

# Public Funding for SANITATION



The many faces  
of sanitation subsidies



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Any errors or omissions, however, remain the responsibility of the authors.

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# FOREWORD

There is no doubt that sanitation is one of the most significant development challenges of our time. Two and a half billion people do not have access to an 'improved' sanitary facility, over 700 million Indians are forced to defecate in the open, and in Africa the number of people without sanitation has actually grown in the past decade. There is growing evidence that it is the poorest people in the world who suffer the most, and it is poor families, and particularly poor children, who pay the price through illness, suffering and thousands of early, preventable deaths.

In 2005 The Millennium Task Force on Sanitation called for stronger institutions and better financing for sanitation; better financing including both more money and better ways of spending money. However, working out what needs to be done is not easy. There are many calls on the public purse and even within sanitation it is often difficult to decide on priorities. What is more important? Sewerage connections in this urban slum, or more latrines in that remote village? Wastewater treatment for this crowded and polluted city or more health extensionists in the districts? Even where agreement can be reached there is often just not enough money to do everything that seems to be needed.

The Water Supply and Sanitation Collaborative Council is responding to the challenge in a number of ways. The newly launched Global Sanitation Fund seeks to engage proactively on the ground in countries where there is an agreed plan and consensus on what needs to be done, but where funds are scarce. The GSF finances gaps in sector plans with a particular focus on activities that can increase the use of communities' and households' own potential and resources. GSF works closely with national governments and sector stakeholders to finance key activities in hygiene promotion, sanitation marketing and other critical 'software' aspects of sanitation.

But WSSCC also contributes in other ways; supporting networks at the national level and acting as a clearinghouse and source of reliable, unbiased information with a focus on people-centred solutions. It is in this light that WSSCC has prepared this primer, Public Funding for Sanitation: The many faces of sanitation subsidies. Responding to requests from our National WASH Coalitions, we have pulled together the latest thinking and knowledge on sanitation financing and focused particularly on the sometimes-heated topic of sanitation subsidies. This document is a resource for all those who work in sanitation and who seek sustainable and effective strategies for delivering sanitation to those who need it most.

The need for more and better sanitation is clear; the need for more and better funding follows. We hope that this primer is a valuable tool towards meeting the challenges ahead.

**Jon Lane**  
Executive Director, WSSCC



# INTRODUCTION

## BACKGROUND TO THE DISCUSSION

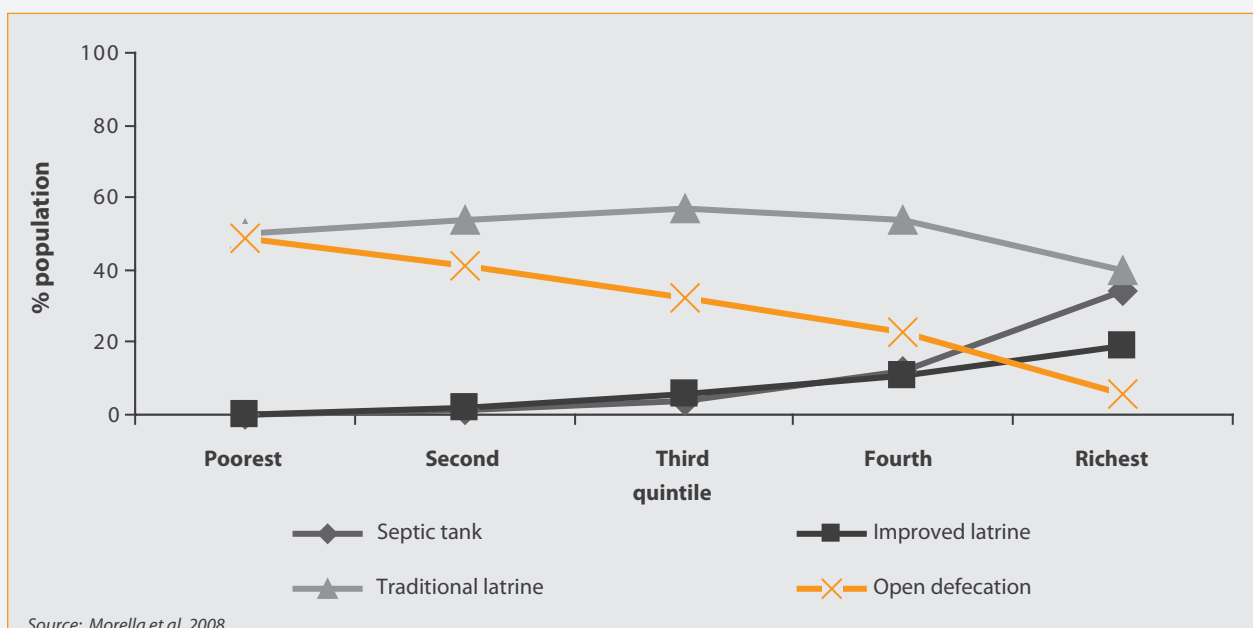
It is well known that very many people (upwards of 2.5 billion) do not have access to 'improved' sanitation. Instinctively we also know that it is the poorest who are worst affected, and a recent study of access to sanitation in Africa confirms this (Figure 1).

Clearly action is needed, and a key element in making progress is the need for both more money and better targeting of that money to achieve improvements which benefit the poor. This document is an introduction to part of the discussion about financing for sanitation and has a particular focus on the thorny issue of sanitation subsidies.

Historically, in now-industrialized nations, funding for sanitation was provided by central and local governments, local industry and philanthropists. Such funding was usually provided to stimulate the provision of public sanitation services in dense industrialized urban settlements in the interests of public health and, to some extent, for philanthropic reasons. The typical pattern of provision saw local authorities providing mains, sewers or dry sanitation systems, storm water drainage and solid waste management services. Provision of in-house facilities was either left to individual households or landlords, with some enforcement of legislation to encourage this investment, or also provided through public finance (Hamlin, 1951, Hamlin and Sheard, 1998 and Eveleigh, 2002). Once urban areas were fully covered, systems expanded outwards into rural areas, although generally with a lower level of public finance<sup>1</sup>. In most of the industrialized world today, coverage with hygienic sanitation is universal and enforced with legislation.

Globally, however, access to basic sanitation is still grossly insufficient. More than 2.5 billion people alive today still need to gain this access, while population growth and the deterioration of existing sanitation systems means that countless more will need to be served as well.

Figure 1: Access to sanitation by income quintile (percentage of population using)



Given that many of those who lack access are extremely poor and given the public health benefits of universal access to sanitation, public funding to increase access seems an obvious policy response [see for example Hall and Lobina, 2009]. However, many commentators have suggested that public subsidies have failed to significantly increase access and may indeed have stifled service provision [Cairncross, 2004, Brook and Smith, 2001 and Foster et al., 2000]. Others suggest that there are insufficient public funds to address the global sanitation crisis, so discussion of subsidies is little more than a distraction [Mehta, 2003, and Lenton et al., 2005] or that inadequate targeting means that the poor do not benefit [Cairncross, 2004]. With the notable exception of a few serious efforts to analyse the impacts of subsidies, many of which are cited here, the argument is often heated and rarely draws on empirical evidence.

Effective management of human excreta however goes beyond the provision of infrastructure to its long-term effective use, operation and maintenance. In rural areas this can generally be managed within the sphere of the household or the local community but supporting activities (software) will be needed. In urban areas long-term management of sanitation usually requires engagement with the wider urban system. In urban areas consideration of financing of sanitation therefore encompasses regulatory institutions, the organisation and management of urban collection, treatment and re-use/disposal systems as well as the users.

This document addresses provision of basic sanitation in both rural and urban contexts and therefore includes a consideration of financing for both on-site sanitation and networked sewerage in urban areas but stops short of a full discussion of water/sanitation utility financing.

## PURPOSE AND AUDIENCE FOR THE PRIMER

The purpose of this primer is to assist the reader to understand the global debate on subsidies and sanitation financing and to provide some guidance on how to select the most appropriate funding arrangements in different situations.

In addition the primer aims to clarify the terminology and language used in the debate about public financing of sanitation and subsidies in particular.

While the decision to write this primer came from a desire by the WSSCC Secretariat to assist the WSSCC National WASH Coalition members and their partners in their discussions on financing mechanisms, the primer was written for everyone interested in informed debate on this topic. The intention is to guide the reader through the debates and point the way to more detailed literature.

## SCOPE

### Sanitation

**Sanitation** in its broadest sense is the collection, transport, treatment and disposal or reuse of human excreta, domestic wastewater and solid waste, and associated hygiene promotion. Because of the primary risk to public health of human excreta in the environment, the focus of this publication will be on the provision of “**Basic Sanitation**” as defined by the United Nations for the International Year of Sanitation Communications Strategy: the disposal of human excreta to prevent disease and safeguard privacy and dignity.

### Subsidy

In economics, a subsidy (also known as a subvention) is a form of financial assistance paid to an individual, a business or an economic sector in order to achieve certain policy objectives. For example, a subsidy can be used to support businesses that might otherwise fail, or to encourage activities that would otherwise not take place<sup>2</sup>.

This definition implies that *any financing for sanitation which does not flow directly from the immediately-benefiting household to the service provider can be defined as a subsidy. Subsidies for sanitation flow almost exclusively from government, or via government in the case of Official Development Assistance (ODA), and sometimes through international non-governmental organizations (INGOs) or national non-governmental organizations (NGOs).* Most of the discussion in this document will focus on government or public funding from a variety of sources.

While the arguments described in the debate hereafter are mainly focused on infrastructure (hardware) subsidies, there are many different ways in which public money flows into the sanitation sector – through salaries of health extensionists, operational subsidies to urban utilities, artificially lowered connection fees, and so on. Many of these financial flows are not generally called subsidies, especially where they deal with ongoing costs such as staff salaries. The main premise of this document is that to understand one type of subsidy (the subsidised provision of hardware) it is essential to understand the entire pattern of public financial assistance to the sector. **In an environment of scarce public money the question is not about hardware subsidies but about the best possible allocation of public funds to the entire sanitation value chain.**

Other terms used in this document are defined in the Glossary.



## STRUCTURE OF THE PRIMER

The primer is laid out in five main parts:

**Part 1**, 'How does Public Funding of Sanitation Work?', discusses what needs to be financed and the sources of financing for sanitation programmes as a whole and examines in some more detail what is meant by public finance and subsidy. It introduces some broad concepts and principles by which public funds can be allocated.

**Part 2**, 'The Debate on Sanitation Subsidies', examines briefly why there is so much discussion on subsidies in sanitation. It summarizes the main arguments 'for' and 'against' subsidies (particularly hardware subsidies) and where possible points the reader to additional reading. Finally, it gives more details on the general principles which can promote good financial design of sanitation programmes.

**Part 3**, 'Types of Subsidies', touches on financing for software activities. It goes on to describe the ten types of hardware subsidies that are commonly used in sanitation and briefly examines the advantages and disadvantages of each along with some examples of their application.

**Part 4**, 'Smart Financing of Sanitation Systems', takes four generic sanitation systems (covering pretty much all the available technical options) and explores what are the real-life options for financing both their capital and operational costs. Private, public and blended financing are considered in each case.

**Part 5**, 'Principles for Improving the Design of Subsidies', summarizes the options and arguments and concludes by reiterating some general principles on making financing for sanitation effective.

A glossary, references, bibliography and notes are appended.

## A NOTE ON SOURCES AND DATA

Many of the commentators who have provided valuable feedback to this document asked why there weren't more examples in the text of the types of subsidies we describe and of their effects. In particular we were asked why we did not cite many studies showing cases where targeted hardware subsidies have been effective. As mentioned above a review of the literature reveals a depressing lack of well-structured evaluations of sanitation subsidy schemes. There is much anecdotal evidence but little hard data. Notable exceptions are the work of Foster, Gomez-Lobo, Halpern, Cairncross, Brocklehurst and Janssens. Valuable synthesis has been done by Mehta, Sugden and Jenkins.

The Water and Sanitation Program is currently completing a six-country study that is gathering detailed information on a number of sanitation financing arrangements including various forms of subsidy. The study by Sophie Trémolet, Eddy Perez and Pete Kolsky entitled 'Financing Household Sanitation for the Poor, A Global Six Country Comparative Review and Analysis' is scheduled to be published later in 2009.

It is hoped that this document will encourage more analysis of the effects of sanitation financing regimes.

# Part 1:

## HOW DOES PUBLIC FUNDING OF SANITATION WORK?

### WHAT NEEDS TO BE FINANCED?

The total cost of a sanitation programme comprises:

- ▶ **Supporting and developing an enabling environment:** These could include expenditures linked to policy development, capacity building, knowledge sharing or coordination. However, it may be difficult to estimate those costs other than by taking a percentage of overhead costs for staff working on policy development at the sector level, either within the government or within donors.
- ▶ **Hygiene behaviour change activities:** This would include hygiene education and mobilization activities in schools, communities and households, social marketing for handwashing with soap, interventions in the design of school curricula and teacher training, etc.
- ▶ **Sanitation marketing costs:** Market assessments, demand promotion, costs of community-led total sanitation activities, interventions to stimulate supply of appropriate goods and services (e.g. training or financial support to private providers), etc.
- ▶ **Cost of public infrastructure and services (capital and operational costs)** of for example schools, public toilets, shared network services; and
- ▶ **Cost of private infrastructure and services (capital and operational costs)** of household sanitation.

