guarantees.	Private partner

In terms of enabling access to private finance, Table 1 shows that for existing infrastructure, PPPs provide only limited opportunities under lease/affermage or concession agreements, which both require long term arrangements with the private party (up to 25 years).

There are many more types and variants in the types of PPPs possible when new infrastructure is involved. Their contract periods vary depending on the particular context, but need to be long enough to assure the private party of secure returns on investment commensurate with the risks involved. The more common types of PPPs for new infrastructure are summarised in Table 2 below ²¹.

²¹ For more types and details of PPPs see ADB Handbook (2008) and National Council for Public Private Partnerships website. <http://www.ncppp.org/ppp-basics/types-of-partnerships/>

Table 2: Common examples of PPPs for new infrastructure

PPPs for new infrastructure	Description	Access to private capital
DB: Design-Build	The private partner designs and constructs the facilities in accordance with requirements set in contract with public partner, who owns the assets and will take responsibility for the post-construction operation and maintenance.	Depends on contract. Public partner remains financially responsible
DBO: Design-Build-Operate/DBM: Design-Build-Maintain	Similar to DB except private partner is responsible for operation and/or maintenance of facility for a contracted period. The public sector partner owns the assets.	Yes, by fee contract Public partner remains financially responsible.
BOT/BOOT: Build-Operate-Transfer or Build-Own-Operate-Transfer	The private partner finances, designs and builds the facility in accordance with requirements set in contract with public partner, operates the facility for a specified period under a concession agreement, and then transfers ownership it to the public partner at the end of the specified period.	Yes
BOO: Build-Own-Operate	The private partner finances, constructs and operates a facility without transferring ownership to the public partner. There is no obligation for the public partner to purchase the facility or take title.	Yes
Lease/Purchase	The private partner finances and builds the facility, then leases it to the government. The lease payments accrue equity in the facility with each payment. At the end of the lease term, the public agency owns the facility (or purchases it at the cost of any remaining unpaid balance in the lease). Depending on the terms, the facility may be operated by either the public or the private partner during the term of the lease.	Yes

A strong PPP allocates the tasks, obligations, and risks among the public and private partners in an optimal way. In particular the regulatory and institutional framework should be conducive to the goals of the PPP. Regulatory reform may be required to enable effective PPPs, which takes time. When the operating context cannot be changed, the PPP should be designed to accommodate existing conditions (ADB, 2008; World Bank, 2004).

PPPs may appear as an attractive route to accessing capital for sanitation services for municipalities and local governments in developing countries who are often not permitted access to commercial borrowing. It is nevertheless a form of repayable finance provided by the private partner, and adequate revenue streams through the 3Ts or 4Ts to cover payments to the private partner should be ensured.

Private sector interest in PPPs for sanitation has been more muted, with moderate interest in middle-income countries, primarily relating to wastewater treatment facilities associated with centralised sewerage²² (World Bank, 2004). Some specific risks that constrain interest from the private sector (Hutton & Wood, 2013) include:

- Absent, weak and/or inconsistent regulatory contexts
- Sub-sovereign risk: entering into partnerships with local entities lacking financial powers, resources and credit standing
- Contractual risk: projects of long duration entered into with poor initial information
- Risks of political pressure on contracts and tariffs
- Likely low rates of financial return.

The scope for PPPs as a financing mechanism for sanitation in cities and towns will generally be limited while such risks persist.

4.6 PROVISION OF REDISCOUNTED LOANS

Commercial lending to municipalities has been catalysed through the provision of discounted refinance to commercial lenders (Case Study #6). While this appears to be a niche approach, it nevertheless provides a way of incentivising commercial lending to local government entities (if local laws enable this).

Developer Contributions

Developer contributions are upfront charges paid by property developers to utility service providers, that are used to fund additional infrastructure required to service the new demand from the development.

The private partner finances the construction or expansion of a public facility (such as sewage treatment facilities) in exchange for the right to build residential housing, commercial stores/industrial buildings and the rights to use the facility.

