

WSP Sanitation Global Practice Team

Financing On-Site Sanitation for the Poor A Six Country Comparative Review and Analysis

Sophie Trémolet with Pete Kolsky and Eddy Perez

January 2010

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Acknowledgments

By Sophie Trémolet with Pete Kolsky and Eddy Perez

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Foreword

Promotion of household investment in sanitation is a cost-effective public health intervention, in terms of the ratio of public cost to estimated health benefits.¹ Good sanitation confers on its users other important benefits: dignity, privacy, and time savings. For these reasons, the World Summit on Sustainable Development in 2002 included sanitation as part of the Millennium Development Goals (MDGs). Target 10 of Goal 7 includes a commitment to halve the fraction of the world's population without access to improved sanitation relative to that in 1990.

Progress towards the sanitation target has been uneven. While some countries, including Bangladesh and Vietnam, are well positioned to meet the target, others, such as India and most countries in Sub-Saharan Africa, are unlikely to do so by 2015. Despite the benefits, sanitation specialists have been unable to mobilize sufficient funding, attention, and political will at the local, national, and global levels to achieve the sanitation target. Even where investments are made, they are often relatively ineffective or do not reach the rural and urban poor who have the least access to sanitation and are thus most at risk. The financial crisis and its associated impact on the global economy are putting governments' budgets under stress, in developed and developing countries alike.

Three crucial questions in all development activities financed by the World Bank are "How much will it cost?" "How will it be paid for?" and "Who pays what?" To help answer these questions, the World Bank undertook a study of utility subsidies in water supply and electricity.² Although sanitation was supposed to be included, the authors quickly found an almost complete lack of data on the topic. As a result, the Water and Sanitation Program (WSP) and the Water Anchor of the World Bank have collaborated in managing this study as a first step to painting a full picture of finance and costs in sanitation.

The present study offers evidence on alternative financing approaches for on-site household sanitation from case studies in six countries: Bangladesh, Ecuador, India, Mozambique, Senegal, and Vietnam. This evidence can help identify the best-performing approaches and the relevant factors and issues to consider in designing a sanitation financing strategy. The study systematically compares alternative financing approaches based on a set of common indicators, including in terms of the effectiveness in the use of public funds and targeting. The team chose to focus on those projects recognized as successes to obtain a reasonable representation of the better practices in sanitation programs. The study identified a number of useful examples and tentative lessons about finance which should help to advance the design of sanitation finance at the outset of a project. Replicating such experiences will require a better understanding of what drives household investment and what the key constraints limiting such investment are, in both financial and non-financial terms.

The sanitation challenge continues to grow with population, as does the cost of failing to meet it. We believe this study is a worthwhile contribution to addressing the challenge of how to pay for sanitation.

1 Jamison et al. 2006.
2 Komives et al. 2005.

Executive summary

1 The problem: Sanitation, economics, and finance

Forty percent of the world's people do not have access to a basic level of sanitation; one in five of us practices open defecation.³ This crisis in sanitation has clear consequences. Diarrhea kills over 1.5 million children each year, and 88 percent of these deaths are attributed to fecal contamination from inadequate sanitation, hygiene, and water supply.⁴ The lack of sanitation spreads many other diseases, pollutes both water and land, and robs the poor of basic dignity. The cost of these problems is high in economic as well as human terms. In a series of studies, the Water and Sanitation Program (WSP) estimated that inadequate sanitation costs the economies of four Southeast Asian countries the equivalent of approximately 2 percent of their GDP⁵; these results echo similar findings elsewhere about both the costs and benefits of sanitation.⁶ Given this human and economic toll, why is progress still so slow?

Sanitation solutions are not cheap for the poor, who make up the vast majority of those without sanitation. In the six countries described in this study, the capital cost of household sanitation varied between US\$17 and US\$568, costs which often exceeded half the annual household income of the poor in the respective project areas. Like housing, on-site sanitation is often viewed as a private good and the basic responsibility of the beneficiaries themselves. Yet sector professionals have long argued that some public finance of sanitation can be justified by its inherent externalities; construction and use of a family latrine protects others at least as much as it reduces disease transmission within the family. However, the large number of poor households without sanitation makes it difficult for strained government budgets to contribute a

large fraction of the cost. In addition, economists and sector professionals are generally skeptical of subsidy schemes, having seen how inefficient and counter-productive some poorly designed programs can be.

The challenges of finance – the practical decisions about who pays how much for what, when, and how – thus lie at the heart of the world's efforts to promote health, dignity, and a cleaner environment through sanitation. Yet despite the importance of the topic, past efforts to gather meaningful data on sanitation finance have largely failed. A landmark report on subsidies in water and power⁷ was originally intended to include sanitation but could not do so because of the lack of readily available data. At the start of this study, few if any credible data were available to describe the numbers and experience of sanitation finance.

2 Objectives and some key questions of this study

This study aims to improve understanding of the finance of on-site household sanitation through careful analysis of practical field experience in a wide range of projects. The Sanitation and Hygiene Global Practice Team of the World Bank Water and Sanitation Program (WSP) initially conceptualized this study to offer better guidance to sector professionals developing on-site sanitation projects and programs.

Most of those without sanitation live in rural areas or on the fringes of cities beyond the reach of sewerage networks. The first step up “the sanitation ladder” for those without access will be on-site sanitation. The institutional and financial structures of sewerage and on-site sanitation are so different that it was decided to focus this first study on the issue of basic on-site sanitation.

3 UNICEF/WHO JMP 2008.

4 Lopez et al. 2006.

5 Hutton et al. 2007.

6 Hutton and Haller 2004. Additional background information is derived from roughly 30 country reports, both published and unpublished, completed between 2004 and 2007 and made available to the authors by Bjorn Larsen.

7 Komives et al. 2005.

The study addresses such basic questions as:

- How much does provision of access to on-site sanitation cost, that is, once all costs (hardware and software) are taken into account?
- Do the type and scale of sanitation subsidy affect provision and uptake? How?
- How can the public sector most effectively support household investment in on-site sanitation?
- Should it be via investment in demand stimulation, subsidies to households or suppliers, by support to credit schemes, or by other means?
- Should hardware subsidies be provided or should public spending be focused on promoting demand or supporting the supply side of the market? Where hardware subsidies are adopted, what is the best way to ensure that they reach their intended recipients and are sustainable and scalable?
- What innovative mechanisms (such as credit or revolving funds) can be used to promote household sanitation financing?

3 The approach of the study

This study reviews on-site sanitation financing in six carefully selected case studies by examining:

- The financing sources (who pays) and
- The financing approaches:
 - What share is paid by each source, and how?
 - What public funding mechanisms are used, including hardware subsidies, software support, or facilitated access to credit?

In addition to summarizing the mechanics of each approach, all case studies were reviewed in terms of common evaluation criteria:

- *Impact on sustainable access to services:* Did the project contribute to increasing access to sanitation?

- *Costs:* Are the costs of the resulting sanitation facilities reasonable and affordable to the beneficiaries?
- *Effectiveness in the use of public funds:* Were public funds used in a way that maximized impact?
- *Poverty targeting:* Did the program seek to target the poor and was the program effective at doing so?
- *Financial sustainability:* Could the financial approach be sustained over time without external support?
- *Scalability:* Could the financial approach be scaled up to cover those who are not yet covered in the country at a reasonable cost?

The case studies were selected to reflect a range of household sanitation financing approaches and contexts; the chosen projects were located in Bangladesh, Ecuador, Maharashtra (India), Mozambique, Senegal and Vietnam.

These projects and their financing approaches are presented below in Table A in the increasing percentage of the total costs of sanitation adoption coming from public funds. At one end of the public finance spectrum, some projects (such as in Bangladesh and India) only offered subsidies for software activities and for limited and targeted hardware subsidies for poor households. Limited amounts of public funding were also used for the Sanitation Revolving Fund in Vietnam, an innovative approach to using microfinance for increased access to sanitation that yielded very high leverage of user contributions. At the other end of the spectrum, projects in Sénégal and Ecuador adopted a relatively high hardware subsidy.

Table A presents a summary of the evaluation based on the six criteria described above.

TABLE A. CASE STUDIES OF HOUSEHOLD SANITATION AND FINANCING APPROACHES

Project context level of service, population that adopted sanitation during the project, study period	Financing approach
Vietnam Sanitation Revolving Fund (SRF) - urban areas • Mostly bathrooms and septic tanks • 194,000 people • 2001 to 2008	<ul style="list-style-type: none"> • Software support for sanitation promotion and hygiene education • Facilitated access to credit via sanitation revolving funds • Subsidized interest rates on loans for hardware construction (accounting for about 3% of hardware costs) • Public funds = 7% of total costs of sanitation adoption
Maharashtra (India) Total Sanitation Campaign (TSC) using CLTS approaches -rural areas • Improved latrines • 21,200,000 people • July 2000 to November 2008	<ul style="list-style-type: none"> • Software support for community mobilization, including outcome-based financial rewards to villages reaching Open Defecation Free (ODF) status to be spent on sanitation investments • Outcome-based hardware subsidies for below-poverty-line households (covering about 22% of hardware costs for beneficiaries) • Access to credit in some districts only • Public funds = 9% of total costs of sanitation adoption
Bangladesh DISHARI (based on Community Led Total Sanitation) - rural areas • Basic latrines • 1,631,000 people • 2004 to 2008	<ul style="list-style-type: none"> • Software support for community mobilization, sanitation promotion, and local government strengthening, including outcome-based financial rewards to villages that are 100% sanitized. Rewards come with no strings attached and do not necessarily need to be spent on sanitation. • Up-front in-kind hardware subsidies targeted to the poorest (covering about 42% of hardware costs for beneficiaries) • Public funds = 31% of total costs of sanitation adoption
Mozambique Improved Latrines Program (PLM) - urban areas • Improved latrines • 1,888,000 people • 1980 to 2007	<ul style="list-style-type: none"> • Software support for sanitation promotion and establishment of local workshops building slabs and latrines • Output-based subsidies to local sanitation providers for each slab or latrine sold (intended to cover 40% to 60% of hardware costs) • Public funds = 58 % of total costs of sanitation adoption (estimated)
Ecuador PRAGUAS - rural areas • Sanitation units (toilet, septic tank, sink, shower) • 143,000 people • 2001 to 2006	<ul style="list-style-type: none"> • Software support to strengthen municipalities to work in sanitation, for technical designs and monitoring • Up-front fixed hardware subsidies (covering about 60% of hardware costs) provided to communities • Public funds = 85% of total costs of sanitation adoption
Senegal PAQPUD - urban areas • Range of options: improved latrines to septic tanks • 411,000 people • 2002 to 2005 (not including extensions via GPOBA)	<ul style="list-style-type: none"> • Software support for sanitation promotion, including hygiene promotion and education, community organization, technical support • Output-based hardware subsidies to local sanitation providers for each sanitation solution built (covering about 75% of hardware costs) • Limited schemes to facilitate access to credit • Public funds = 89% of total costs of sanitation adoption