Adequate funding is needed for all the elements of the programme. For example, if investments are urgently needed in sanitation for schools, public latrines in market places, and hygiene promotion programmes, these are areas which, almost by definition, need financial support from public sources or explicit policy support to generate private funding (for privately constructed and managed public latrines, for example).

In addition the **long-term** or **lifespan** financing of sanitation is critically important. While much debate focuses on provision of new toilets the real challenge is in

ensuring that they are properly used and managed in the long run.

Only once the financial structure of the whole programme over the long term has been established, will it be possible to judge whether financial support to household investments is appropriate or can be provided from available sources.

At the same time sanitation goods and services may be provided by a range of different providers including:

- ▶ central government;
- ▶ regional/local/urban government;
- ▶ large-scale private sector;
- ▶ the community (often with support from an NGO or CBO);
- ▶ small-scale private sector; and
- ▶ the household through direct provision<sup>3</sup>.

To avoid distorting existing arrangements for service provision which may be working very well, the design of public financing of sanitation also needs to be cognizant of these multiple service providers and not assume that all provision is taking place in the public sector.

### WHERE DO THE FUNDS COME FROM?

The funds for the provision of sanitation goods and services come from only three sources:

- ▶ **Public funds**, flowing through central or local government and raised through general taxation, public borrowing and ODA;
- ▶ **Private funds**, flowing directly between beneficiary households and service providers; and
- ▶ **Semi-public/charitable funds**, flowing in the form of payments made to communities, households or service providers by donors, foundations and other non-governmental organizations.

Gaps in sector finances are sometimes also filled by **market-based funding** through micro finance organizations, banks and commercial service providers. By and large the funds flowing into the sector from market-based sources will all be recouped ultimately from individual households through repayment of loans or the spreading (amortising) of costs (for example by charging a small amount on every monthly water bill) or from the public sector through writing off or guaranteeing debt.

In non-social sectors (pay-to-view television provides a good example), payment for goods and services passes directly from the benefiting household to the service providers. In other words, all the finance is *private*. Several service providers may be involved; a shop who sells the TV and a satellite or cable provider who delivers the service into the house but payment for all their services is made by the household. Commercial service

providers may inject their own funds in the form of advertising and other marketing activities such as 'free' installation, in order to increase their market share.

In a complicated social sector such as sanitation, by contrast, the sources and channels through which funds flow may be much more complex and at least some of the financing comes from *public* or *semi-public* sources.

## PRINCIPLES FOR BROAD ALLOCATIONS OF COST<sup>4</sup>

It is the job of the policy maker (in whatever form and in consultation with others) to consider how grant and concessionary funding (available domestically or through external support mechanisms) and other public money

**Table 1: Nature and Incidence of Benefits**

ELEMENT OF A SANITATION PROGRAMME	NATURE AND INCIDENCE OF BENEFITS	POTENTIAL RESOURCES FROM		
		Household/ community	Market-based resources (private and borrowing)	Public
<b>ENABLING ENVIRONMENT</b>	Largely public due to improved efficiency of public spending  Helps to leverage household and market-based resources			Government funds (mainly national) and some international support
<b>PROMOTING HYGIENE BEHAVIOURS</b>	Public and private due to community-wide health benefits and improvements in health at the household level  Helps to leverage uptake of sanitation		Some private resources from soap manufacturers and suppliers	Government funds (local) and NGO/ donor projects  Local funds for health extension workers, promotion etc.
<b>SANITATION MARKETING</b>	Largely public due to increased demand, greater uptake and supply of more appropriate sanitation technologies		Some private resources from sanitary-service suppliers (i.e. for advertising, R&D, etc.)	Government funds (central and local) for enterprise development etc.  Local funds for health extension workers, promotion etc.
<b>COSTS OF PUBLIC INFRASTRUCTURE AND SERVICES</b>	Locally public - health benefits to wider community, improved school attendance and attainment	User charges for public/community sanitation and for access to e.g. urban sewerage	Some private funds for investments in pay-to-use public facilities, etc.; market-based borrowing may be possible for public facilities (Build, Operate, Transfer schemes (BOTs) and concessions etc.)	Central/ local government funds for sewerage, school sanitation, hospitals, clinics etc.
<b>COSTS OF PRIVATE INFRASTRUCTURE AND SERVICES</b>	Blend of private benefits to households (improved health and convenience) and public health benefits from no open defecation	Household and community capital and operational costs	Borrowing from MFIs/housing finance organizations may be available	Central/local government funds may be available

can be most effectively harnessed to support sanitation often within the context of wider poverty-reduction goals.

The ultimate scale and nature of the sanitation programme should be decided on this basis and not in isolation. Since public money is scarce this decision is highly critical. While it is important to know something of the details of the technical solutions to be used, general principles must also be established.

It may be useful to take as a starting point the principle that the most efficient use of public funds is to maximize public benefits (those that are shared by everyone). The corollary of this is that public funds should *not* be used to finance essentially private elements (such as soap, individual latrines, etc) for which people are willing and able to pay *when private or market-based funds are available*.

From **Table 1** we can see that the elements of the sanitation programme fall into two groups. The first group, consisting of the enabling environment, promotion of hygiene behaviours and sanitation marketing, are often

grouped together as 'software' activities. The second group, public and private infrastructure and services, are often grouped together as 'hardware'. The software grouping has benefits that are largely public and there seems to be limited potential to levy funds for these from household sources (except via general taxation and the public budget). The hardware grouping has a mix of public and private benefits and the potential to levy funding directly from users (households) is higher.

Working from the principles outlined above, this suggests that public funding for 'software' is relatively easy to justify. What is more challenging is to decide to what extent public money can be used to finance the 'hardware' with its blend of public and private benefits. In the next section we turn our attention to the general debate on subsidies in the sanitation sector to try to understand why the topic results in such heated debate.

# Part 2:

## THE DEBATE ON SANITATION SUBSIDIES

### WHY THE DEBATE?

Most governments and many organisations – including WSSCC – aim to support the poor and vulnerable to obtain sanitation services in ways that promote social equity, are people-centred and participatory. Most people would agree that there are strong reasons why people should not live in filthy and unhealthy environments.

For many people it is a short leap from there to a strong argument for the use of hardware subsidies. This is based on two assumptions: firstly that it is lack of funds that forms the primary barrier to access for the poorest, and secondly that the use of hardware subsidies is an effective way of removing this barrier. Given that people understand the word ‘subsidy’ in many different ways it starts to become clear how these non-explicit assumptions can lead to disagreements.

To try to bring some clarity, the section below lays out the main arguments for sanitation subsidies and the main reasons why some people advocate against them.

In the main most of this discussion relates to subsidized provision of hardware (including the construction and operation of collection and treatment facilities, pipes and toilets) but as we have already discussed, it is important to consider these arguments also within the wider framework of overall financing for the sector.

### THE CASE FOR IMPROVING SANITATION

There is little disagreement on the need to improve sanitation coverage. The main arguments include:

#### Environmental arguments

Poor sanitation has a negative impact on the environment both at the local level and in downstream ecosystems.

Contamination of water supplies by untreated waste can limit their safety and sustainability. It can also result in environmental degradation.

#### Societal and public health arguments

The potential economic benefits of investments in sanitation are well documented and include public health improvements, increased attendance and attainment at school, improved economic productivity, and increased security, particularly for women although such benefits are sometimes difficult to achieve or sustain. These benefits, along with fundamental improvements in dignity and comfort are felt by all members of society but particularly women and children (WSSCC, 2006).

#### Political obligations

Many governments have also signed up to a range of poverty reduction goals, including the Millennium Development Goals, regional commitments such as the eThekweni Declaration in Sub Saharan Africa, and national Poverty Reduction Strategic Plans, all of which place some responsibility on governments to improve access to sanitation. Indeed the influence of improved sanitation on all of the Millennium Development Goals is well documented (Lenton et al., 2005).

### THE CASE FOR SANITATION SUBSIDIES

Having acknowledged the strong arguments to improve sanitation access, the next step is to consider how best this can be achieved. Below we review the arguments for using subsidies, and particularly hardware subsidies.

#### Moral arguments

Moral arguments are often used by advocacy groups and politicians to build the political case for sanitation subsidies.

It can be argued that it is a **government's moral duty** to care for its weaker citizens and to provide them with a minimum set of basic services that enable them to live healthy and productive lives (see for example the literature on the Right to Sanitation [COHRE et al., 2008]). Linked to this is an often used argument that it is 'not right' to expect poor households to pay for their sanitation services while richer households, especially those connected to sewerage networks, can access the services at a much lower cost to them.

It can also be argued that governments have a duty to promote **equity**, equal chances and access for all; or to support empowerment of certain disadvantaged groups or people.

For many of these reasons the government of Thailand for example has been a leading advocate of sanitation subsidies, see **Box 1**.

#### Box 1: Thailand's rural environmental sanitation programme

For the past 50 years, Thailand's rural environmental sanitation programme has been incorporated into the country's five-year economic and social development plans. According to Luong et al. (2000) by 1999, 92% of the rural population had access to improved drinking-water sources, while 98% of rural families had access to improved sanitation facilities. As latrine coverage has increased, mortality related to gastrointestinal diseases has decreased by more than 90%.

A key component of the programme was the provision of supplies, equipment and transport; in particular the government supplied adequate latrine pans/slabs and moulds for latrine construction, as well as allocating revolving funds for latrine construction.

### The economic case

These moral arguments for sanitation are translated by economists into a set of principles by which subsidies can theoretically be designed.

Economists start from the premise that individuals and households tend to place a rather lower value on sanitation than society as a whole. Public intervention (sometimes a subsidy) may therefore be required to address the following constraints:

- ▶ **Externalities** – the fact that individual action or inaction has implications for society as a whole that are not mediated by the market; and
- ▶ **Lack of information** – the fact that households do not fully understand or appreciate the positive impact they may gain from improved sanitation, particularly on their health and the environment.

Economists use two terms to describe activities or products whose value to an individual is different from its value to society as a whole: public goods and merit goods. These can be contrasted with *private goods* whose benefits can be captured and protected by the individual who purchases them.

#### Public good

A public good is one that, if consumed by one person, can still be consumed by other people<sup>5</sup>.

The provision of universal sanitation has benefits which are enjoyed by society as a whole and from which no individual can be excluded. Universal sanitation is therefore a public good. Specifically, investments in shared elements (wastewater treatment facilities, sewerage and sludge collection services, hygiene promotion and sanitation marketing activities) have benefits which are shared or public, rather than private. (Conversely, poor coverage or poor functionality can produce a disproportionate dis-benefit – the opposite of a public good.) The public sector therefore has an interest in investing in the public or shared elements of sanitation.

#### Merit good

Merit goods are goods that society thinks everyone ought to have regardless of whether they are wanted by each individual<sup>6</sup>.

An investment in sanitation by an individual or household has benefits for society as a whole (by removing pathogens from the environment). At the same time an individual household's decision to invest in sanitation has little benefit for themselves if others do not similarly invest. This, combined with high costs means that many households tend to under-invest in sanitation. However we know that investments in sanitation have high levels of societal benefit. In other words at low levels of coverage sanitation is a merit good whose benefits exceed the value placed on it by individual households. The public sector therefore has an interest in changing individual choices to increase the level of investment in sanitation and move society towards universal sanitation.

In most of the situations in which National WASH Coalitions are active, it is this merit good aspect of sanitation that is most important. Poor households have limited funds and tend not to prioritise investments in sanitation. Some policy makers argue that subsidies will offset these effects and ramp up the rate of investment in a sector with significant and important benefits for everyone. (Interestingly, Community-Led Total Sanitation counters this argument by using a non-hardware-subsidy approach while emphasising the character of sanitation as a merit good requiring community responsibility. See **Box 4**.)

## THE ARGUMENTS AGAINST SANITATION SUBSIDIES

There are essentially two arguments against the use of sanitation subsidies, both of which relate to what can go wrong when subsidies are poorly designed. The first argument is that subsidies can have a negative effect on the viability of the sector as a whole. The second is that subsidies can have unexpected consequences on household and community behaviours and outcomes. These are both arguments of caution and should be borne in mind as sanitation financing is designed.

### Unintended consequences for the sector

At the sector level the use of subsidies can both constrain and distort the provision of services.

#### Many subsidised latrines are unnecessarily expensive.

The traditional focus on subsidizing latrine construction in rural areas often turns out to be an expensive choice. For example 'Government Latrines' must be of a high standard with expensive materials, etc, thus pushing up costs, and sometimes producing latrines of better construction than houses.