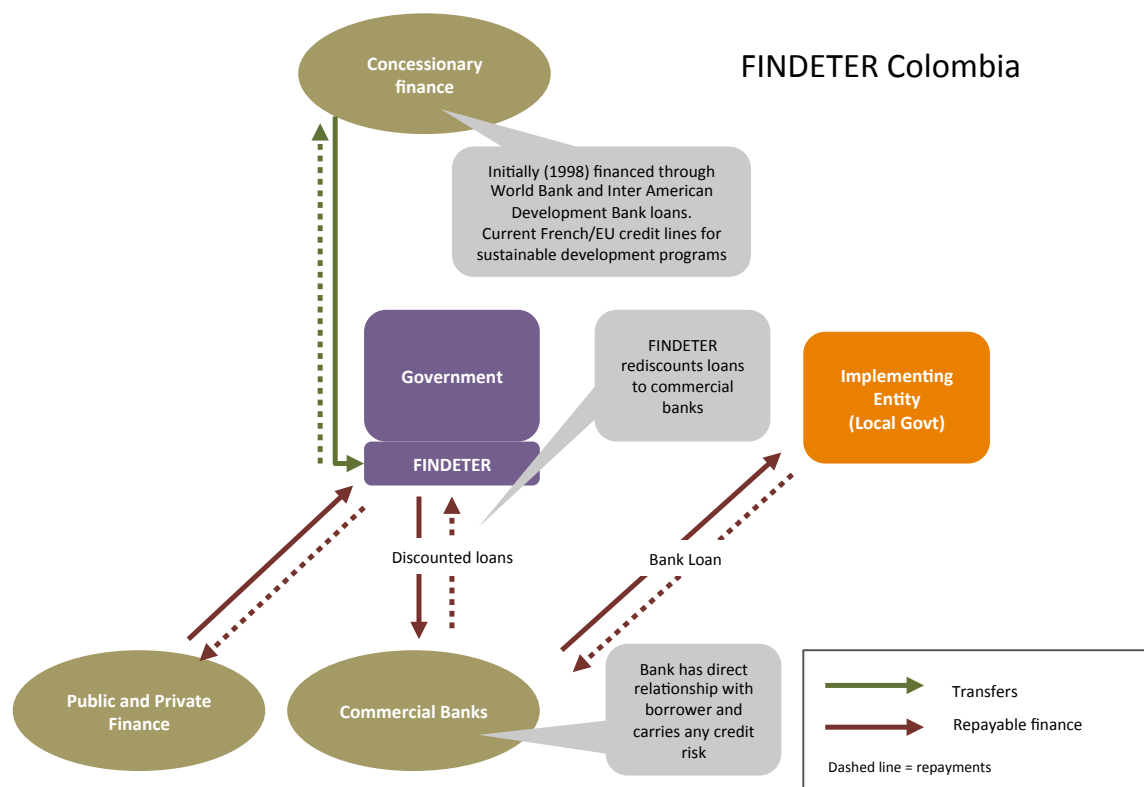
The private developer contributes capital and may operate the facility under the oversight of the public entity, and potentially receive future income from user fees.

This model may have scope for use in sanitation in cities and towns undergoing construction development than many other forms of PPP. It needs to be underpinned by well defined policies ensuring equity and transparency.

²² While interest from small-scale service providers (builders, sludge haulers, etc) associated with on-site sanitation may be regarded as PPPs, these would not be a path to accessing finance.

Case study #6: Facilitating commercial bank lending to municipalities by providing re-discounted loans (Colombia)

Sources: (OECD, 2010²³; World Bank, 2005²⁴; AFD website²⁵; Findeter website²⁶, pers com A.O. Perea (Findeter))



FINDETER is a mixed economy public corporation focused on development, within the Ministry of Finance and Public Credit. The national government of Colombia owns 92.5% of its shares, with the remainder owned by Colombia's government departments. The Colombian government established FINDETER (*Financiera de Desarrollo Territorial*) in 1989 to help support a major decentralisation program by lowering the cost of loans and incentivising commercial banks to lend to local governments who until then had no experience in borrowing from banks. It has been credited with making a significant contribution to the growth of sub-national lending by introducing a number of banks to municipal lending.