TABLE B. CASE STUDIES: SUMMARY EVALUATION

	Bangladesh	Ecuador	Maharashtra	Mozambique	Senegal	Vietnam
Impact on sustainable access	Substantial and rapid increase in coverage, mostly sustained	Substantial increases in coverage with good evidence of use	Very rapid increases in coverage (with some cases of relapse)	Rapid increases in coverage only when software support was also provided	Speed of coverage increased when required household contribution was reduced	Rapid extension of coverage
Costs	Basic sanitation costs reasonable when compared to household income (3% to 4%)	Comprehensive sanitation solutions: costly but meet existing demand	Improved sanitation, households invest based on what they can afford	Affordable basic sanitation solutions, reduced demand when incomes grow	Comprehensive sanitation solutions but expensive by both national and international standards	Costs moderate compared to other programs but high when compared to household incomes
Effectiveness in use of public funds	High leverage	Low leverage	High leverage	Medium leverage	Low leverage	Very high leverage
Poverty targeting	Effective targeting through community involvement	Geographical targeting reached intended recipients	Means-tested targeting effective although some are excluded	Self-selection via level of service, with limited inclusion error	Geographical targeting reached intended recipients	Effective targeting, although lowest income excluded
Financial sustainability	Sustainable as long as public sector continues to contribute	Highly dependent on external financing	Low demands on external public funds	Dependent on external financing (with a marked decline when subsidies drop)	Highly dependent on external financing	Financially sustainable: initial public funds have revolved many times
Scalability	Scale-up achievable at a reasonable cost	Scale-up could be achieved given relatively high national income	Has been scaled up at federal level (coverage still needs to improve)	Was scaled up in major urban centers but further scale-up unlikely	Too expensive to scale up nationwide	Scale-up has been achieved in country
Summary evaluation	Efficient use of public funds for rural settings with strong demand for low-cost solutions	Only useful for countries willing and able to fund high levels of service	Efficient use of public funds, which are provided on an outcome basis	Efficient use of public funds with simple and effective targeting	Limited use: high demand on public funds and limited leverage	Very efficient use of limited public funds but may be hard to replicate

4 Key findings

Taken together, the case studies make a compelling case that partial public funding can trigger significantly increased access to household sanitation. The six case studies show that public investments of varying forms enabled an absolute increase in the fraction of the target population gaining access to sanitation, which varied between 20 percent and 70 percent. Each of the six sanitation programs enabled significant numbers of people to improve their sanitation; from the largest (over 21 million gained access in the Maharashtra project alone) to the smallest (over 140,000 in Ecuador). While sanitation projects have earned a reputation as difficult and often ineffective, these projects show that government investment can yield results.

The studies show that the most relevant question is not “Are subsidies good or bad?” but rather “How best can we invest public funds?” The case studies reveal a wide range of sanitation finance options and approaches. While there has been much written on the dangers of “sanitation subsidies,”⁸ it is hard to imagine a sanitation program that does not involve some public or external investment, if only to share information or stimulate demand. (While early adopters in all countries have invested in sanitation without the need for public interventions, they are usually a small minority.) The case studies reveal a wide spectrum of options: from a minimal investment in start-up of a revolving fund, to significant community mobilization and demand stimulation, all the way to hardware subsidies of up to 75 percent of capital costs in addition to community mobilization. The choice is thus not “Subsidy or no subsidy?” but rather, “What form and level of public funding makes sense in a specific context?”

The different financing strategies adopted had a profound influence, for better or for worse, on equity, scale, sustainability, levels of service, and costs. No single case study represented a “silver bullet” approach that can be replicated globally, but different models will be more appropriate with differing project objectives. One indicator of the effectiveness of public finance use is the number of households gaining basic access per US\$1,000 of public funding. This “increased access/ public funding ratio,” like most

indicators, by itself cannot tell the whole story, because both the levels of service offered and the costs varied between projects. Nevertheless, it is revealing that in rural Bangladesh US\$1,000 of public finance yielded sanitation for 135 households, while in urban Senegal the same public funding could only serve 1.6 households.

Households are key investors in on-site sanitation, and careful project design and implementation can maximize their involvement, satisfaction, and financial investment. All of the reviewed projects assumed that the poor can contribute to their own sanitation facilities, and in several cases they paid the bulk of the hardware costs. Poor households can make substantial sanitation investments (up to 25 or 30 percent of annual income, as in Vietnam) if they can see the need and potential benefits from it. Leverage of household investment also varied; in Vietnam, the household contribution to sanitation was 20 times greater than the public investment; while in three other cases public investment exceeded the household investment. The Vietnam case study shows that limited access to credit (and thus the opportunity to spread investment over time) can be a more severe problem than basic affordability for many, if not for all.

Hardware subsidies of some form played a critical role in all six case studies. These subsidies varied from a subsidized interest rate yielding US\$6 per septic tank in Vietnam to subsidies between US\$200 and US\$1,000 in Senegal, depending upon the technical options selected. On the one hand, subsidies targeted within communities to the very poorest have enabled the achievement of Open Defecation Free (ODF) Status by communities in the DISHARI project in Bangladesh; on the other hand, when a high proportion of substantial hardware costs are subsidized, as in Senegal and Ecuador, this may limit the potential scale of interventions to a relatively limited set of people given a restricted budget.

Subsidy targeting methods need to be tailored to country circumstances. The study found a range of targeting methods for hardware subsidies, including geographic targeting, means-tested targeting, community-based targeting, and self-selection. Community-based targeting (in which the community itself manages the identification and support of

8 See, for example, Kar 2003.

its poorest members) and self-selection (in which only in-kind support for the most basic sanitation is offered, leading to self-selection among potential subsidy applicants) appear to be more effective than means-tested systems, which can be costly and generate perverse incentives. Community-based selection appears to be a more flexible, better targeted, and probably less costly way to identify poor households, but it requires the right type of community mobilization and solidarity. Although no precise data were available to confirm whether self-selection is an effective targeting approach, this method appeared to be the cheapest and easiest to implement. This would seem most appropriate for those countries that have limited means to introduce either means-tested or community-based targeting approaches but seek to reach a large population through a basic sanitation program; such as in Mozambique where improved latrines are subsidized.

The provision of hardware subsidies on an output basis rather than an input basis can be effective at stimulating demand and leveraging private investment. Several of the cases used an output-based method to deliver subsidies (such as Mozambique and the Total Sanitation Campaign in Maharashtra.) Providing a subsidy on an output basis can ensure that the activity that is subsidized is actually delivered. It can also give incentives to producers to reduce costs and to serve areas which they might otherwise not consider. From a donor perspective, output-based subsidies can mitigate some of the risk of low uptake of a subsidy program: If there is no demand (if the product is not appropriate or if it is incorrectly priced, etc.) then there is no output and therefore no payment. The provision of financial rewards based on outcomes acted as a strong motivator for villages in Bangladesh and Maharashtra and helped mobilize energies around the achievement of clear goals.

All of the case studies included a significant publicly funded software component (promotion and community mobilization). The Maharashtra and Bangladesh case studies invested heavily in software (with targeted hardware subsidies for the poorest) and had some of the highest leverage and basic-access-to-investment ratios of all the case studies. The Mozambique project was most effective when the government also financed community animators for demand promotion; the decline of the program was closely linked to the withdrawal of such software support following

decentralization. Limited cost and monitoring data did not allow conclusions to be drawn about the relative effectiveness of different types of software support.

4.1 Operational implications

Early planning and careful design of financial arrangements for sanitation at the start can go a long way toward promoting project realism and sustainability. Financial arrangements probably shape the success or failure of sanitation projects more than any other factor. Answers to the basic questions of finance—“Who pays for what, when and how?”—determine the extent to which projects can replicate, expand sanitation, and meet household needs. Projects with financial designs that match local needs and capacities can take off, while projects with poor or unrealistic financial designs will stall at the end of the project cycle. Sanitation finance is thus a key element of project design, yet one that often lags because of the paucity of information, options, and sound analysis rooted in local conditions. In most urban WSS projects, for example, there has inevitably been some experience with water tariffs, and often some experience with sewer connection charges. With some important exceptions, utility or government policies promoting or financing on-site sanitation are often non-existent or, at best, ad hoc. In rural areas, the lack of documented examples and options has until now often limited the scope to “what we’ve always done.”

In addition to designing promising financial approaches, World Bank staff need to monitor them. We need good data to help our clients improve their sanitation programs and financing approaches and to learn from experience across the Bank. This means collecting basic data on the costs of promotion, the costs of hardware subsidies, the contributions made by the household, and so on. Building in such data collection and analysis from the outset will not only serve the long-term goals of allowing comparison of approaches across countries, but will also improve project monitoring and the supervision of these crucial elements of implementation during the project’s lifetime.