**Subsidies may distort other sources of funding.** In addition to raising costs, the delivery of infrastructure, operational and regulatory subsidies all have the effect of 'crowding out' other sources of funding (from households) who prefer to wait for 'free' goods rather than accessing credit or paying for their own investments. This in turn stifles the financial market for credit services.

**Subsidies may stifle innovation.** This usually happens because subsidized latrine programmes are managed centrally and specify what type or types of latrines can be built. This prevents local innovation and can be particularly problematic in countries with widely varying geographical conditions. It also tends to distort the behaviour of private sector providers (who may focus for example on producing standard latrines called for by a government programme rather than on innovation).

As a consequence of the first two failings **many subsidy programs are simply not financially sound and there is not enough money to pay for them.** While many governments would like to provide free services to large numbers of people, this is rarely financially sustainable (**Box 2**). Mehta and Knapp (2004) show that there is simply not enough public money to close the sanitation gap through infrastructure subsidies in most countries. Subsidy schemes that are not well financed eventually cease to function, resulting in low coverage or poor sustainability and lots of unserved people who are disincentivized/demotivated to pay for their services since their 'neighbours' were given a subsidy. At the same time a government's drive to deliver a sanitation subsidy

programme can become so great that it **redirects funds away** from other high priority social sectors.

### Box 2: Unsustainable subsidies in Senegal and Ecuador

The recent six country study by WSP showed that the Programme d'Assainissement Autonome des Quartiers Periurbains de Dakar (PAQPUD) offered a wide range of appropriate sanitation solutions and benefited over 400,000 people over six years. Unfortunately it then had to stop when funding ran out, 'wasting investments in demand promotion until the programme was extended with additional financing'. The PRAGUAS programme in Ecuador in rural and small towns enabled 140,000 people to gain access to improved sanitation over the course of four and a half years, but the cost of the subsidy was high (USD 210 per sanitation facility) and accounted for 60% of the total programme costs.

Trémolet et al. (forthcoming).

### Unintended consequences at the household level

As well as distorting the national programme, the delivery of a subsidy sometimes fails to meet its objectives or has adverse effects at the household or community level. Unintended consequences may include:

**Poor targeting** resulting in the 'wrong' households benefiting from the subsidy. Subsidies may be captured by the more wealthy households or communities. Poor targeting means that fewer needy households benefit and results in the use of public funds to supplement the livelihoods of non-target households. An interesting analysis of this effect in the urban water supply sector in India can be read in Foster et al. (2002) and the same analysis applies in many cases to urban sanitation. Yepes (1999) also showed that subsidies through the tariff failed to reach the poor in Guayaquil in Ecuador.

**Poor delivery** may mean that the wrong types of services are subsidized (for example latrines that are too expensive). A recent initiative of the European Union provided subsidies for small towns who needed to construct sanitation facilities to meet EU water quality regulations. However, in Hungary a lower-bound limit on the size of the systems that were eligible to receive funds had the unintended consequence of forcing very small rural communities to join together to build expensive widespread networks when small decentralized systems would have been cheaper<sup>7</sup>. This may compound problems of targeting (since the types of services on offer may not be relevant to needy households) and may also constrain the reach of a programme by using scarce public money to finance solutions which are unnecessarily expensive.

**Dependency** which occurs when subsidized services become the norm and communities or households cease to make independent investment decisions, preferring to wait for 'subsidized' public services (Jenkins and Sugden, 2006).

**Box 3: Examples of subsidies that have ‘gone wrong’**

Until 2008 the **Senegalese government’s** policy was to provide water service to all households through private connections and official, licensed vendors at standposts. The standposts are seen as a temporary method of supply, and the goal is eventually to provide each household with a private connection. For poor households the government provides a small diameter (15 mm) private connection at a subsidized rate – these are referred to as ‘social connections’. However, Brocklehurst and Jansens (2004) observe that this policy suffers from a ‘major flaw’: the very criteria that make a household eligible for the subsidy more or less guarantees that it is not poor, because in order to obtain a social connection, an applicant must have title to the land, and an existing house must be located on it. A household that can afford this, and can afford to build a permanent house, is not among the poorest of the poor. This subsidy is thus not targeted at the poorest although it may achieve some increase in overall access. (Similar schemes for sanitation also exist and are also likely not to provide benefits to the poorest households).

Poor targeting and the high hardware subsidies in the **Andhra Pradesh TSC** project in India and the **Lodhran Pilot Project (LPP)** in Pakistan have led to a shift in the balance of these programmes towards serving the non-poor, with few of the poor benefiting from the high hardware subsidies.

In the Andhra Pradesh Project the State Government used food-for-work rice as payment for latrine construction. However, as rice stocks ran low an equivalent cash subsidy replaced the rice provision. Three million toilets have been built at a cost of INR 281 crores (EUR 52.3 million) but only half of these latrines are used (Heierli and Frias, 2007). Many poor households knew little of the sanitation programme and built toilets for reasons other than safe excreta disposal. Robinson (2005) found that some built for the free rice, some built to gain a convenient washroom, and some built because the Gram Pachayat was paying.

Robinson (2005) also observed that the benefits of the LPP sewerage schemes, which were 50% funded by local or external donors, have been accrued largely by better-off rural households. Those who already had toilets and septic tanks had connected easily to the new sewer network, and were more able to afford the expensive scheme contributions. In contrast, the poorest households were either excluded from the sewer network, or unable to utilize it until they had constructed a costly toilet and t-chamber.

**False demand** when households take a subsidized toilet or service because it’s available without truly wanting it. This is also likely to arise when hardware funding is not accompanied by sufficient investment in software. Goods and services purchased under these conditions may never be used or may be used for other activities once the programme ends – **as in the Andhra Pradesh project described in Box 3**. They are also likely to be badly managed and may fall into disrepair quickly.

**Unsustainable latrines are built** when subsidies are associated with one particular type of good (for example a type of latrine), thus skewing demand. This may result for example in households choosing pour-flush latrines over dry toilets even where water scarcity prohibits the proper operation of a pour-flush latrine. In South Africa the government’s subsidized latrine building programme

has resulted in construction of many direct single pit latrines which now leaves municipalities with a huge backlog of latrines whose rapidly filling pits are almost impossible to empty safely (Eales and Potter, 2008).

## CLARITY OF OBJECTIVES

One of the main problems with the design of sanitation financing appears to be that the disparate objectives of any public subsidy remain non-explicit. Thus different observers may attach different levels of priority to different objectives. For instance, the main objective of a subsidy scheme might be to ensure inclusion and empowerment of certain disadvantaged groups but it might equally be to protect the environment or to improve public health. It may also be political – to raise votes through hand-outs. Clearly in this situation the different observers are likely to have differing opinions about the success of the subsidy.

The ‘political’ objective is particularly problematic. It is rarely made explicit, but can be a very important force when trying to alter or improve sanitation financing that is heavily reliant on government subsidies. It is also probably one of the major reasons why the topic of sanitation subsidies is so divisive. In fact, in many countries subsidy is a highly politicized issue and it is essential to be aware of implicit objectives of a subsidy scheme, in addition to the explicit ‘official’ objectives.

## SOME PRINCIPLES FOR SMART SUBSIDY DESIGN

The above discussion highlights the need for care and caution in the overall design of the public financing of sanitation. The design needs to take into account not only current but also future considerations, and not only intended but also unintended consequences. The WSSCC/WHO (2005) Programming Guide publication lays out the following principles, which remain useful and valid, for the design of sanitation subsidies:

- ▶ **Subsidies should achieve the intended policy outcome:** this requires not only smart subsidy design but clarity up front about what the policy objectives are. Choices and tradeoffs need to be made between different interest groups, the wealthy and the poor, rural and urban populations and short- and long-term objectives.
- ▶ **Subsidies should reach the intended target groups:** this again requires clarity on who is the intended



target group and how they can best be reached. It also requires that rigorous monitoring is in place to track how subsidies are reaching the intended groups.

- ▶ **Subsidies should be financially sustainable:** this requires a solid understanding of the potential scale of needs and the costs of the programme. Costs include both upfront capital costs and long-term operational and maintenance costs even in rural areas. It also requires a good understanding of how to get the best possible leverage (increase) in funding from other sources (typically households and market sources). Only on this basis can a sustainable financial regime be put in place.
- ▶ **Subsidies should be implemented in a clear and transparent manner:** finally, since they involve the use of large sums of public money, subsidy programmes need to be clear and transparent, enabling eligible households or communities to access them and providing clear recourse mechanisms in cases where there is a suggestion of impropriety. Proper monitoring and evaluation is an essential element of such transparency and must be fully financed as part of the subsidy programme.

# Part 3:

## TYPES OF SUBSIDIES

The debate about subsidy schemes described in Part 2 is largely focused on experiences with infrastructure subsidies (often called **hardware subsidies**). However there are a wide range of subsidy mechanisms that can be used to deliver public financing to sanitation. This part of the primer describes the principle types of subsidy of relevance in the sanitation sector.

### FINANCING FOR SOFTWARE

Part 1 laid out some principles for sanitation financing that suggested that public financing for *software activities* can generally be justified. This would include (but not be limited to):

- ▶ Capacity building and training
- ▶ Development of promotional materials and campaigns (often known as Information, Education and Communication or IEC)
- ▶ Monitoring and evaluation systems and processes
- ▶ Financial management, budgeting and advocacy in the national planning process
- ▶ Recurrent budgets of health extension workers (or similar) responsible for hygiene behaviour change activities
- ▶ Market research and development of sanitation marketing activities
- ▶ Recurrent budgets for school sanitation and hygiene programmes

While this type of funding is often difficult to track it delivers benefits that are clearly public. It has the advantage that it can be delivered in ways which do not skew demand or influence the supply of sanitation goods and services in inappropriate ways and it does not suppress the willingness of households to invest their own resources in the sector (economist use the term 'crowding out' to describe this effect).

It is vital that these costs are fully accounted for in the planning of a sanitation programme as they can be significantly large and recur over many years. A programme which cannot provide needed recurrent budgets for staff and for ongoing software activities is unlikely to be sustainable.

Once the software elements of the programme are fully funded the outstanding question remains, to what extent and in what form should public money be channelled to hardware? The options for the delivery of hardware subsidies are described below.

### TYPES OF HARDWARE SUBSIDIES

#### Introduction

Ten types of mostly hardware subsidies are introduced in the sections below. These are summarized in **Table 2**.

#### Direct subsidies

Direct subsidies involve the payment (in the form of cash or vouchers) directly to the recipient household which is then able to 'spend' to access a range of services.

Direct subsidies have been little used in single sector interventions because of the high costs of identifying the most needy households. However, if the poorest households can be accurately identified, direct subsidies are both efficient and effective. Chile has long used direct subsidies for a basket of social services and they are also popular in many European countries where they are sometimes delivered as tax credits or repayments from the tax system for households with particular needs. The Chilean system is widely regarded as efficient and relatively free of errors of exclusion (inadvertent exclusion of the needy) and errors of inclusion (inadvertent support to non-needy households). For a longer description see Foster et al. (2000).

#### Infrastructure subsidies

The use of public money to construct new infrastructure is one of the most familiar forms of subsidy.

In **rural areas** and some urban contexts the most common form is payment of part or all of the cost of household toilets. This is generally described as a subsidy for the 'private' element of the system and is justified on the grounds that cost is the most significant barrier to certain households accessing services. Targeting may be done through means-testing, geographical targeting, or by subsidizing only certain levels of services (a basic single-pit latrine for example). Trémolet et al.

(forthcoming) found that well-targeted infrastructure subsidies had made a positive contribution for reaching the hardcore poor in both Maharashtra in India and in the Dishari project in Bangladesh.

Traditionally funds are handled by a public-sector provider who delivers the new facility to selected households. In some cases households need to make a contribution in cash or labour to access the subsidy. In India for example, for many years households were eligible for construction of a Twin-pit Pour-flush latrine once they had dug the two pits required. The limited success of this approach led, in 1999, to a redesign of the Indian sanitation programme, now entitled the Total Sanitation Campaign (TSC). The approach now relies much less heavily on infrastructure subsidies, which are only provided to the poorest families once a community has achieved 'open-defecation free' status. This output-based approach appears to have resulted in better targeting. A recent study by WSP suggested that in Maharashtra less than 10% of the people who received the subsidy were not eligible and only 10 to 20% of eligible poor families did not receive the subsidy (Trémolet et al., forthcoming).

In urban areas public funds are typically mobilized to pay for shared elements of networks (sewers and treatment for example) and such subsidies are (perhaps erroneously) regarded as normal and proper, even when the benefit is primarily a private good for those fortunate enough to be able to connect. In general this type of subsidy benefits richer urban elites through the provision of 'below-cost' networked sewerage services. Household subsidies for onsite sanitation are also sometimes provided in urban areas.