FINDETER primarily operates as a second-tier development bank, which means its funds are lent to intermediary institutions (credit institutions such as commercial banks, financial corporations, commercial finance companies), which then lend those funds to local borrowers undertaking

²³ OECD. (2010). *Innovative Financing Mechanisms for the Water Sector*. OECD Publishing. doi:10.1787/9789264083660-en

²⁴ World Bank. (2005). *Local Financing For Sub-Sovereign Infrastructure In Developing Countries : Case Studies of Innovative Domestic Credit Enhancement Entities and Techniques*. Discussion Paper No 1, Infrastructure, Economics and Finance Department, World Bank.

²⁵ <http://www.afd.fr/lang/en/home/pays/amerique-latine-et-caraibes/alc/colombie/projets-colombie/developpement-territorial-urbain> (accessed 7 Feb 2014)

²⁶ <http://www.findeter.gov.co/english/> (accessed 25 Feb 2014)

infrastructure development projects. Under this arrangement, sub-national entities including municipal service providers apply to a commercial bank for a loan. FINDETER appraises the proposal and authorises the first-tier lender to lend to the requesting entity, whereupon the bank makes the loan at a negotiated interest rate reflecting the level of risk of the borrower. The bank then receives a matching loan at a discounted rate from FINDETER. The bank remains responsible for repayment of its discounted loan from FINDETER, regardless of whether or not it receives repayment from the local borrower. This second-tier role distinguishes FINDETER from most municipal development funds (MDFs) that lend directly to local governments and assume the credit risk.

FINDETER finances up to 100% of eligible project costs, with loan terms up to a maximum of 15 years, including up to 3 years of grace period. Without FINDETER, local governments would usually not be able to access loans longer than 5 years. FINDETER also provides support to municipalities to define, structure and implement their development projects and priority investments, which make them more attractive to the banking sector. Large numbers of municipalities have made borrowings over the life of FINDETER, for example in 2012, COP\$ 2.3 billion (approx. US\$ 1.2M) was disbursed to 26 Departments in Colombia and 107 municipalities through FINDETER for 1,469 eligible development activities.

FINDETER was initially set up with the aid of concessionary finance from both the World Bank (through the Colombian Government) and the Inter-American Development Bank (IDB) but has successfully established itself as a viable financial institution, raising funds from both public and private sources through the securities market (primarily through certificates of deposit). It has maintained a triple-A credit rating for the last 16 years (to 2014).

A new line of credit for EUR 150M was provided in 2013 by the French Agency for Development (Agence Française de Développement - AFD) as part of a EUR 5M European Union program in collaboration with IDB to further enhance FINDETER's role of providing strategic, financial and technical support to Colombian local authorities²⁷. This allocation will enable priority local development projects such as providing access to water and sanitation for the poorest communities, supporting responsible water management and improving urban sanitation. Another EUR 5M fund supports FINDETER in lending for projects within the Sustainable and Competitive Cities Program and the Emblematic Cities Program. Both funding programs provide technical support to intermediate and small municipalities.

²⁷ <http://www.afd.fr/lang/en/home/pays/amerique-latine-et-caraibes/alc/colombie/projets-colombie/developpement-territorial-urbain>

5 INSIGHTS AND KEY MESSAGES

Governments have responsibility for enabling sanitation services to their constituents, in line with their role as protector of fundamental human rights, including the human right to water and sanitation. In practice, there are different views about what this responsibility includes and excludes. There was broad agreement both in the literature and in the DGroup discussion, that government's responsibility included regulating of the sector, setting service standards, enforcing compliance, monitoring performance, and facilitating good governance. But there was a diversity of views on whether and to what degree governments should contribute their tax revenues towards funding long-term sanitation services.