Operational staff must look beyond the semantics of simplistic “subsidy vs. no subsidy” debates to define an appropriate level and form of public investment in sanitation. Many sector specialists are frustrated after decades

of unrealistic, poorly designed and administered subsidy programs. They have noted that such programs are unsustainable, and have the perverse effect of stifling the development of real sanitation markets for the poor, as both suppliers and consumers waited for the next round of subsidy before investing. This frustration has recently been expressed by some who have taken a simplistic “no subsidy” position, arguing from the correct observation that hardware subsidies can sometimes limit sustainability to the invalid conclusion that hardware subsidies are always unjustified and counterproductive.

As these case studies show, a wide spectrum of finance arrangements has been used with varying degrees of success. Experience teaches that sanitation, like other goods with significant externalities, does not “take care of itself,” especially among the poor. The case studies make a strong argument for the benefits of appropriate public investment in sanitation. The challenge is to define appropriate approaches, shares, and mechanisms to finance sanitation for the poor that match the specific local context. The documented results from the six case studies in this report, and the methodology developed for their preparation and analysis, are a useful first step.

5 Gaps and further work

This study is only a first step. There are a large number of important areas where additional work is needed to provide clients and operational staff with more options and more evidence on options for public investment in sanitation. Sanitation is still at the stage where every project should be considered a “learning project” so that the benefits of experience are not lost to the future. Areas where work appears particularly urgent include these:

- **Financing urban and collective sanitation for the poor.** This study has focused on the most basic forms of sanitation, the first step up the sanitation ladder for most of those currently without access. Urban population growth and continued migration from rural areas nevertheless mean that more of the poor will live in urban settings, the density of which may prohibit on-site options. “Conventional” sewerage finance is relatively well documented⁹ (and in the developing

world usually involves a large subsidy for the relatively affluent). The specifics of sewerage finance for the urban poor (including condominal systems) are not well documented or understood globally.

- **The potential and constraints of credit (microcredit) schemes for sanitation.** The Vietnam experience marks a great success. What are the conditions under which credit support is viable and useful? Are there examples of failure, and if so, where and why?
- **OBA (Output-Based Aid) for sanitation.** This approach is conceptually attractive to donors, and with good design may be attractive to the private sector, but its practice in sanitation is poorly documented.
- **Development of better monitoring and evaluation (M&E) for sanitation.** All development activities need better M&E, but the need is particularly acute in sanitation. Financial M&E to reflect the history of costs, cost sharing, and long-term sustainability is particularly important.
- **Basic sanitation cost data and its determinants.** Despite decades of field experience, reliable estimates for the hardware and software costs of sanitation access are still scarce. Operation and maintenance costs need special attention, as they are recurrent and are often neglected to the detriment of sustainability.
- **The impact of finance mechanism on cost.** Do hardware subsidies increase the capital cost of “low cost” sanitation? Do subsidies mean that more get the same sanitation, or only that basic sanitation becomes more expensive? How can this be effectively managed?
- **Other elements of the “value chain” of sanitation (pit emptying/desludging services, waste reuse, and so on).** How are these financed? How can they be financed? How can appropriate disposal/reuse of waste be ensured?

9 Water and Environment Federation 2004.

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List of Acronyms

APL	Above poverty line
BDT	Bangladeshi taka
BPL	Below poverty line
Capex	Capital expenditure
CBO	Community-based organization
CLTS	Community Led Total Sanitation
DISHARI	Decentralized Integrated Sanitation, Hygiene and Reform Initiative
FCFA	<i>Franc Communauté Financière Africaine</i>
GDP	Gross Domestic Product
GPOBA	Global Partnership for Output-Based Aid
IEC	Information, education, and communication
IFIs	International Finance Institutions
JMP	Joint Monitoring Programme
M&E	Monitoring and evaluation
MDG	Millennium Development Goals
MTn	Mozambican metical
NGO	Non-governmental organization
NGP	Nirmal Gram Puraskar
O&M	Operations and maintenance
ODF	Open Defecation Free
Opex	Operating expenditure
PAQPUD	<i>Programme d'Assainissement Autonome des Quartiers Peri-Urbains de Dakar</i>
PLM	<i>Programa de Latrinas Melhoradas</i>
PNSBC	<i>Programa Nacional de Saneamento a Baixo Custo</i>
PPP	Purchasing Power Parity
PRAGUAS	<i>Programa de Agua y Saneamiento para Comunidades Rurales y Pequeños Municipios</i>
Rs	Indian rupees
SGBSA	<i>Sant Gadge Baba Gram Swachayata Abhiyan</i>
SHG	Self-help group
SRF	Sanitation Revolving Fund
TSC	Total Sanitation Campaign
UBS	Unidad Basica de Saneamiento
US\$	U.S. dollar
VIP	Ventilated improved pit
VND	Vietnamese dong
WHO	World Health Organization
WSP	Water and Sanitation Program

I. Introduction

The world is unlikely to meet the challenge of the sanitation target of the Millennium Development Goals (MDGs): To halve by 2015 the fraction of the world's population without access to basic sanitation. The problem is particularly acute in Sub-Saharan Africa and South Asia. There has been much debate on what is needed to accelerate the pace of sanitation coverage expansion. Most agree that additional funds need to be mobilized to close the sanitation gap, but there is much debate about *what* to spend the money on, *how* to raise the money, and *from whom* to raise it. Additional evidence is needed about what makes sanitation strategies effective and how best to finance them so as to inform policy and program development in the sanitation field.

On-site sanitation (pit latrines, septic tanks, and other household level technologies that do not involve sewerage) must play a key role in increasing access. This is particularly true in rural and peri-urban areas where space availability and population density are not constraining factors on its adoption and where on-site sanitation can be substantially cheaper and easier to promote than extending sewerage networks. The majority of the population without access to any sanitation lives in precisely such areas. Financing on-site sanitation at the household level is a complex and under-researched area, however, one seldom dealt with in its own right, separately from the financing of water or sewerage services.

On-site sanitation has its own characteristics that make its financing different from that of networked water or sewerage services. Despite evidence of positive externalities (on public health, the environment, and general economic development), the construction of domestic on-site sanitation facilities is usually considered to be a household responsibility.

When building such facilities, households face relatively high up-front investment costs, depending on the level of service they choose. Associated operating and maintenance costs vary depending on the type of facilities, but are usually fairly low. Operating and maintenance costs mostly consist of direct household expenses (rather than charges paid to cover the costs of a service provider) and periodic charges for emptying the facility when it becomes full (although households can also elect to do this themselves, as a way of keeping costs down). Utilities providing sewerage services are seldom involved in the provision of on-site sanitation services (with some notable exceptions, such as in Burkina Faso, where on-site sanitation is financed via the proceeds of a sanitation tax levied on customers receiving sewerage services). As a result, tariffs to recover the costs of providing a service are not relevant for on-site sanitation in the way they would be for water or sewerage services.

Traditionally, governments have either ignored on-site sanitation altogether (leaving households to build their own latrines and pay for their maintenance) or gone to the other extreme of supporting heavily subsidized latrine-building programs. Such top-down subsidized programs have increasingly been discredited, for a number of reasons. On the one hand, they have often built facilities that people did not want and therefore did not use. In addition, subsidies have often been captured by the wrong people; many such schemes were heavily dependent on external funding and were not sustainable when external funding stopped.

Despite this apparent lack of success, a growing body of evidence makes the case for public support to improve sanitation for all, including the poor.¹

¹ For example, in Sub-Saharan Africa, where there has been limited investment from governments and donors in on-site sanitation, the Africa Infrastructure Country Diagnostic (AICD) showed that, on average, 50% of the population use unimproved traditional latrines while 34% resort to open defecation. Only the families in the top three income quintiles are likely to have improved sanitation facilities, and the majority of cases of household investment in improved sanitation were in the higher-income households.

A key objective of the present study is therefore to evaluate alternative financial approaches for governments, international donors, or NGOs to support on-site sanitation. A critical question from a public financing point of view is whether households should face the full cost of investing in on-site sanitation or whether such costs should be borne in part by the public sector. “Public support” can include taxes or international transfers intended to reflect the external benefits derived from sanitation for society as a whole.

A number of basic but relevant questions remain unanswered, such as these:

- How much does providing access via on-site sanitation really cost, that is, once all cost components are taken into consideration, including hardware and software?
- Should the public sector support household investment in on-site sanitation? If so, should it be via subsidies or by facilitating access to finance via the establishment of credit schemes?
- Should hardware subsidies be provided to households, or should public spending be focused on promoting demand and/or supporting the supply side of the market?
- If hardware subsidies are provided, what is the best way to design them to ensure that they reach their intended recipients and are sustainable and scalable?
- What innovative mechanisms (such as credit or revolving funds) can be used to promote household sanitation financing?

To start addressing these questions, the Sanitation and Hygiene Global Practice Team of the Water and Sanitation Program (WSP) and the Water Anchor of the World Bank conceptualized, designed and commissioned this global study to gain deeper understanding of current financing approaches for on-site sanitation and their effectiveness in reaching the poor. Such understanding can help sector professionals develop better, more realistic, and more sustainable on-site sanitation projects and programs.

BOX 1.2 – KEY DEFINITIONS

Defining on-site sanitation. The word sanitation has a wide range of meanings in different contexts and languages. In conformity with the Joint Monitoring Programme (JMP) for Drinking Water Supply and Sanitation (the official monitor of the MDG sanitation target), this study defines sanitation as the methods for the safe and sustainable management of human excreta, including the collection, storage, treatment, and disposal/reuse of feces and urine. There are two main types of sanitation: on-site systems (such as latrines, cesspits, septic tanks) and off-site systems, principally sewerage networks. This study focuses exclusively on on-site sanitation systems, which are often the most cost-effective solution to meet the MDGs in many contexts, especially in rural and peri-urban areas.² More specifically, the study focuses on on-site sanitation facilities at the household level and does not cover communal or school facilities, since financing approaches for the latter are different.

Defining finance. The study examines how increased access to sanitation infrastructure at the household level can be financed from a mix of household investments and public subsidies. This includes the financing of initial access via capital expenditure as well as the financing of operations and maintenance costs to ensure the ongoing use of the facilities.³ Software costs, which are the costs of “soft” activities for creating demand or mobilizing communities, are included in the total estimated costs. The study examines both the financing sources (where the funds come from) and the financing approaches (how the financing sources are combined to cover costs and what mechanisms are used to provide public support, including hardware subsidies, software support, or facilitated access to credit).