Theoretically in urban areas infrastructure subsidies could also be used to improve access to and quality of sanitation services through the provision of special facilities designed to improve services for the poorest and least well serviced. Examples of this might include the construction of transfer stations for proper disposal of pit wastes in poorer urban areas, or the provision of bulk connections to the sewerage network for poor communities willing to manage their own local service arrangements for themselves<sup>9</sup>. It can also include construction of public latrines in public places such as bus stations and markets and may also involve part financing of shared or community-managed latrines in informal or high-density areas.

A general problem with infrastructure subsidies is that inadvertent targeting may occur because particularly advantaged groups (e.g. those with land tenure, or those who are literate and can apply for a subsidy) are disproportionately benefited.

## Connection subsidies

Many urban utilities charge households to connect to networked sewerage services. Households are often charged a 'fee' for the new connection, plus part or all of the capital costs of connecting the house to a sewer in the street and often must also pay a 'deposit' on some or all of the assets provided. Typically these connection costs can be very high and are often regarded by utilities as an important income stream. From the householders point of view however high one-off connection fees can form a very real barrier to connecting to the public services, see for example Kayaga and Franceys (2007), who found that in Uganda the mean cost of a new water connection was USD 500 (median of USD 197) – unaffordable for households earning USD 2 per day. The levying of such fees is inherently anti-poor since the poor are least able to pay. Evans et al. (2002) also point out that it is anti-poor because poor households account for a disproportionate number of unconnected households. In effect payment for connection represents a cross subsidy from the unconnected to the connected who are often benefiting from artificially low tariffs (see consumption subsidies below).

The barrier created by high costs of connections can be easily removed either by amortising the costs of new connections across all utility bills, by providing credit, in the form of staggered payments over months or by the provision of a direct subsidy to targeted households to cover the costs (a connection subsidy). Output-based arrangements (see below) are particularly well suited for the delivery of connection subsidies. All of these have progressive outcomes and promote rational decision making by the utility.

## Operational subsidies

Operational subsidies involve the payment of money to a service provider to offset some or all of the costs of supplying a service. For example, in urban areas, a utility service provider may receive annual payments from central government to offset operational losses from its business or to pay for an artificial lowering of water or sanitation tariffs. This tends to be a blunt instrument with poor targeting, resulting in a disproportionate benefit to the rich.

Operational subsidies for utility operations and software services are often ignored in policy debate. They are rarely fully transparent but often represent a very significant transfer of public funds to the sanitation sector. In addition, they can end up encouraging inappropriate capital investment in infrastructure with very high running costs, because the service provider has no incentive to strive for cost-effectiveness or efficiency of the service. If the utility charges very low tariffs the subsidy may be very large and as it recurs every year it places a heavy burden on the public budget. If sufficient

public money is not available the utility will be forced to under-invest in maintenance, resulting in poor operation of the sanitation system, which in turn may pose risks to public health and the environment.

#### Box 4: The Improved Latrines Program in Mozambique

The Improved Latrines Program (*Programa de Latrinas Melhoradas* – PLM) was initiated in Mozambique in the early 1980s in very difficult circumstances, including civil war and extreme poverty. The programme aimed to provide low-cost sanitation solutions to households in peri-urban areas through a network of latrine and slab producers in all main cities. These producers are referred to as “PLM workshops” by the programme and they are neither purely public nor private. The approach to the programme has evolved substantially over the years. Over the last 17 years, the programme has benefited almost 2 million people in peri-urban areas of all the major towns. The average hardware cost of the sanitation solution built under the programme (the improved latrine) was around USD 70.

The programme initially helped setting up these production workshops, through a combination of software support (training activities, etc.) and subsidies (in many cases, the land on which the workshops operate was provided for free by the government). From 1992, the government started providing production subsidies to the workshops based on their sales (as such, the programme can be seen as an early form of providing output-based subsidies). The subsidies were intended to cover between 40 and 60% of production costs (depending on the region, to reflect differences in input costs and poverty levels) and to reduce the sale price to households. From 1994, the government (with external donor support) also financed the costs of ‘community animators’ to carry out social marketing and sanitation promotion campaigns (it is not possible to estimate the value of such software support, however, as this system has since been dismantled following decentralization).<sup>9</sup>

Text drawn from Trémolet et al., forthcoming.

#### Box 5: Cross-subsidies – sanitation surcharge in Burkina Faso

Burkina Faso has achieved more positive results than most countries in financing urban sanitation through its policy of adding a sanitation services levy on all water bills. The levy (or surcharge) was first introduced in 1985 but utilization of these fees to support on-site sanitation didn’t start until the 1990s; since then it has shown how leveraging is effective in facilitating household investment in the sector. Savina and Kolsky (2004) identify the following aspects of the surcharge as having contributed to the success in spurring sanitation investment:

- ▶ Use of the surcharge for certain aspects of sanitation only. Money is used on sanitation promotion rather than on building toilets.
- ▶ The direct transfer of surcharge revenues to a dedicated sanitation account, without the intervention of central government.
- ▶ The existence of clear indicators of the surcharge’s ‘performance’ in stimulating demand.
- ▶ The levy and use of the surcharge by an operationally and financially viable organization.

### Subsidies to small-scale operators

A less common form of operational subsidy is provided to bring down the costs of operation of small-scale service providers (the types of small enterprises that build latrines or empty latrine pits for example). These can be provided in the form of subsidized training and the provision of central business development services such as business planning, accountancy and auditing, although these may sometimes be included in the software for a sanitation programme. More pertinently here such subsidies may also be provided in the form of guarantees and subsidized loans to purchase start up equipment for small operators, which will have the effect of reducing the costs of services to the end user. Subsidies to small-scale operators can be highly effective in some locations but it is important to have a good understanding of the market for their services and the availability of suitable entrepreneurs with capacity to absorb and make use of any subsidies on offer (see **Box 4**).

### Cross-subsidies

A cross-subsidy occurs when one group of users contribute to part of the costs of providing services to another group. Cross-subsidies through the tariff in the water sector are relatively common and theoretically in some urban areas there is also a cross subsidy for sanitation – with high-volume water consumers paying more for sewerage services than those who consume less, even though each group benefits equally from the operation of the sewerage network and treatment plant. In practice the effect of this cross subsidy is usually rather limited since most of the poorest households are not connected to the domestic water supply network and fewer still benefit from networked sewerage.

In urban networks another type of cross subsidy, between connected and non-connected households, is also possible through the collection of a sanitation ‘surcharge’ on the water bill or through the amortising of all the costs of new sanitation services within the structure of the water tariff (see **Box 5**).

In rural areas some programmes use cross subsidies designed and wholly generated within the community to support the poorest and least-able households to construct or purchase new latrines or other sanitation services. This type of cross subsidy uses households’ own money directly; the flow of funds is not through the public purse. In this sense, this type of subsidy differs from the others described in this section. An advantage of this type of subsidy is that it gives communities and households a large say in the financing arrangements they choose. Cross subsidies within the community do have some possible negative side effects, as they can interfere with the social relations between different groups and may put some households in ‘debt’ in some subtle way to others.

Interestingly a recent study by WaterAid suggested that the *process* of assessing needs at the community level through a community-led wealth ranking exercise was at least as, if not more, important than the existence of an external subsidy in determining equitable outcomes in a sanitation programme in Nepal. This suggests that cross-subsidies may work well when the facilitation of the process is good (Jones et al., forthcoming).

### Consumption subsidies

In many urban areas tariffs for sewerage services are kept artificially low. This represents a subsidy towards the cost of 'consumption' of the service, or a consumption subsidy. When prices are kept low in this way, the service provider will inevitably sustain losses. These losses must either be covered through operational subsidies to the supplier or they will result in systematic underinvestment in routine maintenance and rehabilitation of the network. In the cities and towns of the south, systematic underinvestment is common and typically includes failure of the utility to, for example, repair leakages or expand the network to new areas<sup>10</sup>. This, in turn, may lead to environmental degradation and the need for high rehabilitation costs or premature replacement. It also means that there is no money available to extend services to unserved areas, which are usually characterized by higher rates of poverty than the already-covered areas. This type of funding arrangement therefore represents a kind of reverse cross-subsidy between potential future users (who are thereby excluded) and existing users.

### Output-based subsidies

Output-based subsidies are delivered against services successfully delivered (effective sanitation) rather than inputs (excavation, pipes and toilets). Thus an output-based subsidy might be paid to a utility company when they have connected poor households to the sewerage network and demonstrated that a service is being provided for a pre-agreed period. Output-based subsidies can also be provided to operating companies running sewage treatment facilities or private pit-emptiers (for instance through voucher schemes) if they can increase the amount of faecal sludge delivered to the plant from poorer neighbourhoods using on-site sanitation. In rural areas similarly, an output-based subsidy might be paid to a local government or service provider if they can achieve 100% reduction in open defecation in certain communities.

Some countries offer a community-wide award (or reward) to communities who achieve certain aims – typically the elimination of open defecation. This type of award is increasingly common in South Asia for example where it is offered in tandem with CLTS-type interventions. Typical of this approach is the Nirmal Gram

Puraskar programme in India, which offers awards at the Panchayat (village) and District level. Independent verifiers assess progress and the awards are presented by the President of India. The money can be spent in the area on any development projects.

The advantage of output-based subsidies is that they are only paid once services have successfully been delivered – thus removing one of the major drawbacks of more conventional infrastructure subsidies that may be paid to a service provider who fails to deliver a working service. In this way they represent an efficient way of spending public funds. However the cost of the services may rise due to the fact that the service provider must finance the investment upfront and only recoups the costs once the services are being delivered. Like other subsidies, output-based subsidies rely on good quality verification and monitoring. However, unlike other forms, the verification process can be driven by the users themselves and their verification that services have been delivered. The costs of verification can be relatively high, although this is probably more a reflection on the lax monitoring of conventional non-output-based subsidies than a criticism of output-based subsidies themselves, where verification is required to trigger payments.

### Regulatory advantages

Inadvertent subsidies occur when policy is used to favour certain types of service delivery. For example in urban areas large-scale utility providers may benefit from regulations that grant them operating monopolies in certain areas, or from technical norms and standards that favour networked sewerage over more decentralized sanitation. These types of regulations tend to encourage the tolerance of inefficient monopoly utilities. They may also raise the operating costs of smaller service providers (by requiring them to meet unreasonable standards to participate in the market) and therefore constitute a subsidy to the larger-scale operators. This type of subsidy is usually hidden or unclear and may have little positive benefit for the majority of householders.

### Subsidized credit

A final mechanism for the delivery of public funding into the sector is through subsidies and guarantees to micro-finance institutions (MFIs) who can then lend money for sanitation investments to households at reduced interest rates. MFIs may also provide other important services, such as micro-savings and micro-insurance which can also enable more households to make needed investments and manage their sanitation facilities over the long term. Channelling public money through MFIs has the dual advantage that it stimulates the development of micro finance services and leaves households in control of decisions about the type and cost of services to be paid for. It also has the advantage

Table 2: Summary of Types of Subsidy

	HOW IT WORKS	
	Urban	Rural
<b>DIRECT SUBSIDIES</b>	Payment direct to individuals or households. Payment may be in the form of cash, voucher or tax credit. Householder or individual spends the money either freely or on specified goods and services.	
<b>INFRASTRUCTURE SUBSIDIES (PRIVATE FACILITIES)</b>	Public sector provision of latrines or latrine parts, usually through direct implementation with some input (cash/labour) from households.	
<b>INFRASTRUCTURE SUBSIDIES (PUBLIC FACILITIES)</b>	Public sector provision of shared elements of the sanitation system.	
<b>CONNECTION SUBSIDIES</b>		Cost of connecting is covered by a transfer from government to utility, through vouchers or by transfer from general utility revenue.
<b>OPERATIONAL SUBSIDIES</b>	Operational Expenditure (Opex) subsidies to utilities and local government service providers.	
<b>SUBSIDIES TO SMALL SCALE OPERATORS</b>	Funding for training, business development services, product development etc. plus access to subsidized credit or subsidized goods and services resulting in lower costs to customers. Small-scale operators may build or service toilets and sanitation systems in rural and urban areas.	
<b>CROSS SUBSIDIES</b>	Transfers through the tariff from high- to low-consumers or from connected to unconnected households.	Transfers (in cash and labour) from richer to poorer households to construct latrines.
<b>CONSUMPTION SUBSIDIES</b>	Subsidies through reduced tariff or deferred maintenance.	Rarely relevant.
<b>OUTPUT-BASED SUBSIDIES</b>	Subsidies paid only after delivery of a service (working latrines being used, open defecation-free communities, delivery and treatment of faecal sludge at a wastewater treatment plant).	
<b>REGULATORY SUBSIDIES</b>	Preferential legal rights for selected (usually large or public) service providers. Technical norms and standards and licences allow only selected service providers to construct publicly-funded facilities.	Selected service providers.
<b>SUBSIDIZED CREDIT</b>	Interest payments on micro-finance services are kept low by provision of bank guarantees or other support to micro finance providers if they lend for sanitation goods and services.	Households whose primary barrier to access is financial.