A key challenge in the emerging sanitation sector in developing countries is that many sanitation planners do not think adequately about financing lifecycle costs, and make assumptions about the ability of tariffs to cover ongoing costs while also being affordable – which leads to insufficient revenues in practice.

A key message from this paper is that governments' responsibility for enabling sanitation includes contribution of public funds to support sustainable full cost recovery that ensures long-term services that are not reliant on tariffs alone.

With this responsibility comes a need for a city-wide perspective to sanitation budget planning, to ensure effective and equitable distribution of public funds to achieve public health and environmental outcomes.

The following additional insights and key messages for planning finance for urban sanitation can be drawn from the principles and case studies presented in previous sections. While some may appear to be 'stating the obvious', they are included to serve as reminders for use in the exercise that follows – an exercise in thinking through an innovative sanitation financing scheme as a practical step forward.

The 'Sustainable Cost Recovery' paradigm is critical for exploring scalable financing schemes for urban sanitation.

Moving beyond the conventional 'full cost recovery through tariffs' mindset is likely to be the key to securing the financing required to support large scale deployment of sanitation solutions. The proposition of an alternative paradigm for cost recovery that departs from 'full cost recovery through tariffs' is an acknowledgement that affordable and equitable tariffs will never be adequate to fund the costly infrastructure associated with sanitation services in developing countries (especially when pipe networks are involved).

- It reflects the argument for greater contributions from the **'tax'** element of the 3Ts (or 4Ts) given the wider societal benefits of improved sanitation.
- Innovative tariffs and cross subsidy schemes (IRC & WSUP, 2012) can increase the **'tariff'** component of revenue streams, that could underpin a service provider's ability to borrow.
- Revenue streams through **'trade'** of waste-derived products and services can support cost recovery, that has potential to reduce environmental impacts as well.
- While OBA is gaining strength as a lever to access repayable finance as the **'transfer'** element of the 3Ts, there is scope for piloting other forms of results-based finance, especially *Progress Linked Finance* (Section 4.2) with learning goals including learning from failure (Jones, Greene, Hueso, Sharp, & Kennedy-walker, 2013).

Sanitation financing plans must accommodate services for all without excluding anyone

Given the human right to sanitation, sanitation planning needs to ensure that no groups are marginalised or excluded from having access to the full sanitation value chain. The financing schemes in the case studies rely on payments/repayments from users, that are likely to be prohibitive to the poorest of the poor. Microfinance, for example, is not suitable for such groups, for whom grants are more appropriate²⁸. Various forms of cross subsidisation could also have a role to play. The key point is that strategies to prevent marginalisation of some people must be included in sanitation planning.

Sanitation services need to plan for lumpy capital requirements to provide services for the long term

Planning financing for the life of sanitation systems as part of the initial project design/planning process will enable services over the long term. Funding needs are ongoing and 'lumpy', with initial as well as periodic needs for large sums of money in addition to money for day-to-day operations and maintenance. The financing schemes and case studies described in this paper provide a glimpse of the many different innovative ways in which financing mechanisms can be combined to leverage repayable finance to fund lumpy requirements. Assured regular revenue streams that can service repayments while covering ongoing costs is a pre-requisite to accessing repayable finance for financially sustainable services.

The legal, policy and institutional context determine which financing mechanisms are possible

The case studies indicate that there are no 'out of the box' solutions – the combinations of mechanisms have been tailored to fit what is permissible and desirable at each specific location. Awareness of the legal, policy and institutional arrangements that impact on urban sanitation is critically important. For example, whether local governments are permitted to borrow market finance, or keep the money they raise from taxes; or whether policy encourages local governments to borrow market finance (Case Study #6).