2 Some projects reviewed as part of this study also offered network-based solutions. Where it was the case, this has been noted, but the network-based components were not analyzed. A potential second phase of the study may examine network-based sanitation solutions, including community toilets (connected to a network), small-bore sewers, or traditional sewers.

3 The financing of treatment activities is not considered here, as such. While treatment activities may confer environmental benefits, they do not directly contribute to meeting the Millennium Development Goals.

1.1 Methodology

The findings of this report rest primarily on six case studies illustrating a range of approaches to financing on-site sanitation. Case studies were selected in regions where WSP and the World Bank work and where meeting the sanitation MDGs is a challenge. (See Annex G for more details on the methodological framework.)

METHODOLOGY FOR CASE STUDY SELECTION

The first step of the study consisted of identifying the range of financing approaches that can be used to cover the costs of on-site sanitation investments, that is, how the different potential sources of finance (including household investment and public support) can be combined. These financing approaches were classified according to the mix of public and private funds used (ranging from full private financing to full public financing) and the type of mechanisms used to provide public funds. The results of this initial analysis are shown in Table 1.1 below, together with the case studies selected to illustrate these approaches.

The six case studies were selected to represent a range of approaches to financing on-site sanitation at the household level. Approaches ranged from those that combined subsidies for software activities with limited targeted hardware subsidies for poor households (such as in Bangladesh and India) to approaches with a relatively high hardware subsidy (such as in Senegal or Ecuador). Some approaches, such as the Sanitation Revolving Fund in Vietnam, are relatively innovative and therefore less widespread; they are nevertheless representative of growing efforts to use micro-finance instruments to increase access to essential services,

such as sanitation.⁴ The diversity in financing approaches is also reflected in different approaches to program design, with programs ranging from community-led programs for investment in basic sanitation (as in Bangladesh) to programs providing a well-defined set of improved sanitation solutions (as in Senegal).⁵

Given the emphasis placed on evaluating the best strategies for public support, the choice was made *not* to review cases where household investments take place spontaneously without public involvement. Although unsupported household investments often account for the majority of investments in on-site sanitation (as reported by the UK Department for International Development in India for example), such investments are often unaffordable for the poorest or may lead to sub-standard latrines that do not yield the health benefits associated with improved latrines (as per the Joint Monitoring Programme's definition). At the other extreme, approaches that involved only public funds without household contributions were also ruled out from the start, since they could only be contemplated in a limited set of countries that could afford them (such as South Africa).

Additional criteria for case study selection included these:

- The projects needed to be perceived as successes and to be well implemented;
- The case studies had to consist of relatively large projects or programs in terms of size of investment and number of beneficiaries, with a sufficiently long track record (about four to five years) and readily available financial information; and
- Apart from donor-supported projects, long-term government programs developed without substantial donor assistance and NGO-led projects were to be included.⁶

⁴ See Mehta 2008.

⁵ In the rest of this report, each case is referred to by the country name (or the state name in the case of Maharashtra).

⁶ Although the case studies include both projects and programs, they are all referred to as "projects" for ease of reference.

TABLE 1.1. POTENTIAL FINANCING APPROACHES FOR ON-SITE SANITATION

Financing approach	Potential advantages	Potential risks	Case studies
Financing sources: Purely private (households)			
Self-financing: Households invest in their own facilities and pay for sludge-emptying services – No subsidy	<ul style="list-style-type: none"> Majority of latrines are currently financed privately this way Reflects existing demand No use of public funds 	<ul style="list-style-type: none"> Risk of poor quality infrastructure Does not fully consider environmental impact Suppliers may not exist Unaffordable for the very poor 	<ul style="list-style-type: none"> Not included since the research is focused on external support
Sanitation surcharge: Cross-subsidy to finance on-site sanitation	<ul style="list-style-type: none"> Use of cross-subsidies 	<ul style="list-style-type: none"> Available funds may be limited due to affordability constraints 	<ul style="list-style-type: none"> Limited experiences (e.g. Burkina Faso)
Financing sources: Combination of private (household) and public funds (taxpayer monies and external sources)			
Loans to households, including microcredit for sanitation or home improvement (e.g., revolving funds)	<ul style="list-style-type: none"> Particularly useful in cohesive communities aiming at 100% sanitation Limits initial outlay of public funds Subsidy linked to outcome 	<ul style="list-style-type: none"> Demand for sanitation needs to be stimulated Requires a solid institution to manage funds May be unaffordable for the very poor 	<ul style="list-style-type: none"> Vietnam (Sanitation Revolving Fund)
Software support, with low/no subsidy for hardware	<ul style="list-style-type: none"> Focuses subsidies on creating demand Relies on community cohesion/solidarity 	<ul style="list-style-type: none"> Sustainability at risk once the initial attention / champion or other motivating factor disappears 	<ul style="list-style-type: none"> India (TSC in Maharashtra) Bangladesh (DISHARI)
Loans to private-sector providers	<ul style="list-style-type: none"> Lift constraints for small scale independent providers (SSIPs) to expand their services 	<ul style="list-style-type: none"> Services may not reach the very poor Not sufficient demand to keep the business running if not combined with hygiene & sanitation promotion 	<ul style="list-style-type: none"> Few cases currently in existence – no specific case study
Non-financial support to providers (training, demand creation)	<ul style="list-style-type: none"> Boosts private-sector development so that supply can meet demand for sanitation facilities 	<ul style="list-style-type: none"> Services may not reach the very poor 	<ul style="list-style-type: none"> Elements of this approach reviewed in several cases
Output-based aid: Grants to households or SSIPs based on outputs or outcomes	<ul style="list-style-type: none"> Subsidy linked to actual outputs delivered 	<ul style="list-style-type: none"> Requires private sector prefinancing, which may not be forthcoming 	<ul style="list-style-type: none"> Mozambique: Improved Latrines Program India (TSC in Maharashtra)
Partial hardware subsidy: Users contribute in kind or in cash	<ul style="list-style-type: none"> Enhances ownership of facility Improves affordability 	<ul style="list-style-type: none"> May be unaffordable for the very poor May be an unsustainable drain on resources 	<ul style="list-style-type: none"> Ecuador (PRAGUAS) Senegal (PAQPUD)
Financing source: Purely public (taxpayer monies and external sources)			
Full subsidy: Households receive facilities as a gift	<ul style="list-style-type: none"> Removes affordability constraint for the very poor (if they capture the subsidy) 	<ul style="list-style-type: none"> Can crowd out household resources No demand test, so facilities often not used 	<ul style="list-style-type: none"> Not included because not deemed sustainable

Table 1.2 shows key characteristics of the selected cases, presented in increasing order of public financing as a percentage of total initial costs (both hardware and software).

TABLE 1.2. CASE STUDIES OF HOUSEHOLD SANITATION AND FINANCING APPROACHES

Country, project, areas, level of service, population that adopted sanitation, study period	Financing approach
Vietnam: Sanitation Revolving Fund (SRF) - urban areas • Mostly bathrooms and septic tanks • 194,000 people • 2001 to 2008	<ul style="list-style-type: none"> • Software support for sanitation promotion and hygiene education • Facilitated access to credit via sanitation revolving funds • Subsidized interest rates on loans for hardware construction (accounting for about 3% of hardware costs) • Public funds = 7% of total costs of sanitation adoption
Maharashtra (India): Total Sanitation Campaign (TSC) - rural areas • Improved latrines • 21,200,000 people • July 2000 to November 2008	<ul style="list-style-type: none"> • Software support for community mobilization, including outcome-based financial rewards to villages reaching Open Defecation Free (ODF) status to be spent on sanitation investments • Outcome-based hardware subsidies for below-poverty households (covering about 22% of hardware costs for beneficiaries) • Access to credit in some districts only • Public funds = 9% of total costs of sanitation adoption
Bangladesh: Dishari (based on Community Led Total Sanitation) - rural areas • Basic latrines • 1,631,000 people • 2004 to 2008	<ul style="list-style-type: none"> • Software support for community mobilization, sanitation promotion, local government strengthening, including outcome-based financial rewards to villages which are 100% sanitized. Rewards come with no strings attached and do not necessarily need to be spent on sanitation • Up-front in-kind hardware subsidies targeted on the poorest (covering about 42% of hardware costs for beneficiaries) • Public funds = 31% of total costs of sanitation adoption
Mozambique: Improved Latrines Program (PLM) - urban areas • Improved latrines • 1,888,000 people • 1980 to 2007	<ul style="list-style-type: none"> • Software support for sanitation promotion and establishment of local workshops building slabs and latrines • Output-based subsidies to local sanitation providers for each slab or latrine sold (intended to cover 40% to 60% of hardware costs) • Public funds = 58 % of total costs of sanitation adoption (estimated)
Ecuador: PRAGUAS - rural areas • Sanitation units (toilet, septic tank, sink, shower) • 143,000 people • 2001 to 2006	<ul style="list-style-type: none"> • Software support to strengthen municipalities to work in sanitation, for technical designs and monitoring • Up-front fixed hardware subsidies (covering about 60% of hardware costs) provided to communities • Public funds = 85% of total costs of sanitation adoption
Senegal: PAQPUD - urban areas • Range of options: improved latrines to septic tanks • 411,000 people • 2002 to 2005 (not including extensions via GPOBA)	<ul style="list-style-type: none"> • Software support for sanitation promotion, including hygiene promotion and education, community organization, technical support • Output-based hardware subsidies to local sanitation providers for each sanitation solution built (covering about 75% of hardware costs) • Limited schemes to facilitate access to credit • Public funds = 89% of total costs of sanitation adoption

APPROACH TO DATA COLLECTION

The principal investigator provided overall guidance and supervision for the preparation of the case studies based on a common methodological framework (see Annex G for more details). The methodology was based on the following two principles:

Counting all the costs. To assess the true cost of access provision, all the costs associated with the sanitation interventions were counted, including hardware and software costs. For hardware, both the initial capital expenditure and an estimation of the ongoing operations and maintenance costs were included. Software costs include those of such activities as demand promotion or media campaigns, as well as project management costs and the sums provided as financial rewards to villages, wherever that was applicable (Bangladesh and Maharashtra). This also required separation of the household on-site sanitation costs from those of other project components. In several cases, the on-site sanitation component for households represented only a small portion of the overall project (as little as 3 percent of total project costs in Vietnam, which also included the renovation and expansion of sewerage networks and improvement of the overall management of the utilities).