WHO BENEFITS?	ADVANTAGES	DISADVANTAGES
Household/individual can access services. Where supply is not constrained specific suppliers may also increase market share.	Empowers the household/individual and stimulates the supply of goods and services without constraining the market.	Expensive and complex to administer – probably not viable except when bundled together with other social services when targeting becomes cost-effective. Does not take into account longer term Operation & Maintenance (O&M).
Household/individuals who receive the subsidized latrine. Theoretically community through demonstration effects.	If well targeted enables poorest households to access services.	Expensive, with limited reach. Tends to skew/fix technical designs at 'high-cost' end and stifles market/self provision and innovation. Open to perverse incentives. Does not take into account O&M.
Households connected to a working system.	Ensures public benefits from urban sanitation.	Does little to benefit those who are unconnected. May divert resources from getting existing system to work. Does not take into account O&M.
Unconnected households (particularly the poor) living in areas covered by sewers.	Very effective at reaching the poorest (who tend to be unconnected) and increases connectivity to the system, which improves operational efficiency. Ensures public benefits from urban systems.	If funds are provided through a transfer from general utility revenue then this may result in increased costs for other services, or underinvestment in operation and maintenance. Only relevant where households can connect to operational network.
Connected households.	Addresses long term O&M.	May damage long-term sustainability of utility operations by building in inefficiencies and low-tariff/poor service equilibrium.
Households who use small-scale operator services – including potential new customers who can then access services.	Enables extension of services to new households and reduction of costs for existing served households – particularly the poorest who often use the services of small-scale providers.	Has limited/slow effect in areas where private sector activity is limited. Some risk of failure of some small operators resulting in lost investment.
Varies with type of subsidy.	In rural areas the community may be efficient at targeting and allocating resources. Can also be used for O&M/upgrading in urban areas.	In urban areas targeting may be poor and system may fail if utility finances are weak. In rural areas can be captured by elites.
Connected households only.	Cheap to administer and can theoretically be targeted through increasing-block tariffs or other disaggregated consumption tariffs. Requires operational subsidies.	May damage financial status of utility further, maintenance backlog increases risk and reduces capacity to connect new households.
Target households – payment is only made if they receive a service so accountability is high.	Prevents wastage of public money paying for inputs that do not result in desirable outcomes. Encourages efficiency and accountability.	Complex to administer and investments must be pre-financed.
Selected service providers.	Assured minimum standard of service for those connected.	Tends to stifle the private and informal sector, and constrains households willing to self-provide.
Households whose primary barrier to access is financial.	Does not distort the market for goods and services and stimulates micro finance interest in sanitation. Households retain control.	Requires competent micro finance providers, can be complex to administer and requires good financial skills.

### Box 6: The Sanitation Revolving Fund in Vietnam

A Sanitation Revolving Fund (SRF) component was incorporated in the broader Three Cities Sanitation Project in Vietnam to provide loans to low-income households for building on-site sanitation facilities. Working capital for the revolving funds was provided by the World Bank, DANIDA (Denmark) and FINNIDA (Finland) for three sub-projects in Danang City, Haiphong City and Quang Ninh Province (Halong City and Campha Town). The programme benefited almost 200,000 people over the course of seven years. The average hardware costs of the sanitation facilities built through the program was USD 197.

The SRF provided small loans (USD 145) over two years at partially subsidized rates to low-income and poor households to build a septic tank or, in fewer cases, a urine diverting/composting latrine or a sewer connection. The subsidized interest rate was equivalent to providing a USD 6 subsidy on each loan. The loans covered approximately 65% of the average costs of a septic tank and enabled the households to spread these costs over two years. The loans acted as a catalyst for household investment but households needed to find other sources of finance to cover total investment costs, such as borrowing from friends and family. Additional funding was provided by the project for software activities.

Trémolet et al. (forthcoming) found that these subsidies were highly effective at mobilising households' own investment; each dollar of public investment generated 20 dollars of investment from households. Targeting also appeared to be extremely good; all of the beneficiaries were found to be in the bottom income quintile. The programme was also highly sustainable – the funds have already been revolved several times and the scheme, which is now administered through Women's Unions, could continue operating until demand is exhausted.

of not interfering with the supply-side market for goods and services – in fact by stimulating demand it may also stimulate the development of a bigger market of small-scale providers of goods and services. MFIs may also be better than government at assessing whether households can afford the long-term costs of their investment. **Box 6** describes a programme with subsidized credit in Vietnam.



# Part 4:

## SMART FINANCING OF SANITATION SYSTEMS

In this section we turn from the discussion of sanitation programming overall to the examination of a typology of sanitation systems based on some generalised technological approaches. This is useful for focusing down onto practical guidance on the design of public finance for sanitation programmes in differing contexts. We discuss some financing options which apply the broad principles laid out in Part 1 of this primer to each of them.

### SANITATION SYSTEMS

In addition to adhering to the before mentioned principles for smart subsidy design, a key element in the design of smart sanitation financing arrangements is the type of sanitation system (or technology) that is being used.

Sanitation systems take numerous forms. The recent publication 'Compendium of Sanitation Systems and Technologies' from EAWAG/WSSCC by Tilley (2008) defines eight categories of sanitation systems and for a detailed discussion of these the reader is recommended to read this publication. While many systems vary technically the core technical considerations which impact on the design of finance systems are:

- ▶ Type of user interface/collection system (on-site versus off-site)
- ▶ Type of treatment for wastes (re-use/nutrient recycling versus disposal)
- ▶ Location of treatment (household, neighbourhood, centralized)

For the purpose of this publication we will therefore consider four broad categories of sanitation systems:

- ▶ **On-site systems with nutrient recycling in the home/neighbourhood:** generally referred to as ecological sanitation systems. The simplest form of ecological sanitation system is an arborloo, but more complex urine-diverting systems are also used in some places. In rural areas the recycled waste products can often be used directly by the household as an agricultural input while in more densely-settled areas products may be given away or sold to neighbours or local farmers.
- ▶ **Rural on-site systems with no nutrient recycling (pit latrines which may require emptying):** the most commonly-found group of latrines in rural areas, on-site systems vary from unimproved traditional latrines, through to improved forms such as the Ventilated

Improved Pit (VIP) latrines and Twin Pit Pour-Flush Latrines (TPPL). In single pit latrines, the pit must be emptied when it is full, which can be a hazardous job, or re-located, while in twin pit systems a full pit can be left for some time while the contents are processed before it requires emptying.

- ▶ **Urban on-site systems with no nutrient recycling (pit latrines and septic tanks which require emptying):** on-site latrines are also commonly constructed in urban areas where there is no sewerage network and are particularly common in peripheral urban growth areas. In urban areas where water is available, the pit is often replaced with a cesspit (a sealed pit) or occasionally a septic tank designed to provide partial treatment for the sludge. Twin pits are uncommon in densely settled areas, so single pits, cesspits and septic tanks are all required to be emptied and the hazardous septic sludge disposed of.
- ▶ **Off-site systems (latrines connected to sewerage networks) with decentralized or centralized treatment/disposal:** in a very small percentage of urban areas in developing countries, household toilets are connected to a sewerage network which is usually operated by a utility company or local government department. Households pay a connection charge and a surcharge (sometimes known as a 'cess') which is a partial levy on the water bill and supposed to cover the costs of operation of the sewerage network. Sometimes sewerage is connected to wastewater treatment facilities, but more commonly it discharges directly to the environment.

### LIFE COSTS OF SANITATION SYSTEMS

In Part 1 we laid out the cost elements of a sanitation programme. **Table 3** shows a preliminary assessment of whether each of these cost elements is likely to be comparatively high or low for our four types of sanitation

systems. This is based on what should be spent in order to maintain the sanitation facility in operation, rather than what is actually spent in practice: in many cases, operating expenses are kept artificially low and the facilities fall into disrepair only a few years down the line.

The remaining sections of this part of the primer consider the options for public financing of capital and operational costs of *household and community infrastructure and services* in our four types of sanitation systems.

**Table 3: Indicative Relative Costs of Different Sanitation Systems**

	SOFTWARE Hygiene behaviour change, sanitation marketing and enabling environment (Ongoing)	HARDWARE *		
		Household toilets (Capital Expenditure)	Sludge management facilities (Capital Expenditure)	Sludge management operations (Operational Expenditure)
<b>ON-SITE SYSTEMS WITH NUTRIENT RECYCLING</b>	<b>Medium-Very High</b> in most locations where re-use is not a cultural norm. Particularly high if urine-diversion is proposed.	<b>Very Low</b> (arborloo) - <b>High</b> (urine diverting/composting latrines): specialised slabs and raised superstructure may be required.	<b>Very Low</b> (arborloo) - <b>High</b> (special composting facilities and urine storage may be required).	<b>Low-Medium:</b> depending on location of re-use of products. Costs may be offset by income.
<b>OTHER RURAL ON-SITE SYSTEMS</b>	<b>Low-Medium:</b> Costs may be slightly lower than for systems with recycling but recent research suggests that high and sustained investment in ignition and support processes leads to greater sustainability.	<b>Low-Medium:</b> varies with design of latrine, water availability etc.	<b>Low-Medium:</b> increased costs where twin pits and larger pits are constructed.	<b>Low-Medium:</b> costs may be prohibitive if wrong technology choices are made. Opex costs may fall more heavily on least-able households.
<b>URBAN ON-SITE SYSTEMS</b>	<b>Low-Medium:</b> As for rural, better ignition and sustained support may result in greater sustainability. Some investment in enforcement may also be required.	<b>Medium-Very High:</b> varies with design of latrine, water availability and land prices.	<b>Medium-High:</b> suitable treatment and disposal options essential for an appropriate environmental and public-health outcome. Cost savings possible with low cost decentralized treatment.	<b>Medium-High:</b> varies with distance to treatment/disposal sites and technologies chosen. Costs of centralized tertiary treatment, if included, very high.
<b>URBAN OFF-SITE SYSTEMS</b>	<b>Low:</b> Costs may be relatively low and compliance not an issue if adequate services are provided.	<b>Low</b> (shallow sewers)- <b>High</b> (conventional sewers): in dense urban areas sewerage may be cheaper than on-site systems. Costs much higher for conventional sewerage than for shallow sewers.	<b>Medium-Very High:</b> cost savings possible with non-conventional designs (shallow sewers) and low cost decentralized treatment.	<b>Medium-Very High:</b> costs are higher when conventional rather than shallow sewerage networks are used. Energy costs very high if pumping required; costs of centralized tertiary treatment, if included, very high.

\* For simplicity we focus here on the hardware costs (capital/CAPEX and operational/OPEX) associated with the provision of services to households, including toilets and the management of faecal waste (sludge) or sewage. Public and institutional toilets are not included.

## FINANCING OPTIONS FOR EACH SANITATION SYSTEM

The main issues affecting the choice of financing mechanism for each of the four technical solutions are described below. For each technical solution a table (Tables 4-7 respectively) describes the various financing mechanisms available, ranging from self-financing to full subsidy; and the sources of the finances, ranging from purely private funds (user finance) to financing purely with public funds. The tables also show the main advantages and disadvantages or risks of each of the financing mechanisms in as much as can be inferred from the existing practice<sup>11</sup>. Examples of each of these financing mechanisms are provided in the right hand column.

### Issues for consideration in financing on-site systems with local recycling

(Refer to Table 4)

On-site systems designed for re-use of treated wastes have the advantage of generating a product which has economic value, either because it can be used directly as an agricultural input on a farm or kitchen garden or because it can be sold. The product(s) may comprise either separated urine and composted faeces or a mixture of both. For this reason it may be possible for households to recoup the cost of construction of the facility through a subsequent income stream although this is not always guaranteed if there is no market for the product and it cannot be used directly by the household. However the capital costs may be high, particularly where urine separation is included in the design. In this case, households may require access to financial services (savings or credit) or a subsidy to enable them to make the initial investment.

Furthermore the use of human waste as an agricultural input and the use of urine-separating latrine pans in particular are not the cultural norm in many countries. Additional software (promotion and marketing) inputs may be required to support the adoption and use of this type of facility and even then resale may not be possible. Such support may also be needed for a much longer period after construction to support the proper processing and safe use of the products. An additional cost may arise in the need for effective monitoring, and compliance mechanisms to ensure that human waste is used safely in agriculture.

A recent study commissioned by WSP showed the relatively high costs of on-site systems with recycling in urban areas of Africa and indicated that in the small set of cases examined, hardware subsidies were required to make the systems economically viable for households (Schuen and Parkinson, forthcoming).