Designing financing schemes is likely to be time consuming and involve multiple stakeholders

In the case studies, several different parties have needed to work together to create the innovative financing mechanisms – local governments, States, financing agencies, IFIs. Such collaboration takes time to arrange. This can pose a dilemma as the need for sanitation services for the poor are especially urgent. There would also need to be clear leadership to bring such parties together, which can be particularly difficult to establish if responsibility for sanitation does not rest with a single agency.

There is a need for pilot financing schemes with potential to be deployed on a large scale

The case studies of financing for the sanitation service chain examined have generally been undertaken at a small scale (e.g. community, city level), and with the exception of Case Study #4 (revolving funds), the extent to which they can be deployed on a significantly larger scale is not clear. As emphasised in Figure 4, such scale up would require sustainable ongoing revenue streams from the 4Ts to service debt as well as fund day-to-day operations.

²⁸ <http://www.microfinancegateway.org>

Under the circumstances, innovative schemes need to be trialled specifically with a view to larger-scale deployment (for example state or national level) in mind.

Trends in new finance mechanisms could be leveraged

There are two sources of finance that have potential to finance investment in the sanitation service chain. Firstly there is evidence that output-based aid is gaining favour with donors. This could be a potential source of finance for larger actors who can carry the risk of spending on investment before receiving the funds.

Secondly, social investment is a growing trend, with many who aspire to “doing well while doing good” (Section 3.2 and Case Study#1).

Commercial repayable finance presents an opportunity, provided traditional barriers can be overcome

The uptake of commercial finance by local governments in developing countries is often constrained by prevailing institutional frameworks that prevent such borrowing, and the creditworthiness of local government entities. While the former can be overcome by changes to internal policies and regulations, the latter is likely to require improvements to corporate governance and fiscal sustainability of such entities. The maturity of local financial markets – legal/institutional frameworks and enabling systems will also influence the extent to which local commercial finance can be accessed.

There is a gap in innovative financing examples targeting small sanitation service providers

Although the role of small service providers in providing services in the sanitation service chain is widely recognised (especially with respect to sludge management, but also various other contracting services) more effort is required in enabling them to provide profitable services. Key enabling areas that can be addressed include:

- Certainty of revenues. In Case Study #3, this was provided through the regulatory context that allowed small water service providers to charge cost reflective tariffs and operate as monopolies in their service areas. Charging affordable cost reflective tariffs for sanitation services could be more challenging.
- Capacity to run profitable businesses. Technical support from GPOBA in Case Study #3 supported capacity building activities to enable this. The shortage of entities operating successfully in providing community scale sanitation services is not unique to developing countries. In the USA where there are millions of onsite sanitation systems in operation, the government invested in creating resources to encourage, guide and support businesses to enter and to operate successfully in servicing the sector (ISF & Stone Environmental, 2009).
- A market for services. In addition to promotion of services, there is scope for innovation in encouraging sustained services in less profitable areas and for vulnerable groups of potential customers. For example, households investing in onsite sanitation could be provided vouchers entitling them to a discount on desludging or pit emptying services from a service provider of their choice (Tremolet 2011; WSSCC 2009).