Including all sources of funds. On-site sanitation investments can be financed from three main sources: the households themselves, government funds, or international transfers (from IFIs, donors, or NGOs). Households are often the main source of funds, and yet few projects or studies track their contributions to the initial investment. When actual data on household investment was not available, estimates were based on the investment costs and the public sector contribution.

Each case study was conducted by local and international consultants familiar with the country context. Information for the case studies was collected via interviews with project staff, sector specialists, field visits, and, where possible, focus group discussions with project beneficiaries. In-country consultants had three to eight weeks to gather and analyze the data, depending on information availability and on the size of the program under review. This process ensured that the data were compiled and interpreted as consistently as possible, given the constraints imposed by the limited data. All numerical information was computed in a comparable spreadsheet format to ensure consistency in the way the indicators were estimated (these spreadsheets are available on request).

The availability of reliable information varied substantially from one case study to another. Available data were particularly limited for Mozambique and Ecuador, requiring additional assumptions for some calculations. Such assumptions are set out clearly in the body of the case studies, so that the methodology used for deriving key indicators can be followed.

Case studies' evaluation criteria

The case studies were evaluated by a common set of indicators, grouped under six main headings, as shown in Table 1.3 below. This review has tried to maintain, as much as possible, a distinction between evaluating the success of the overall approach to sanitation provision and evaluating the financing elements. Thus the first group of indicators evaluates the overall impact the projects and programs had on extending sustainable access, while the remaining indicators focus on the costs, the effectiveness in use of public funds, the ability to target poor customers via financial support, and the potential to sustain and scale up the program based on financial considerations.

TABLE 1.3. CASE STUDIES EVALUATION CRITERIA

Criteria	Indicators
1. Impact on sustainable access to services: Did the project contribute to increasing access to sanitation?	<ul style="list-style-type: none"> • Number of households acquiring sanitation • Corresponding increase in coverage ratio • Number of communities reaching ODF status • Percentage of latrines used and maintained five years later
2. Costs: Are the costs of the resulting sanitation facilities reasonable and affordable to the beneficiaries?	<ul style="list-style-type: none"> • Total unit costs per sanitation solution⁷ (including a breakdown between hardware and software costs) • Hardware costs as percentage of household income (for average and poor households) • Operating costs per sanitation solution • Operating costs as percentage of household income (for average and poor households)
3. Effectiveness in the use of public funds: Were public funds used in a way that maximized impact?	<ul style="list-style-type: none"> • Number of sanitation solutions built for US\$1,000 of public funding (“increased access / public funding ratio”) • Ratio of household investments over public funds provided (“leverage ratio”)
4. Poverty targeting: Did the program deliberately seek to target the poor, and was the program effective at doing so?	<ul style="list-style-type: none"> • Available evidence on whether the program deliberately targeted the poor or not • Errors of exclusion (when the poor do not receive a subsidy) and inclusion (when “nonpoor” get a subsidy)
5. Financial sustainability: Could the approach be sustained over time without the need for external support?	<ul style="list-style-type: none"> • Percentage of initial costs covered by public funds • Percentage of operating costs covered by public funds
6. Scalability: Could the approach be scaled up to cover those who are not yet covered in the country at reasonable cost?	<ul style="list-style-type: none"> • Costs of scaling up approach to cover remaining uncovered households (either in rural or urban areas) compared to sanitation budget and overall state budget

⁷ Note: a *sanitation solution* in this document refers to the package of hardware furnished to a household by a sanitation program, and may include a number of hardware facilities, for example it might consist only of a latrine, or it might be a latrine and washstand with soakaway. In a number of programs, the household has some say in the level or content of the sanitation solution.

THE STUDY WAS DEVELOPED AS PART OF A GROWING BODY OF RESEARCH IN THE AREA

Although the effectiveness of subsidies has been systematically evaluated in other sectors, such as water supply or electricity, this has not yet been done for sanitation. The present study was therefore designed to be a first step towards a better understanding and comparison of alternative household sanitation financing approaches.

The study has its limitations. For example, within the limited scope of the study it was not possible to carry out a comprehensive survey of sanitation investments in a large number of locations. Accordingly, we were unable to derive robust and representative data on the costs of household

sanitation facilities that could be used for benchmarking purposes. Instead, for each of the six case studies reviewed, point estimates have been provided that reflect service levels, geographical location, and the dates of each project. Other parallel studies have been developing evidence on the costs of household sanitation (among other things) as shown in Box 1.2 below.

The combination of all these studies should help develop a much better understanding of the costs of providing on-site sanitation and optimal financing approaches in the next few years.

BOX 1.2. EXAMPLES OF OTHER STUDIES GATHERING DATA ON HOUSEHOLD SANITATION

- The Economics of Sanitation Initiative (ESI), undertaken by WSP. This initiative started in 2006 in the East Asia Pacific region, has since been extended to South Asia, and will soon be extended to Africa. In Phase 2 of the study, which began in 2008, a cost-benefit analysis of a range of sanitation options is being conducted for both rural and urban areas in the East Asia Pacific region as well as the Yunnan Province in the South of China, and later in 2009 in India. Costs of on- and off-site sanitation options are being estimated using surveys of households, projects, and private and municipal providers. The results will be available for all East Asia Pacific countries in early 2010.
- The WashCosts study, undertaken by IRC (www.irc.nl) with support from the Gates Foundation, researches the life-cycle costs of water, sanitation, and hygiene (WASH) services in rural and peri-urban areas in four countries (Burkina Faso, Mozambique, Ghana, and India). This action research project started in February 2008 and aims to present findings by 2012.
- A study for Plan International on the costs of Plan's sanitation programs was initiated in order to further enhance the organization's policies in this area. The objectives of the study included evaluating the unit costs, cost-sharing schemes, and expenditure patterns associated with Plan's programs and comparing Plan's program costs and cost-sharing schemes with those of other agencies operating in the same areas.
- A study for the French Ministry of Foreign Affairs evaluated sanitation financing approaches based on case studies in urban areas of Senegal, Burkina Faso, Mali, and Niger. A practical guide to help local authorities organize the financing of sanitation within their jurisdictions will be a direct output of this study.

1.2 Report structure

The rest of this report is structured as follows:

- *Section 2* introduces the main characteristics of the financing approaches used in the case studies;
- *Section 3* presents the main results of the comparative analysis of the financing approaches;
- *Section 4* identifies key findings based on the analysis and charts the way forward to improve the design of projects and programs to finance on-site sanitation at the household level.

A series of Annexes provides additional information on the case study results and the methodology used to compile them:

- *Annexes A to F* contain summary case studies presented in a common format to facilitate comparisons, including an evaluation of what seems to have worked and what has not worked;
- *Annex G* gives background information concerning on-site sanitation service levels, types of costs, and sources of funds, intended for those not familiar with the sector;
- *Annex H* contains standard Terms of Reference used for preparing the case studies; and
- *Annex I* contains an indicative bibliography.

II. Overview of case study financing approaches

This section places the case studies in their country context (Section 2.1) and provides a summary description of the project and financing approaches used in the six cases (Section 2.2). This is followed by a summary analysis of how external financial support has been provided in each case, mainly through hardware subsidies (Section 2.3) and software support (Section 2.4), with facilitated access to credit provided only in certain cases (included as a hardware subsidy in the Vietnam case).⁸

2.1 Case studies' country contexts

The financing approaches we reviewed developed in significantly different contexts, which must be considered when comparing the relative achievements and limitations of these approaches. Key data on the case study countries are shown in Table 2.1 below.

In terms of macroeconomic indicators, four of the countries are classified as low-income countries (Bangladesh, Mozambique, Senegal, and Vietnam) while Ecuador and

India are both lower- middle-income countries. Bangladesh and Mozambique are the two poorest countries in the set. At the other end of the spectrum, Ecuador is the richest country, thanks to substantial natural resources (oil in particular), although this wealth is unequally distributed and 40 percent of the population is estimated to be below the poverty line, with a heavy incidence of poverty in rural areas in particular. Vietnam, Senegal and India are all in the middle range, but their relative wealth per capita varies substantially when compared on a purchasing-power-parity (PPP) basis.

Sanitation coverage varied substantially from one country to the next, especially when comparing areas where the projects and programs under review have been developed.

Sanitation coverage, in Table 2.1, is for either urban or rural areas, depending on the project service areas of the case studies. Specifically, it is shown for rural areas in Bangladesh, Ecuador and Maharashtra and for urban areas in Mozambique, Senegal, and Vietnam.

TABLE 2.1. KEY CASE STUDY COUNTRY INDICATORS

	Bangladesh	Ecuador	Maharashtra	Mozambique	Senegal	Vietnam
Population (millions)	159	13.7	96.7	20.3	12.2	85.6
GDP per capita (US\$)	\$463	\$3,335	\$941*	\$396	\$914	\$828
GDP per capita (PPP US\$) ⁹	\$1,311	\$7,242	\$2,563	\$842	\$1,692	\$2,589
Sanitation access, urban				44%	64% **	88%
Sanitation access, rural	88%	70%	27%			

Source for population and GDP: International Monetary Fund – World Economic Outlook – latest data available (2007)

Source for sanitation coverage: Latest available data in each of the countries for the types of areas where the case studies are taking place. See case studies in Annexes for more details on the nature and sources of the coverage data.

* The GDP figure is for India as a whole. Note that Maharashtra is one of the richest states in the country.