### Issues for consideration in financing rural on-site systems

(Refer to Table 5)

In more traditional on-site systems the capital costs are often much lower. Many traditional sanitation programmes have focused on providing subsidized on-site latrines, with some of the effects already mentioned above. Subsidies are often justified as a way to stimulate demand – with a limited number of ‘targeted’ subsidies available to encourage early adopters to build latrines. Another popular approach is to provide a revolving fund which theoretically allows poorer households to ‘borrow’ funds to construct a latrine and pay the funds back over time – thereby enabling another household to benefit later. The major problems with these types of mechanisms seem to relate to targeting – it is often not the poorest and most disadvantaged that are able to make use of them. A second problem relates to the fact that they may skew technology choices, encouraging families to build more expensive latrines, or for example a pour-flush latrine with a concrete slab, even where water is scarce. This effect can be minimized if only particular essential elements are subsidized (the slab for example). Finally, many revolving funds seem to fail when early-adopters fail to pay back the money borrowed.

#### Box 7: Evidence of success of CLTS-type interventions

Proponents claim that the main advantage of the total sanitation approach over conventional policies is that it is a community-wide approach, which requires that every household in the community stops open defecation and uses a sanitary toilet. This approach involves even the poorest and most vulnerable households in the community, and ensures that the community and local government focus on helping these households gain access to a sanitary toilet with a safe excreta disposal system. The success of CLTS interventions worldwide is illustrated by the following:

- ▶ In Bangladesh, latest figures show that CLTS has spread to over 1,500 villages, a population of almost 2 million (Deak, 2008). Over 400 villages have reached ODF status.
- ▶ As part of a study in South Asia, Robinson (2005) found access to sanitation was high in all of the programmes using a ‘total sanitation approach’ and that toilet usage was measured as being over 70% in four of the seven projects studied.
- ▶ In Indonesia, Mukherjee (2008) reports that by using the CLTS approach 262 villages have become ODF in just eight months in one state alone.
- ▶ Harvey (2008) describes how by using a CLTS approach in an area of Zambia, 90,000 people in 517 villages have gained access to a toilet in just one year, with the coverage increasing from 0% to 100% in some villages in just one month!

WaterAid (forthcoming) find that CLTS-type interventions in Bangladesh, Nepal and Nigeria are highly cost-effective despite the challenges noted in achieving sustained removal of open defecation.

Table 4: Financing Options for On-site Systems with Nutrient Recycling in the Home/Neighbourhood

FINANCING MECHANISM	ADVANTAGES	RISKS	EXAMPLES
<b>FINANCING SOURCE: PURELY PRIVATE (USERS OF SERVICE)</b>			
<b>Self financing:</b> households invest in their own facilities and sell or use the recycled products.	<ul style="list-style-type: none"> <li>▶ Reflects demand</li> <li>▶ Maximum leveraging of household resources</li> <li>▶ Maximum leveraging of market-based sources (if available)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Risk of poor quality construction – particular health risks associated with handling poorly treated products</li> <li>▶ Suppliers/trained technicians may not be available</li> <li>▶ Unaffordable for poor and middle income groups</li> </ul>	Mexico and China each have examples of indigenous systems that are fully self-financed.
<b>FINANCING SOURCE: COMBINATION OF PRIVATE AND PUBLIC FUNDS</b>			
<b>Support for software with low/no subsidy for hardware.</b> Support can be delivered in form of: <ul style="list-style-type: none"> <li>▶ Hygiene promotion</li> <li>▶ Sanitation marketing</li> </ul>	<ul style="list-style-type: none"> <li>▶ Subsidy can be linked to outcome (achieving open defecation-free status)</li> <li>▶ Focuses public funds on public benefits (generating demand)</li> <li>▶ May result in some community-cross-subsidy</li> </ul>	<ul style="list-style-type: none"> <li>▶ The very poor may not be able to invest in certain types of infrastructure</li> <li>▶ May result in inappropriate toilets in households with no outlet for the recycled product</li> </ul>	
<b>Micro-finance to households</b> for sanitation or home improvements.	<ul style="list-style-type: none"> <li>▶ Can be used to finance high upfront costs which can be recouped later</li> </ul>	<ul style="list-style-type: none"> <li>▶ Demand may be low and require stimulation</li> </ul>	
<b>Loans to small-scale providers</b>	<ul style="list-style-type: none"> <li>▶ Lift constraint for SSIPs to enter the market</li> </ul>	<ul style="list-style-type: none"> <li>▶ Services may not reach the very poor</li> <li>▶ Demand may be very low</li> <li>▶ Providers unwilling to 'sell' unfamiliar technology</li> </ul>	
<b>Non-financial support to small-scale providers:</b> training, product development, business development services.	<ul style="list-style-type: none"> <li>▶ Boost private sector (supply side options) and can help to introduce new technology</li> </ul>	<ul style="list-style-type: none"> <li>▶ Service may not reach the very poor</li> <li>▶ Demand may still be low</li> </ul>	
<b>Output-based aid:</b> grants to households or communities or to SSIPs based on successful construction and use of facilities.	<ul style="list-style-type: none"> <li>▶ Subsidy linked to outputs – high levels of accountability</li> <li>▶ Focuses attention on proper re-use of the products</li> </ul>	<ul style="list-style-type: none"> <li>▶ Requires pre-financing which may not be available</li> <li>▶ Market financiers may be unwilling to pre-finance unfamiliar technology</li> </ul>	
<b>Community cross-subsidies:</b> users contribute to the most needy households in cash or kind.	<ul style="list-style-type: none"> <li>▶ Removes affordability constraint for the poorest</li> </ul>	<ul style="list-style-type: none"> <li>▶ May result in unsustainable service for poor and less-able households</li> </ul>	
<b>Partial infrastructure subsidy:</b> users contribute in cash or kind.	<ul style="list-style-type: none"> <li>▶ Enhances ownership of the facility</li> <li>▶ Improved affordability (removes access constraint)</li> </ul>	<ul style="list-style-type: none"> <li>▶ May result in unaffordable sanitation for the very poor</li> <li>▶ May result in inappropriate toilets in households with no outlet for the recycled product</li> </ul>	
<b>FINANCING SOURCE: PURELY PUBLIC FUNDS</b>			
<b>Full hardware subsidy</b>	<ul style="list-style-type: none"> <li>▶ Removes affordability constraint</li> <li>▶ Allows households to 'experiment' with new technology and test the market</li> </ul>	<ul style="list-style-type: none"> <li>▶ Can ignore or 'crowd out' households' own investment</li> <li>▶ Unequitable use of public funds if households have income stream from products</li> <li>▶ Facilities may not be used if they do not meet demand</li> </ul>	

Table 5: Financing Options for Rural On-site Systems with No Nutrient Recycling (pit latrines that may require emptying)

FINANCING MECHANISM	ADVANTAGES	RISKS	EXAMPLES
<b>FINANCING SOURCE: PURELY PRIVATE (USERS OF SERVICE)</b>			
<b>Self financing:</b> households invest in their own facilities.	<ul style="list-style-type: none"> <li>Majority of latrines are currently financed in this way</li> <li>Reflects demand</li> <li>Maximum leveraging of household resources</li> <li>Maximum leveraging of market-based sources (if available)</li> </ul>	<ul style="list-style-type: none"> <li>Poor quality construction</li> <li>Does not fully consider environmental impacts</li> <li>Suppliers may not be available/poor quality</li> <li>Unaffordable for the very poor</li> </ul>	Numerous, including India, Lesotho, Vietnam, Bangladesh, Pakistan, Burkina Faso, Benin
<b>FINANCING SOURCE: COMBINATION OF PRIVATE AND PUBLIC FUNDS</b>			
<b>Support for software with low/no subsidy for hardware.</b> Support can be delivered in form of: <ul style="list-style-type: none"> <li>Hygiene promotion</li> <li>Sanitation marketing</li> </ul>	<ul style="list-style-type: none"> <li>Subsidy can be linked to outcome (achieving open defecation-free status)</li> <li>Focuses public funds on public benefits (generating demand)</li> <li>Based at community level; can build community cohesiveness</li> </ul>	<ul style="list-style-type: none"> <li>May result in unaffordable sanitation for the very poor</li> <li>Sustainability is a risk once initial attention and support is withdrawn</li> </ul>	CLTS in Bangladesh, total sanitation in India, many other programmes of WaterAid, Plan, UNICEF etc.
<b>Micro-finance to households</b> for sanitation or home improvements.	<ul style="list-style-type: none"> <li>Can be used to finance upfront costs</li> </ul>	<ul style="list-style-type: none"> <li>Demand may be low and require stimulation</li> </ul>	Honduras
<b>Loans to small-scale providers</b>	<ul style="list-style-type: none"> <li>Lift constraint for SSIPs to enter the market</li> </ul>	<ul style="list-style-type: none"> <li>Services may not reach the very poor</li> <li>Demand may be very low</li> </ul>	Grameen Bank
<b>Non-financial support to small-scale providers:</b> training, product development, business development services.	<ul style="list-style-type: none"> <li>Boost private sector (supply side options)</li> </ul>	<ul style="list-style-type: none"> <li>Service may not reach the very poor</li> <li>Demand may still be low</li> </ul>	Bangladesh, Burkina Faso, Ghana, Peru, Senegal
<b>Output-based aid:</b> grants to households or communities or to SSIPs based on successful construction and use of facilities.	<ul style="list-style-type: none"> <li>Subsidy linked to outputs – high levels of accountability</li> </ul>	<ul style="list-style-type: none"> <li>Requires pre-financing which may not be available</li> </ul>	
<b>Community cross-subsidies:</b> users contribute to the most needy households in cash or kind.	<ul style="list-style-type: none"> <li>Removes affordability constraint for the poorest</li> </ul>	<ul style="list-style-type: none"> <li>May result in unsustainable service for poor and less-able households</li> </ul>	Numerous including many CLTS projects and programmes
<b>Partial infrastructure subsidy:</b> users contribute in cash or kind.	<ul style="list-style-type: none"> <li>Enhances ownership of the facility</li> <li>Improved affordability (removes access constraint)</li> </ul>	<ul style="list-style-type: none"> <li>May result in unaffordable sanitation for the very poor</li> </ul>	
<b>FINANCING SOURCE: PURELY PUBLIC FUNDS</b>			
<b>Full hardware subsidy</b>	<ul style="list-style-type: none"> <li>Removes affordability constraint</li> </ul>	<ul style="list-style-type: none"> <li>Can ignore or ‘crowd out’ households own investment</li> <li>Facilities may not be used if they do not meet demand</li> <li>Results in unsustainable technology choices</li> </ul>	Masibambane, South Africa

Community-managed social funds are another option – leaving the community to determine which households should benefit and to what extent. Informal cross-subsidies are also sometimes used – whereby more able households support the less able, usually with the provision of labour or materials rather than cash.

Recently there has been renewed interest in explicitly ‘subsidy-free’ approaches triggered by the success of the so-called Community-Led Total Sanitation (CLTS) approach, pioneered in Bangladesh. Earlier programmes which reduced or eliminated subsidies, such as the low cost sanitation programme in Lesotho in the 1980s had marked success but subsequently hardware subsidies have become more popular. CLTS focuses the entire community’s interest on the elimination of open defecation. Innovation is encouraged to enable even the poorest and least-able families to construct or access a basic latrine and use it. CLTS-type interventions shy away from subsidies (although most CLTS programmes do maintain some targeted subsidy elements or rewards) and focus on fostering and embedding a complete change in behaviour. The cost of software activities may thus be relatively high but hardware subsidies are

reduced or eliminated. While it is early days, the success rates of these types of approaches appear to be initially higher than more conventional subsidy-driven rural programmes (see **Box 7**). Questions remain however over the long-term sustainability and financing requirements of these programmes and further research and evaluation is ongoing. To address long-term impact, many programmes have added an output-based subsidy component, where communities get rewarded for achieving (or maintaining) ODF status.

A significant challenge for on-site systems arises several months or years after the initial programme when pits need to be emptied or latrines moved. The use of subsidies to ‘speed up’ latrine adoption may result in too little attention being paid to long-term management plans. In some cases this results in latrines falling out of use once they are full or being damaged or broken in the process of being emptied. Even with CLTS-type interventions, preliminary evidence suggests that follow up support is still needed to help communities manage and evolve their sanitation systems over time.

### Issues for consideration in financing urban on-site systems

(Refer to Table 6)

On-site latrines in urban areas attract many of the same subsidies as they do in rural areas. The critical additional factor in urban areas is the need for sustained long-term sludge management. Urban latrines may have smaller pits and may also fill quicker than their rural equivalents due to high rates of usage, high water tables, misuse and disposal of solid waste in latrines, etc. They also often need to be managed and emptied more regularly because of the risk of contamination of local shallow water supplies. In congested areas however, sludge management may be very challenging.

For this reason the use of subsidies to encourage construction of urban on-site systems must be undertaken with care, and embedded in a strategy for longer-term management of faecal sludge (**Box 8**). Subsidies for sludge management could be directed at households (in the form of vouchers to pay for sludge emptying services) or at suppliers (who can then offer cheaper services to households). To encourage proper disposal of sludge in appropriate locations, local authorities may also consider paying sludge emptiers on a volumetric basis for sludge delivered to appropriate transfer stations and disposal points.