Practical steps forward

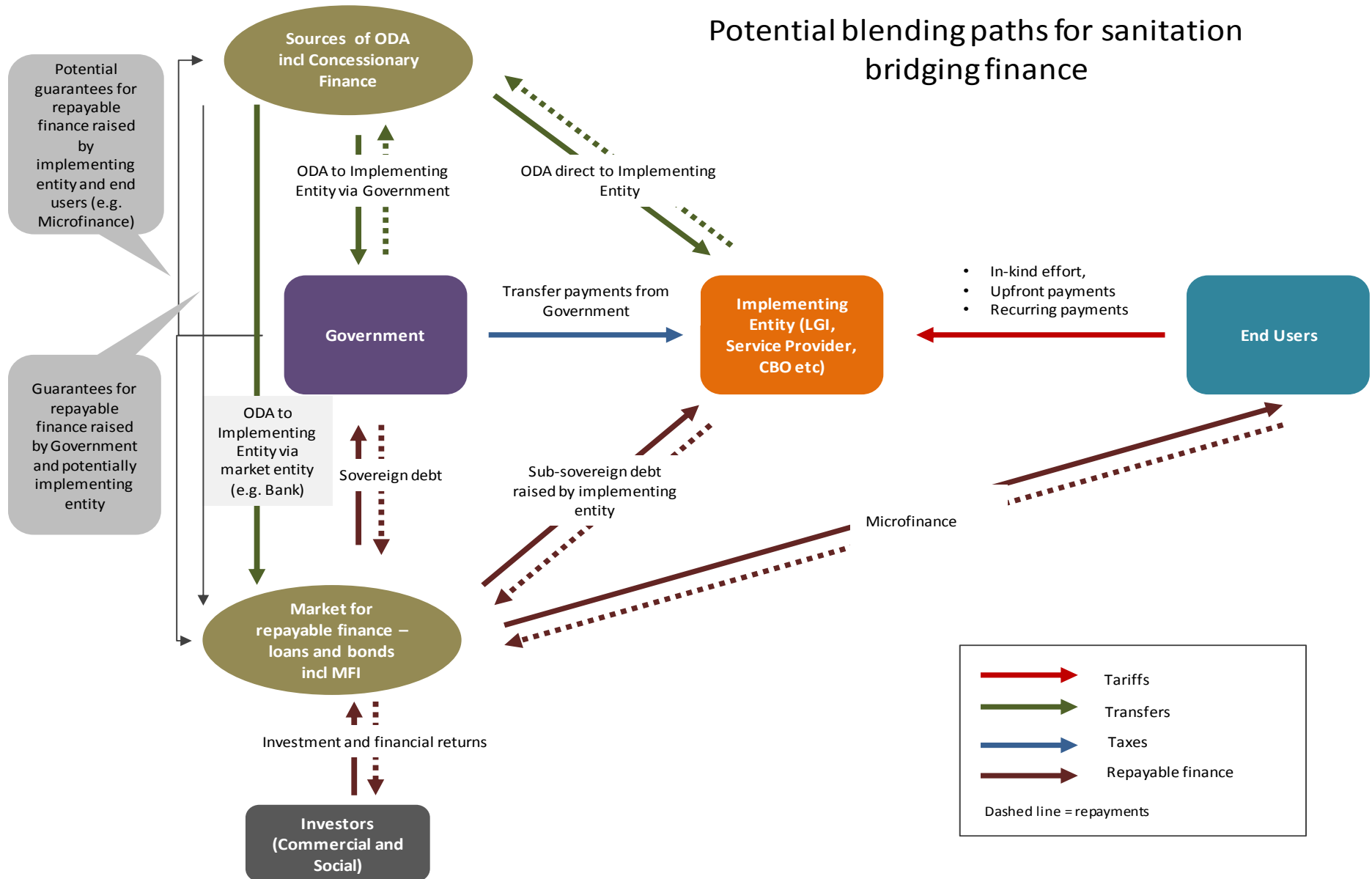
The diagram in the following page is a synthesis of all the financing paths from the 6 case studies in this document.

It could be used as a starting point for conceptually designing financing schemes for a practitioner's specific context. There could be other paths as "... there is almost unlimited potential for innovation in this area" (OECD 2010). The intention of the diagram is to provide a starting point that is not overly complicated.

The practitioner could go through a process of elimination and shortlisting by asking questions such as:

- What financing paths are allowed by my legal, regulatory, policy and institutional context?
- What financing mechanisms fit those paths?
- What needs to happen to enable them to come together?
- Who are the stakeholders with control? Who needs to come together? Who can help make it happen?
- Can this be scaled up?
- Have all the 4Ts been considered for revenues?

Potential blending paths for sanitation bridging finance



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