** Urban coverage data for Dakar region only, as this is the project's area. Coverage in small towns is only 39%

8 The term *software support* is used rather than *software subsidies* to reflect the fact that most practitioners in the sanitation field usually refer to *hardware* subsidies when talking about subsidies in general.

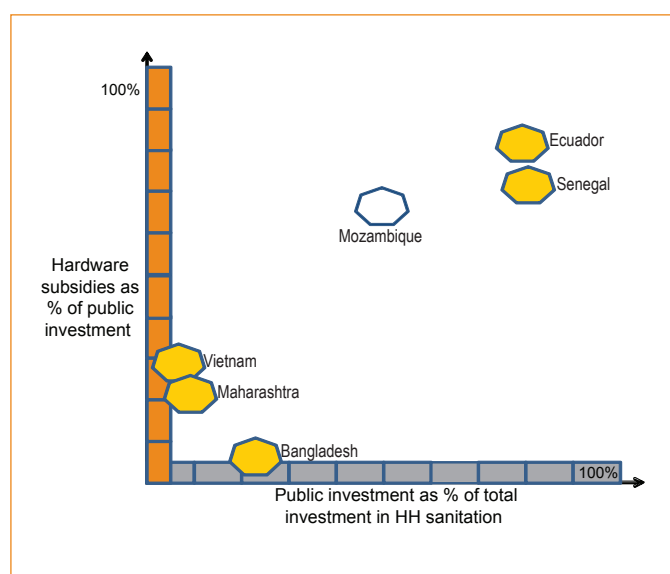
9 PPP (Purchasing Power Parity) exchange rates equalize the purchasing power of different currencies in their home countries for a given basket of goods.

2.2 Summary of financing approaches

Key features of the financing approaches used in the case studies are represented in Figure 2.1 below. The horizontal axis shows the level of public sector finance as a proportion of the initial hardware and software costs of sanitation, while the vertical axis reflects the percentage of such public support that was spent on hardware subsidies. Although there are important differences, the financing approaches broadly fit into three groups:

- At one end of the spectrum, **Vietnam, Bangladesh, and Maharashtra** primarily relied on households to invest in their own facilities. Public support was provided to promote and create demand for sanitation. Hardware subsidies were fairly limited overall, although targeted subsidies were given to poor households to address affordability issues in Bangladesh and Maharashtra;
- At the other end of the spectrum, **Senegal and Ecuador** provided substantial public support, primarily in the form of hardware subsidies;
- **Mozambique** was somewhere in the middle, as it relied on partial hardware subsidies provided to local suppliers to build improved latrines.

FIGURE 2.1 CHARACTERIZING FINANCING APPROACHES TO ON-SITE HOUSEHOLD SANITATION



Note: Data for Mozambique were estimated for the situation in the late 1990s (the “heyday” of the program), given that actual data were not available and could no longer be collected for that period.

2.2.1 Bangladesh

The **Dishari** project was initiated in 2004 by a group of donors and NGOs (including WSP, WaterAid, Plan International, and the Dhaka Ahsania Mission). Its main objectives were to scale up the Community Led Total Sanitation approach (CLTS). CLTS, originally developed in Bangladesh and now being adopted more widely, emphasizes community mobilization for the eradication of open defecation. The project aimed to strengthen local governments to become the main implementers of the approach instead of NGOs. This ongoing project has been working in five districts over four years to complement the government’s national sanitation program, and it has contributed to sanitation adoption by 1.6 million people. The average hardware cost of the latrines built through the program was US\$17.

The Dishari project’s financial approach relies mainly on software support for community mobilization activities and sanitation promotion, with about US\$7 spent on software support per household (or 28 percent of the total costs of sanitation adoption). The households are responsible for investing in latrine construction. They use locally available materials and simple designs to build relatively cheap hygienic latrines that they can afford and which meet their needs (although they do not necessarily comply with JMP’s definition of improved sanitation).

The government provides monetary rewards to unions and subdistricts that are 100 percent sanitized (about US\$2,900 per union and US\$7,250 per subdistrict). These rewards come with no strings attached and can be spent on any type of local development project. Combined with the prestige they bestow and other nonmonetary benefits, these rewards have served as a strong motivator for local leaders and have introduced a competitive drive between villages to improve access to sanitation.

In addition, to lift the affordability constraint for very poor households, the government has introduced an in-kind up-front hardware subsidy (equivalent to about US\$7 per subsidized household). This scheme provides construction materials to households identified on the basis of strict criteria and community meetings. (Eligible households have an estimated income of less than US\$290 per household per year). About 7 percent of households in the project area benefited from this subsidy, which covered approximately 42 percent of the hardware costs associated with sanitation adoption.

Table 2.2 below provides key figures to summarize the financing approaches in each case study. Each of the case study projects and programs is summarized in sections 2.2.1 to 2.2.6. The case study annexes contain more detailed summaries of each case.

TABLE 2.2. OVERVIEW OF CASE STUDIES FINANCING APPROACHES

Case Country	Bangladesh	Ecuador	Maharashtra	Mozambique	Senegal	Vietnam
Project Name	DISHARI	PRAGUAS	Total Sanitation Campaign (TSC)	Programa de Latrinas Melhoradas (PLM)	PAQPUD	Sanitation Revolving Fund
Sources of public finance	WSP, WaterAid, Plan International, local NGO	Govt. of Ecuador, World Bank	Govt. of India & Govt. of Maharashtra	Govt. of Mozambique, Donors (UNDP)	Govt. of Senegal, World Bank	World Bank, Govts. of Australia, Denmark and Finland
Household on-site sanitation component as % of total project costs	84%	20%	71%	100%	60%	3%
Project Size: People reached with sanitation via the project	1,631,000	141,000	21,200,000	1,888,000	411,000	194,000
Average hardware cost of sanitation solution (US\$)	\$17	\$355	\$208	\$70	\$568	\$197
Hardware subsidy amount (only when provided) (US\$)	\$7	\$210	\$24	n.a.	\$200 to \$1,000	\$6
Total hardware subsidies as percentage of total hardware costs	42%	59%	22%	50%	75%	3%
Percent of households in project area that received hardware subsidy	7%	100%	20-69%	100%	100%	100%
Software support/household reached with sanitation (US\$)	\$7	\$46	\$15	n.a.	\$144	\$21
Software support as percentage of total sanitation costs (per household)	28%	12%	7%	n.a.	20%	10%
Software support as percentage of total public funds for on-site sanitation	92%	14%	78%	30%	23%	70%
Indicative annual household income for below-poverty and/or bottom 40% income in project area (US\$) *	\$290	\$1,652	\$400	\$741	\$897	\$574
GDP per capita (US\$)	\$463	\$3,335	\$941	\$396	\$914	\$828

* This is income per household, based on 5 people per household. This had to be normalized for households in Senegal, where average household size is 9 persons.

2.2.2 Ecuador

The PRAGUAS project (*Programa de Agua y Saneamiento para Comunidades Rurales y Pequeños Municipios*) aimed at improving water and sanitation services in small towns and rural areas as well as the capacity of their service providers. The project was financed by the central government (with the support of a World Bank loan) together with municipalities and the beneficiary communities. The focus of the first phase of the project (2001-2006) was on small municipalities, those with cantonal capitals of fewer than 10,000 inhabitants (152 out of a total of 219 municipalities were eligible). It enabled about 140,000 people to gain access to improved sanitation over the course of 4.5 years. The average hardware cost of the solutions built was US\$355, although costs could be much higher depending on the level of service chosen and the location (as transport costs can represent a substantial portion of total investment).

The PRAGUAS project had a strong up-front component to mobilize and organize communities to adopt sanitation (US\$46 was spent on software support per household, which represented 12 percent of the total costs of sanitation adoption).

The project provided an up-front fixed hardware subsidy to households for the construction of on-site sanitation solutions. The subsidy provided by the Government through the project was capped at US\$210 in Phase 1. This increased to US\$315 in Phase 2 to reflect increases in the cost of a basic improved latrine. The level of subsidy was set to cover 70 percent of hardware costs for a basic improved sanitation solution, so as to ensure that poor families could afford improved sanitation. The remainder was to be financed by the communities in the form of labor, material, and cash. Households were free to choose a more expensive solution but had to finance all additional costs over and above this fixed subsidy. Households could choose the level of service based on a broad catalog of technical solutions, ranging from improved traditional latrines to a basic sanitation unit (or UBS, for *unidad básica de saneamiento*) which integrates a shower, a sink, a flush toilet, and a septic tank. A majority of households chose this higher level of service, which means that the subsidy they received covered a smaller portion of their investment (about 60 percent on average).

2.2.3 Maharashtra (India)

The **Total Sanitation Campaign (TSC)** is a nationwide program, primarily funded by the Government of India, whose implementation varies from state to state. The case study focuses on how the TSC has been implemented in the State of Maharashtra. The approach is based on a CLTS approach to promoting sanitation, combined with small hardware subsidies for the poorest households and monetary rewards for villages that achieve overall cleanliness objectives. Since being introduced in Maharashtra in 2000, the approach has incentivized more than 21 million people to adopt improved sanitation. On average, the hardware cost per sanitation solution built was US\$208.

Under the TSC program, software activities are conducted to generate demand and village-level mobilization. Separately from the TSC, monetary rewards are provided to villages that reach ODF status. The Nirmal Gram Puraskar (NGP) is a national program which provides one-off monetary rewards from the central government to qualifying gram panchayats (village-level governments). Payments are based on a set of criteria that include, among others, 100 percent sanitation coverage of individual households and being totally free from open defecation. The payments are made following a thorough verification process. These rewards can be anywhere from US\$1,250 to US\$12,500 per gram panchayat, depending on the population. Gram panchayats can use the cash incentive to improve and maintain sanitation facilities in their respective areas with a focus on solid and liquid waste disposal and maintenance of sanitation standards. In addition, the State of Maharashtra has introduced a number of state-based campaigns, such as the Clean Village campaign (*Sant Gadge Baba Gram Swachayata Abhiyan* or SGBSA) which takes place annually and encourages maintaining overall cleanliness in the villages. In total, approximately US\$15 was spent on software support per household (including the costs of the financial reward schemes), which represented about 7 percent of total sanitation adoption costs.