Local authority investments in collection and treatment services is also an important element of such a system and since its benefits are entirely public can justifiably be funded at least in part from public funds – at the least the public sector has a duty to ensure that this is done. Public funds may also be used to enforce certain minimum

#### Box 8: Single pit latrines in urban South Africa

South Africa’s commitment to improving sanitation over the past decade has been an inspiration and a stimulus to many country programmes. The impacts of a strong rights-based policy approach, high-level political support and substantial funding are evident in the provision of fully-funded toilets to over three million households since the mid-1990s, and an improvement in sanitation coverage from 48% to 71%.

However, South Africa’s programme has become increasingly infrastructure-focused and as pressure has mounted to meet output-driven targets, the approach has become increasingly rigid and inflexible. A growing number of VIP toilet pits are filling up and becoming unusable, and there is increasing concern that the benefits of this substantial investment will be lost unless there is a massive correction soon.

Following the national sanitation policy drafted in 1994, responsibility for water supply and sanitation has been decentralized to local government. For water, this has meant that the planning, management, operation and maintenance functions of water committees has been taken over by municipalities; but for on-site sanitation, the implications are less clear. Critically, government has not clarified the roles and responsibilities of users and municipalities around VIP maintenance. Most municipalities do not know how to respond to full pits, and users don’t see this as their responsibility; many users are now reverting to unimproved toilets or open defecation, with little net gain in health and hygiene behaviour. What is clear, though, is that the VIP toilets being built are grossly inappropriate for municipal servicing: many pits are small and sealed, the top-structures are not movable, and few facilitate access for pit desludging.

Source: Eales and Potter (2008).

Table 6: Financing Options for Urban On-site Systems with No Nutrient Recycling (pit latrines that may require emptying)

FINANCING MECHANISM	ADVANTAGES	RISKS	EXAMPLES
<b>FINANCING SOURCE: PURELY PRIVATE (USERS OF SERVICE)</b>			
<b>Self financing:</b> households invest in their own facilities.	<ul style="list-style-type: none"> <li>Reflects demand</li> <li>Maximum leveraging of household resources</li> <li>Maximum leveraging of market-based sources (if available)</li> </ul>	<ul style="list-style-type: none"> <li>Poor quality construction</li> <li>No attention to long-term faecal sludge management</li> <li>Suppliers may not be available/poor quality</li> <li>Unaffordable for the very poor</li> </ul>	Numerous
<b>FINANCING SOURCE: COMBINATION OF PRIVATE AND PUBLIC FUNDS</b>			
<b>Support for software with low/no subsidy for hardware.</b> Support can be delivered in form of: <ul style="list-style-type: none"> <li>Hygiene promotion</li> <li>Sanitation marketing</li> </ul>	<ul style="list-style-type: none"> <li>Subsidy can be linked to outcome (achieving open defecation-free status)</li> <li>Focuses public funds on public benefits (generating demand)</li> </ul>	<ul style="list-style-type: none"> <li>May result in unaffordable sanitation for the very poor</li> <li>Sustainability is a risk unless city is making linked investments in sludge management</li> </ul>	Orangi Pilot project in Karachi and many others in Pakistan. Social Intermediation Project in Dhaka
<b>Micro-finance to households</b> for sanitation or home improvements.	<ul style="list-style-type: none"> <li>Can be used to finance upfront costs</li> </ul>	<ul style="list-style-type: none"> <li>Demand may be low and require stimulation</li> <li>Households may not have access to sludge management services</li> </ul>	Parivartan project, Gujarat India
<b>Loans to small-scale providers</b>	<ul style="list-style-type: none"> <li>Lift constraint for SSIPs to enter the market</li> <li>Can be targeted at sludge management operations to encourage long-term sustainability</li> </ul>	<ul style="list-style-type: none"> <li>Services may not reach the very poor</li> <li>Demand may be very low</li> </ul>	Orangi Pilot project with loans to family businesses
<b>Non-financial support to small-scale providers:</b> training, product development, business development services.	<ul style="list-style-type: none"> <li>Boost private sector (supply side options)</li> <li>Can be targeted at sludge management operations to encourage long-term sustainability</li> </ul>	<ul style="list-style-type: none"> <li>Service may not reach the very poor</li> <li>Demand may still be low</li> </ul>	
<b>Cross-subsidies:</b> sanitation surcharge from the water bill.	<ul style="list-style-type: none"> <li>Use of a sustainable cross-subsidy</li> <li>Targets the least-served communities</li> </ul>	<ul style="list-style-type: none"> <li>Funds availability is constrained by political willingness to raise the water bill</li> </ul>	Burkina Faso subsidy for hardware (25%) and training for masons
<b>Output-based aid:</b> grants to SSIPs based on successful construction and use of facilities.	<ul style="list-style-type: none"> <li>Subsidy linked to outputs – high levels of accountability</li> </ul>	<ul style="list-style-type: none"> <li>Requires pre-financing which may not be available</li> </ul>	SSIPs for onsite sanitation in Dakar Senegal
<b>Partial infrastructure subsidy:</b> users contribute in cash or kind.	<ul style="list-style-type: none"> <li>Enhances ownership of the facility</li> <li>Improved affordability (removes access constraint)</li> </ul>	<ul style="list-style-type: none"> <li>May result in unaffordable sanitation for the very poor</li> <li>No access to sludge management services resulting in unsustainable system</li> </ul>	
<b>FINANCING SOURCE: PURELY PUBLIC FUNDS</b>			
<b>Full hardware subsidy</b>	<ul style="list-style-type: none"> <li>Removes affordability constraint</li> </ul>	<ul style="list-style-type: none"> <li>Can ignore or ‘crowd out’ households own investment</li> <li>Facilities may not be used if they do not meet demand</li> <li>Results in unsustainable technology choices</li> </ul>	Masibambane, South Africa

**Table 7: Financing Options for Off-site Systems (latrines connected to sewerage networks) with decentralized or centralized treatment/disposal**

FINANCING MECHANISM	ADVANTAGES	RISKS	EXAMPLES
<b>FINANCING SOURCE: PURELY PRIVATE (USERS OF SERVICE)</b>			
<b>Self financing:</b> households invest in their own facilities.	<ul style="list-style-type: none"> <li>▶ Reflects demand</li> <li>▶ Maximum leveraging of household resources</li> <li>▶ Maximum leveraging of market-based sources (if available)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Poor quality construction and bad system planning</li> <li>▶ Unaffordable for the very poor</li> <li>▶ Only an option if networked sewers are available close to the household</li> </ul>	Numerous including Orangi Pilot Project, Pakistan, Malang, Indonesia
<b>FINANCING SOURCE: COMBINATION OF PRIVATE AND PUBLIC FUNDS</b>			
<b>Support for software with low/no subsidy for hardware.</b> Support can be delivered in form of: <ul style="list-style-type: none"> <li>▶ Hygiene promotion</li> <li>▶ Sanitation marketing</li> </ul>	<ul style="list-style-type: none"> <li>▶ Subsidy can be linked to outcome (achieving open defecation-free status)</li> <li>▶ Focuses public funds on public benefits (generating demand)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Will have limited or no impact unless working sanitation system is available</li> </ul>	Public promotion campaigns in many utility companies
<b>Micro-finance to households</b> for sanitation or home improvements.	<ul style="list-style-type: none"> <li>▶ Can be used to finance upfront costs</li> </ul>	<ul style="list-style-type: none"> <li>▶ Demand may be low and require stimulation</li> <li>▶ Households may not have access to sludge management services</li> <li>▶ Will have limited or no impact unless working sanitation system is available</li> </ul>	Parivartan programme in Ahmedabad, India
<b>Loans to small-scale providers</b>	<ul style="list-style-type: none"> <li>▶ Can encourage service expansion into unserved areas</li> </ul>	<ul style="list-style-type: none"> <li>▶ Services may not reach the very poor</li> <li>▶ Most utility companies do not encourage working with third-party providers</li> <li>▶ Lack of regulatory capacity means management is challenging</li> </ul>	
<b>Non-financial support to small-scale providers:</b> training, product development, business development services.	<ul style="list-style-type: none"> <li>▶ Boost private sector (supply side options)</li> <li>▶ Encourages service expansion with little burden on public finances</li> </ul>	<ul style="list-style-type: none"> <li>▶ Service may not reach the very poor</li> </ul>	Malang, Indonesia
<b>Cross-subsidies:</b> connection charges paid for from general revenue of the utility company.	<ul style="list-style-type: none"> <li>▶ Use of a sustainable cross-subsidy</li> <li>▶ Targets the least-served households</li> </ul>	<ul style="list-style-type: none"> <li>▶ Funds availability is constrained by political willingness to raise the water bill</li> <li>▶ Utilities may be unwilling to 'give up' source of income</li> </ul>	Burkina Faso, Senegal
<b>Output-based aid:</b> grants to utilities or SSIPs based on successful construction and operation of local networks.	<ul style="list-style-type: none"> <li>▶ Subsidy linked to outputs – high levels of accountability</li> </ul>	<ul style="list-style-type: none"> <li>▶ Requires pre-financing which may not be available</li> </ul>	Limited experience to date but proposals exist for Gharbeya, Egypt and Colombo, Sri Lanka
<b>FINANCING SOURCE: PURELY PUBLIC FUNDS</b>			
<b>Full hardware subsidy</b>	<ul style="list-style-type: none"> <li>▶ Removes affordability constraint</li> </ul>	<ul style="list-style-type: none"> <li>▶ Rarely sustainable in the long run and results in severe underinvestment in the system</li> </ul>	Many in industrialized and developing cities



construction standards if this is appropriate, and to penalize improper disposal of faecal sludge.

Several options exist for financing the public-elements of this type of urban system. Funds can be generated in the form of a cess on the water bill for households with a sewerage connection, or can be raised from local taxes.

### Issues for consideration in financing off-site systems

(Refer to Table 7)

Off-site systems, usually comprising a house connection to a conventional or small-bore sewer network, are usually seen as a public good and financed from general revenue, or in a few cases by debt raised and serviced from the income of the operating utility company. The cost of connecting to the network, along with the cost of in-house plumbing, is generally expected to be financed by the land developer or property owner.

There are two major problems with this model:

Firstly the high cost of a connection often means that poor and unserved households are unable to access the publicly financed networked service. Options to subsidize or spread this cost exist. The simplest mechanism is to amortise the cost through several monthly payments attached to the water bill or across the entire finances of the utility company. Both of these options remove a key access barrier. The latter has the advantage of being quite progressive – enabling already-served households to cross-subsidize newer and unserved households which are likely to be poorer.

The second problem is that in general coverage of networked sanitation is very low - very few people therefore benefit from the public subsidy which constructs and operates the public system. Furthermore the high levels of expenditure may prevent other public investments which would have a wider benefit (such as in extending the network and providing proper transfer stations close to areas using on-site systems).

Small bore sewers (often but not always condominial sewers) are cheaper to construct and operate and may remove some of the financial constraints – enabling a much greater expansion of networked services (**Box 9**). Condominials can also be provided in decentralized networks with lower operational costs. However such community systems are often expected to be financed by the community alone – which once again gives rise to equity concerns if the conventional networked is highly subsidized.

#### Box 9: Costs and benefits of condominial sewers in El Alto Bolivia

The El Alto Pilot Project in Bolivia was started in 1998 and provided sewerage connections to 4,050 households in nine neighbourhoods of El Alto. The project combined a number of innovative components designed to reduce the costs and maximize the benefits of water and sewerage connections to poor households.

The innovations adopted in the project made it possible to reduce the costs of sewerage connections by 40%. About half of these savings were attributable to a condominial design (savings in the length and diameter of pipes and 75% savings in the volume of soil excavation as a result of shallower trenches), and the other half to the use of community volunteer labour to build the networks. A higher percentage of households were connected to newly installed sewerage networks at project sites (75%) compared with a control neighbourhood (66%) using conventional sewerage. Households receiving hygiene education were twice as likely to install a bathroom in their homes as those that did not; a proportion of 70% as opposed to 35%. Moreover, they increased their water consumption by 30% for hygiene related activities. In broader terms, the experience demonstrates that with a combination of technological innovation and human capacity building it is possible to make piped sewerage services both more affordable and more beneficial to poor households.

Source: Foster (2001).

# Part 5:

## PRINCIPLES FOR IMPROVING THE DESIGN OF SUBSIDIES

### WHAT HAS BEEN LEARNED<sup>12</sup>

Reviewing the impact of current approaches, the overriding impression is not that public subsidies fail *per se* but that they fail when they are associated with supply-driven approaches which fail to take account of household preferences and behaviour or where they focus too much on hardware and there is insufficient funding available for the essential 'software' elements of the sanitation programme. The design of smart subsidies is a challenging task and it requires close attention to the specifics of every case.