Hardware subsidies are provided to below-poverty-line (BPL) households *after* the village has been declared ODF. Since they are outcome-based, they are referred to as “incentives” in the TSC guidelines, provided to households “in recognition of their achievements.” The initial level of subsidy was Rs

500 (US\$10) per BPL household, although this was raised to Rs 1,200 (US\$24) in March 2006 to reflect cost inflation. The subsidy was initially intended to cover 80 percent of the hardware costs of a basic sanitation solution for BPL households, but in practice it covers only about 20 percent of hardware costs since most BPL households chose to invest in a higher level of service than the basic minimum.

Finally, in some areas access to credit has been provided in order to speed up the process of adopting sanitation. In those districts where it was systematically introduced, it has supported stronger demand for sanitation. However, these financial products tended to be more widely available in comparatively richer districts and largely benefited APL (above-poverty-line) households in those districts.

2.2.4 Mozambique

The **Improved Latrines Program** (*Programa de Latrinas Melhoradas, or PLM*) was initiated in Mozambique in the early 1980s in difficult circumstances, including civil war and extreme poverty. Initially funded by external donors (including UNDP) and later transferred to the Government of Mozambique, the program 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, referred to by the program as “PLM workshops,” are neither purely public nor private. The approach to the program has evolved substantially over the years. Over the last 17 years, the program has benefited almost 2 million people in the peri-urban areas of all the major towns. The average hardware cost of the sanitation solution built under the program (the improved latrine) was around US\$70.

The program initially helped to set up these production workshops through a combination of software support (such as training activities) and subsidies. In many cases, the land on which the workshops operated was provided for free by the government. In 1992, the government started providing production subsidies to the workshops based on their sales. As

such, the program can be seen as an early form of providing output-based subsidies. The subsidies were intended to cover 40 to 60 percent of production costs, depending on the region, to reflect differences in input costs and poverty levels and to reduce the sale price to households. Beginning in 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, since this system was dismantled following decentralization.¹⁰

2.2.5 Senegal

PAQPUD (Programme d’Assainissement Autonome des Quartiers Périurbains de Dakar) is a program initiated in the framework of a World Bank loan, to provide sanitation services in poor peri-urban areas around Dakar, Senegal’s capital. The program, which was developed between 2002 and 2008, offered a wide range of sanitation solutions, mostly on-site facilities as well as small-bore sewers in areas where on-site sanitation could not be considered for technical reasons. Over that period, the program benefited more than 400,000 people, although a large proportion of the facilities built were for the management of gray water rather than human excreta. The hardware costs of the sanitation solutions built through the program varied substantially depending on the solution retained, with an average of about US\$568 per household covered; bearing in mind that each household received 1.56 sanitation facilities on average as they could apply for a subsidy for several facilities, ranging from latrines and septic tanks to washing facilities.¹¹

Software support was provided to develop a catalog of services, promote sanitation and hygiene, and organize community mobilization. On average, software support represented US\$144 per sanitation solution built, or 20 percent of the total costs of sanitation adoption. The entrepreneurs building the sanitation facilities were paid directly through the project for each one built based on a price schedule/facility. This is equivalent to an output-based subsidy,

¹⁰ 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 the provincial governments. Some provinces stopped giving the subsidies, and others kept their level unchanged since 2000, even while 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.

¹¹ Investments almost always included a washing facility and soakaway (Bac à Laver Puisard), which contributes to the overall cleanliness of the yard and can reduce the incidence of diseases but is not a sanitation solution by our definition (or that of the JMP) since it does not contribute to safe excreta management.

something which was later formalized through an extension of the project via the Global Partnership for Output Based Aid (GPOBA) which was ongoing as of mid-2009. The beneficiary households were required to make an up-front contribution in order to obtain access. Based on a willingness-to-pay survey, households were initially required to contribute 50 percent of hardware costs, but the hardware subsidy was subsequently increased to cover 75 percent of hardware costs given limited demand for the facilities and initially low uptake. The hardware subsidy provided by the program ranged from US\$200 to US\$1,000 per sanitation solution, depending on the costs of each solution. Access to credit was provided in the second phase in order to spread the burden of this contribution over time.

2.2.6 Vietnam

A **Sanitation Revolving Fund (SRF)** component to provide loans to low-income households for building on-site sanitation facilities was incorporated into the broader World Bank-financed Three Cities Sanitation Project. Working capital for the revolving funds was provided by the World Bank, the Governments of Australia, Finland and Denmark for three sub-projects in Danang City, Haiphong City, and Quang Ninh Province (Halong City and Campha Town). The local utilities initiated the revolving funds and placed them under the management of the Women’s Union, a pervasive organization throughout the country with long experience in managing microfinance schemes. The program benefited almost 200,000 people over the course of seven years. The average hardware cost of the sanitation facilities built through the program was US\$197. These facilities included mostly septic tanks but also urine diverting / composting latrines and sewer connections.

The SRF provided small loans (US\$145) over two years at partially subsidized rates to low-income and poor households for each 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 US\$6 subsidy on each loan. The loans covered approximately 65 percent of the average costs of a septic tank (US\$225) 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.

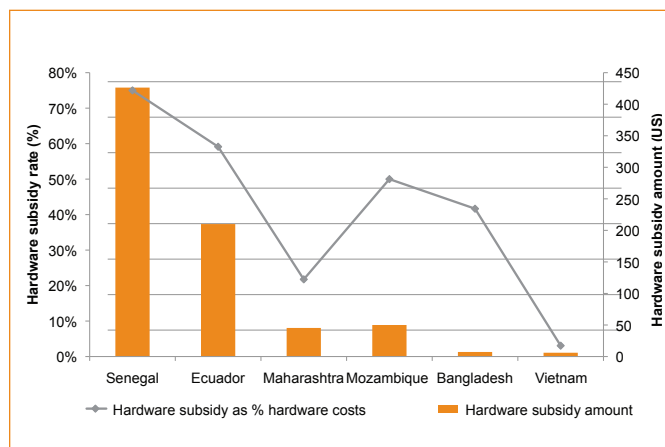
The program also included significant software support for sanitation promotion, the creation of Savings and Loan groups, and hygiene promotion. Software support per household was about US\$21 and represented about 10 percent of the total costs of sanitation adoption.

2.3 Hardware subsidy design

Hardware subsidies are defined as public funds provided to alter the price or costs of a particular good or service to encourage the output, supply, or use of these items. With respect to sanitation, hardware subsidies may be provided to encourage investment beyond the level that would be carried out based solely on private benefits and to reduce or eliminate the affordability constraint for poor households. Subsidies toward the costs of hardware were provided in all of the six cases reviewed; the delivery and targeting methods for these subsidies, however, varied significantly from one case to the next, as shown in Table 2.3 see page 21.

Figure 2.2 shows the extent to which the hardware subsidy covered the hardware costs as well as the amounts of hardware subsidy provided for those who received it.

FIGURE 2.2. HARDWARE SUBSIDY DESIGN



Note: For Bangladesh and Maharashtra, the figure shows the hardware subsidy for the households who qualified as poor and received a hardware subsidy. All other households received no hardware subsidy at all. As a result, the share of hardware subsidies as a percentage of public funds (as shown in Figure 2.2) is lower than the rate of hardware subsidy per eligible household.

TABLE 2.3. DESIGN OF HARDWARE SUBSIDIES IN THE CASE STUDIES

	What is subsidized?	How is the subsidy provided?	How much is subsidized?	How is the subsidy targeted?
Bangladesh	Costs of latrine construction for poor households.	In-kind to households. The village provides latrine construction materials to poor households free of charge.	Hardware subsidy for the poorest is equivalent to about US\$7 per latrine (42% of hardware costs).	Means-tested and community-led targeting: Lists of eligible hardcore poor are prepared by villages.
Ecuador	Costs of a basic sanitation solution for all households in project area.	In cash to the community. Paid up-front to the community organization, provided the community and municipality have paid their contribution.	Maximum subsidy is US\$210 per sanitation solution (59% of hardware costs), independently of the level of service chosen and actual costs of adopted solution.	Geographic targeting: All households in the project area (which is predominantly poor) can receive the subsidy.
Maharashtra	Costs of basic latrine construction for poor households.	In cash to BPL (below-poverty-line) households, after the village has reached ODF status (requires prefinancing).	Maximum subsidy is US\$ 24 per toilet (about 22% of hardware costs) from the Federal government (additional support from State possible).	Means-tested targeting: Lists of BPL households drawn up based on periodic surveys.
Mozambique	SanPlats and latrines for all households in project area.	Through transfers to PLM workshops (local producers of slabs and latrines) based on sales numbers.	Subsidy amounts fixed in 2000 at about US\$20 per latrine (about 19% of hardware costs). Amount not updated so public subsidy as percentage of costs has decreased with inflation.	Self-selection: All customers can benefit from the subsidy but the relatively low level of service serves as a self-selection criterion.
Senegal	Costs of a range of sanitation solutions for all households in project area.	In-kind to local entrepreneurs. The program finances construction of the sanitation facility following payment of the household contribution.	Subsidy fixed as 70% to 75% of hardware costs. Amount varies between US\$200 and US\$1,000 depending on the sanitation solution. These costs are set by a catalog of technical solutions.	Geographic and community-led targeting: Project operates in poor areas and CBOs assist to select potential beneficiaries.
Vietnam	Interest rate on loans for sanitation for all households in project area.	Households benefit from a subsidized interest rate on 2-year sanitation loans as well as a 6-month grace period on repayments.	Interest rate is half the market interest rate (with a six-month grace period). This gives an equivalent subsidy of US\$ 6 per loan (or 3% of hardware costs).	Geographic and community-led targeting: Project operates in poor areas not connected to the sewers. Loan applicants must request to join a local Savings and Credit group. The leader of this group assesses their ability to repay.