### GOING TO SCALE: SUBSIDIES AS A LEVERAGING TOOL

In the past, reliance on household hardware subsidies and subsidized sewerage has tended to 'crowd out' two important additional sources of finance – the household itself, and the market. This outlook is now beginning to change and there is increasing recognition of the possibility of greater household and community resources being mobilized through full or partial cost sharing and technical innovation as part of a well designed overall financial strategy.

In other words, public subsidies could be used to leverage much greater investment if they are used explicitly in support of other sources of funds for more appropriate goods and services. This approach, widely recognized in the literature on both sanitation marketing and Community-Led Total Sanitation, suggests greater emphasis on financing sanitation promotion and the enabling environment (software), with limited but smarter subsidies for hardware where required. Mehta and Knapp (2004) show the potential benefits of improved subsidy design in terms of the additional funding that could be leveraged (see **Figure 2**).

Increased leveraging requires a shift in funding away from direct or infrastructure subsidies to alternatives such as subsidized credit, support for small-scale providers, and better, smarter funding for public elements of the sanitation system. In an environment of scarce resources, public funds go further if they are targeted in ways that encourage investments from other sources (for example, funding for wastewater treatment facilities can be associated with contracting arrangements that encourage cost efficiency and responsible user charges from utility service providers). Leveraging requires an understanding of what households themselves are willing and able to invest. It can potentially unleash new sources of funds and at the same time empower communities and households to take control of their own development. It can also free up scarce public funds to be spent on essentials such as salaries and travel costs for health extensionists working in the remotest areas. Rather than being anti-poor such a shift in emphasis can enable a significant step change in access for the most excluded groups.

### SUBSIDIES AS A DEVICE TO ACHIEVE EQUITY

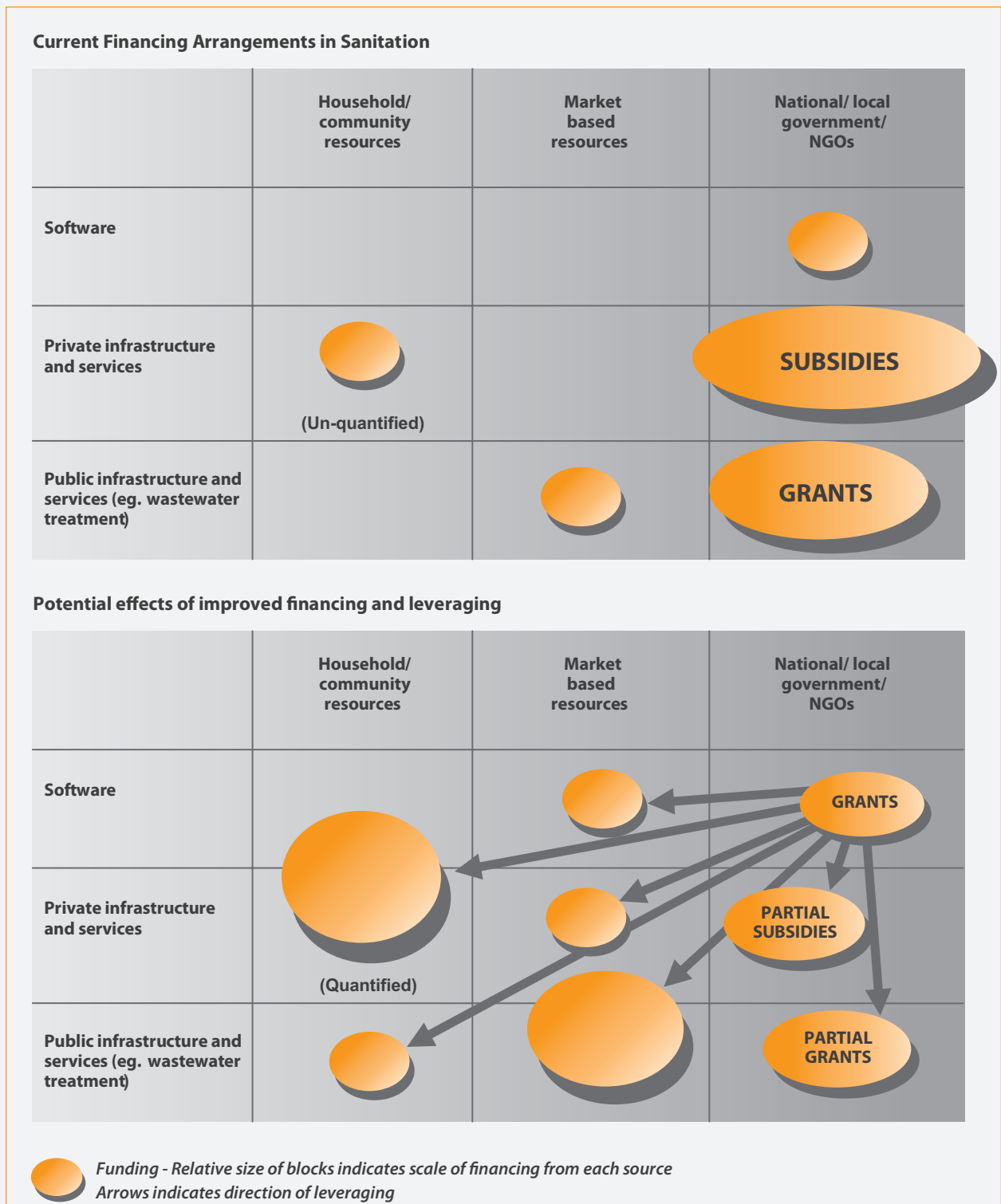
Subsidies can be used to remove inequities but this may not always mean that the subsidy must be delivered in the form of a free service to the most needy households. To start with: identifying the most needy households remains a challenge and funds are limited. **There may not be enough money to provide free services to everyone who needs them.** A more pragmatic approach in some cases would be to focus on getting everyone to make the first small steps towards improved hygiene. Where coverage is very low this type of approach shows great promise. CLTS has been highly effective in some countries in getting a significant number of people to take these first steps. In other situations, more elaborate interventions may still be needed – to increase the range of goods and services on offer for example, or to bring down the costs of safe disposal of faecal sludge.

## A FLEXIBLE INFORMATION-BASED APPROACH

In the final analysis there is no single 'right' answer to the design of financing arrangements for sanitation. Objectives vary with national priorities, with geography, with social conditions and health conditions and over

time. The argument put forward here is that the design of financing arrangements (including subsidies in all their forms) should be based on sound empirical evidence and clear policy objectives. Investing in this type of informed policy debate up front may result in a much more efficient use of scarce public funds and ultimately, better access to sanitation for all.

Figure 2: Moving from hardware subsidies to promotion and leveraging



# GLOSSARY

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<b>Amortising</b>	A financial arrangement whereby a payment for a service or repayment of a debt is spread over a series of payments. Interest may be added in some cases.
<b>Community-Led Total Sanitation</b>	An approach used in rural areas that ignites a process of behaviour change across the entire community to eliminate the practice of open defecation.
<b>Condominial sewers</b>	A small-bore shallow sewer usually laid in the back garden or lane of a group of houses with significantly lower capital and operating costs when compared with conventional sewers.
<b>Consumption subsidy</b>	A subsidy delivered to the consumers of a service having the effect of reducing the price of that service below its cost of production.
<b>Crowding out</b>	The effect of reducing financial flows from one or more sectors (typically private and market sources) because of financing from another sector (typically the public sector).
<b>Direct subsidy</b>	A subsidy paid to the household or individual which in the form of cash, tax breaks or vouchers which can then be used either to pay for anything or for a specified set of goods and services.
<b>Enabling environment</b>	The policies, laws, organisations, people and skills required to deliver a sanitation program.
<b>Environmental sanitation</b>	The management of human excreta, greywater, sullage water, stormwater drainage, solid waste and industrial and agricultural waste products.
<b>Externality</b>	An effect felt in the wider community as a result of an individual or community action.
<b>Faecal Sludge Management</b>	The management of faecal sludge from latrine pits, septic tanks and cess pits, including its removal, carriage, treatment and disposal.
<b>Hygiene behaviour change</b>	The process of changing core behaviours, usually handwashing and relating hygiene activities.
<b>IEC</b>	Information, Education, Communication – the name often given to the materials and media activities that are used in hygiene promotion programmes.
<b>Infrastructure subsidy</b>	A subsidy which pays for specific infrastructure to be constructed, usually household latrines or urban sewerage and wastewater treatment.

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<b>Leveraging</b>	The effect of using one source of funds (typically public money) to increase funding from another sector (typically private or market sources).
<b>Merit good</b>	Something with a perceived value to society higher than the value placed on it by individuals.
<b>Operating subsidy</b>	A subsidy delivered to cover the operating costs of a department or utility.
<b>ODA</b>	Official Development Assistance – funds flowing to governments from bilateral and multilateral sources.
<b>Output-based subsidy</b>	A subsidy delivered ex poste on delivery of an agreed output (usually a working service).
<b>Perverse Incentive</b>	An incentive (encouragement) to act in a way that does not contribute to agreed goals.
<b>Public good</b>	A good or service whose benefits can be enjoyed by an individual without reducing their utility to other individuals and from whose benefits individuals cannot be excluded.
<b>Sanitation</b>	The collection, transport, treatment and disposal or reuse of human excreta, domestic wastewater and solid waste, and associated hygiene promotion.
<b>Sanitation marketing</b>	The process of analyzing the supply and demand for sanitation and a set of interventions designed to improve either or both.
<b>Sanitation programme</b>	The institutions, organisations, arrangements, funding, staffing and financing required to deliver sanitation in its broadest sense, including the enabling environment, hygiene behaviour change, sanitation marketing, public infrastructure and services, and private infrastructure and services.
<b>Sanitation system</b>	The technical infrastructure required to achieve collection, transport, treatment, disposal or re-use of waste.
<b>Small bore sewers</b>	See condominal sewers.
<b>Software</b>	The set of activities relating to improving sanitation which do not comprise the construction and use of infrastructure. Generally software includes the enabling environment, hygiene behaviour change and sanitation marketing.
<b>Twin-pit Pour-flush latrine (TPPL)</b>	A latrine having a water seal and two unsealed pits which can be used alternately such that waste in one pit decomposes before it is required to be emptied and re-used.
<b>Utility company/provider</b>	A company which may be privately- or publicly-owned having responsibility to deliver utility services, in this case usually water and/or sewerage and/or other sanitation services.
<b>Ventilated Improved Pit Latrine (VIP)</b>	A latrine which reduces fly and odour nuisance through use of a darkened superstructure or pit cover to prevent light entering the pit, and a screened vent pipe to remove odours and prevent fly-maggots from emerging.

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## ENDNOTES

1. Full coverage of networked, waterborne sewerage took many years to achieve; some British cities for example only reached this milestone in the middle of the twentieth century. Meanwhile many households continued to use dry privies, or shared facilities.
2. Text modified from Economics by Begg et al. (1984)
3. *ibid.*
4. *ibid.*
5. *ibid.*
6. *ibid.*
7. Lazslo Somlyody, past president IWA – personal communication, June 2007
8. For readers familiar with the Orangi Pilot Project, this approach is a development of OPP's thinking on how to link the public management of external (trunk) services with the community-management of internal (local) services.
9. The "community animators" were transferred to municipalities but effectively stopped promoting sanitation, which resulted in decreased interest in the product. Responsibility for paying production subsidies was transferred to Provincial governments. Some Provinces stopped giving the subsidies and others kept their level unchanged since 2000 whilst production costs have increased significantly. As a result, the workshops have had to carry out other income-generating activities in order to cross-subsidize slab and latrine production costs.
10. Even in the UK for example, Franceys (2008) comments that current policies of the regulator OFWAT mean that the theoretical replacement period for sewerage infrastructure is around 300 years – the deferral of essential replacements acting as a subsidy to consumers.
11. An ongoing study by WSP aims to explore these risks more thoroughly
12. Portions of this text developed from Evans, 2006



# PUBLIC FUNDING FOR SANITATION: THE MANY FACES OF SANITATION SUBSIDIES

Access to safe sanitation would, for some 2.5 billion fellow citizens without it, improve their health, dignity, local environment and economic well-being. While most people would agree that the poor and vulnerable should be supported to obtain sanitation services in ways that promote social equity, are people-centred, participatory and affordable, the debate on how to do it often becomes contentious. Some people propose infrastructure-based hardware subsidies; others oppose them. As Public Funding for Sanitation explains, the discussion on appropriate sanitation financing mechanisms for the poor goes far beyond the use of hardware subsidies. It must take into account aspects of hardware and software, capital and operational expenditure, the type of sanitation system being built, and, ultimately, the users of the sanitation system. This primer assists the reader in understanding the global debate on subsidies and sanitation financing, and provides guidance on how to select the most appropriate funding arrangements for sanitation programming in different situations.

## **WATER SUPPLY & SANITATION** COLLABORATIVE COUNCIL

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