Senegal had the highest rate of hardware subsidy (the subsidy accounted for 75 percent of hardware costs on average), as can be seen from the figure above, and it also had the highest subsidy amount per household. In *Ecuador*, the subsidy amount was fixed at US\$210 per sanitation solution. This amount was set so that it would be equivalent to 70 percent of the costs of a basic sanitation solution. As the beneficiaries usually selected a higher service level, the actual construction costs were higher and the subsidy represented no more than 59 percent of construction costs (and in some cases less, although comprehensive information was not available).

In Bangladesh, hardware subsidies accounted for about 43 percent of investment costs for the households that actually received the subsidy. The number of households benefiting from such financial support was kept deliberately low (7 percent of households), consistent with the underlying philosophy of the CLTS approach to trigger a community response through mobilization (software activities) with no or only limited hardware subsidies. In the project area, hardware subsidies were provided by the government from the Annual Development Program (ADP) funds, which are funds transferred directly from the Ministry of Finance to local governments in the form of annual grants, 20 percent of which are earmarked for sanitation. Most of these funds are used to finance sanitation hardware subsidies for the poorest, on the assumption that a segment of the population needs financial assistance in order for the village as a whole to reach ODF status.

In Maharashtra, hardware subsidies for BPL (Below Poverty Line) households account for about 22 percent of hardware costs for those households and were provided to between 20 percent and 59 percent of households, depending on the district (there are no hardware subsidies for above-poverty-line households). According to the TSC guidelines, BPL households were supposed to fund only 20 percent of the latrine cost, as the federal government was supposed to cover 60 percent and the state government 20 percent of the latrine cost, respectively. However, as the subsidy was capped at Rs 1,200 (US\$24) and the average investment costs to BPL households in the study districts was Rs 5,500 (US\$110), the actual subsidy rate was much lower. This

was partly because actual costs tend to be higher than originally estimated, particularly in hilly areas and rocky terrain, but also because BPL households were willing and able to invest more than original estimates. Prefinancing support provided at the village level together with microcredit in certain districts helped make such levels of investment by BPL households possible.

In Mozambique, hardware subsidies were originally set between 42 and 57 percent, depending on the city and the relative rates of poverty, which yielded an average subsidy of 50 percent. These subsidy levels later went down as a proportion of the actual costs, since subsidy amounts have been capped since 2000 and have thus not kept up with significant inflation. In the Maputo workshop in 2008, for example, public hardware subsidies covered approximately 19 percent of actual hardware costs, although cross-subsidies from other workshop activities helped keep the price to households down.

In Vietnam, households benefited from subsidized interest rates, which were about half of market interest rates coupled with a six-month grace period (this translated into an annual interest rate of about 6.26 percent to be compared to about 12.87 percent based on market rates). In monetary terms, this built-in subsidy is equivalent to about US\$6 for a two-year loan or 3 percent of the hardware costs for customers. From the point of view of the public sector, it is more difficult to estimate the “cost” in public funds this subsidy represents, as such a calculation would require estimating the public opportunity cost of capital. The seed funds were provided as a grant from donors and were revolved rather than “used up” (given the high repayment rates of the program, these initial funds could be revolved several times). This means that even though each household received a small subsidy, the grant to the program as a whole must be taken into account.

2.4 Software support

Software support is defined in a broad way, to include both what are traditionally referred to as software activities (that is, training, community mobilization, sanitation promotion, and hygiene promotion, where any or all of these are provided) and overall program management costs, such as

TABLE 2.4. PROVISION OF SOFTWARE SUPPORT IN THE CASE STUDIES

	What software support is provided?	How is software support financed?
Bangladesh	<ul style="list-style-type: none"> • Support to local governments to scale up the CLTS approach • Sanitation promotion activities (rallies, campaigns, events, etc.) • Hygiene promotion • Project management, monitoring, and evaluation 	<ul style="list-style-type: none"> • Dishari project funds (75%) coming from a mix of NGOs • Government funds: financial rewards to villages for achievement of ODF status, percentage of funds transferred from central government to local governments, local government staff costs
Ecuador	<ul style="list-style-type: none"> • Institutional strengthening of small towns • Support for investment design • Project management, monitoring, and evaluation 	<ul style="list-style-type: none"> • Local project teams financed by the project support implementation. For example, they sign agreements with municipalities for transferring hardware investment funds.
Maharashtra	<ul style="list-style-type: none"> • IEC (information, education and communication) • Training and capacity building of TSC staff, motivators, and stakeholders • Support to microcredit institutions • Start-up costs to rural sanitary marts / production centers • Financial rewards, campaigns, prizes • Program management, monitoring and evaluation 	<ul style="list-style-type: none"> • Total Sanitation Campaign financed and managed at the central level • Financial rewards (NGP) paid from central government to ODF districts • State-level campaigns and clean village competitions transfer additional reward funds
Mozambique	<ul style="list-style-type: none"> • Originally: Training of masons, support to set up production workshops and demand promotion • All software activities have virtually ceased following withdrawal of donor support and decentralization 	<ul style="list-style-type: none"> • Software support was originally provided to establish and develop PLM workshops and to finance community animators or sales people for the workshops in charge of sanitation promotion • Such software support was heavily financed by external donors until decentralization (2002)
Senegal	<ul style="list-style-type: none"> • Hygiene promotion and communication • Community organization and supervision • Site supervision • Project management, monitoring, and evaluation 	<ul style="list-style-type: none"> • All software support transferred by Project Management Unit, which organizes sanitation promotion activities via CBOs
Vietnam	<ul style="list-style-type: none"> • Sanitation promotion • Hygiene education • Loan management and supervision • Loan management, monitoring, and evaluation 	<ul style="list-style-type: none"> • Portion of the grant funds were set aside to cover operating costs of the SRF, on top of interest revenues • Loan management done on a voluntary basis by Savings and Credit group leaders

staff, procurement, monitoring and evaluation, general overhead, and financial rewards where provided.¹² Software support may be provided to generate demand for sanitation and strengthen the supply chain to sell sanitation products to households. This broad definition of software was used to ensure that all costs were included, not only capacity building and promotional activities but also management costs. The use of such a broad definition was also driven by the fact that it was not always possible to obtain a detailed breakdown of how software costs were allocated between these different activities or to separate out management costs. Table 2.4 below shows how software support was provided.

Table 2.4 illustrates the wide range of software support activities that were funded. Most focused on community mobilization and sanitation promotion to generate demand for sanitation, and a few included a hygiene education component as well. Exact details of the software activities financed were not available, however, so it was not possible to disaggregate costs by software activity in order to compare the cost-effectiveness of different software strategies.

Approaches to financing software activities also varied. Some cases pulled in support from a variety of different sources (such as in Bangladesh, where donors, both international and local NGOs as well as the central government, were financing different activities). Others adopted a more centralized approach, such as in Senegal, where all software activities were financed via the World Bank-funded

project.

A particular feature of the Maharashtra and the Bangladesh cases is that in both cases, the central governments provide financial rewards to the villages that have achieved ODF status or are 100 percent sanitized (depending on the definition used, the first one being more focused on outcome and the second one on latrine construction).

In Bangladesh, the reward money comes with no strings attached and may be used for any kind of development work in the village, such as road construction. An associated, non-monetary, incentive comes in the form of a certificate granted by the Local Government minister to the chairman of each village that achieves ODF in a ceremony that seems to act as a strong motivator for local politicians.

In Maharashtra, by contrast, NGP (Nirmal Gram Puraskar) awards are cash incentives, paid by the central government to the qualifying districts, that must be utilized for improving and maintaining sanitation facilities in the districts. The monitoring process is much more rigorous with independent reviews to guarantee that the villages have met all qualifying criteria (including 100 percent sanitation coverage of individual households and 100 percent school sanitation coverage, totally free from open defecation, and maintenance of an overall clean environment, including solid waste management). In addition, yearly campaigns, such as the Clean Village campaign (SGBSA), define yearly activities that help maintain cleanliness standards.

12 See Annex G for a list of all potential software activities. In the case of Maharashtra, software support financial rewards provided to villages as a whole were included in software support rather than hardware, as they are used for general sanitation improvements (and do not benefit the households directly).

III. Evaluating the performance of financing approaches

This section compares the performance of the financing approaches in the six case studies using common evaluation criteria (see Table 1.2).¹³ Only the most relevant points are highlighted in the text. For further detail and analysis, refer to Annexes A to F containing the summary country case studies. Each country annex contains a summary evaluation identifying those aspects of the financing approach that seem to have worked and those that seem not to have worked for each of the cases under review.

3.1 Impact on sustainable access to services

The first set of indicators seeks to evaluate the relative impact of the projects on sustainable access to services, based on whether access to sanitation increased and was sustained over time

This series of indicators seeks to evaluate whether, overall, the projects have made a substantial contribution to increasing sustainable access to sanitation. This evaluation is broader than that of the financing approach *per se*, although it indicates whether or not the financing approach was successful at triggering investments. The impact of the projects on access to services was first evaluated in terms of the number of sanitation solutions built (the total number over the length of each project and the number per year, in order to adjust for differences in program lengths) and the attributable increases in coverage

rates in the project areas. Table 3.1 shows the ability of the projects to increase coverage overall and on a yearly basis.

All projects triggered significant investment when placed in their respective country contexts.

Comparisons in terms of the number of people served are biased by the fact that the TSC program in the State of Maharashtra is a massive campaign in a densely populated state. Over the course of four years, the TSC managed to motivate more than 20 million people to gain access to sanitation throughout rural *Maharashtra*, which is equivalent to incentivizing the construction of more than one million sanitation facilities per year. This led to a 38 percent increase in coverage throughout the State (and more than a 60 percent increase in some of the districts reviewed).

The second best performing approach in terms of number of facilities built per year was the Dishari project in *Bangladesh*, where 81 percent of the villages in the project area achieved Open Defecation Free (ODF) status over the course of four years. This resulted in a 70 percent increase in coverage (measured by the Government of Bangladesh definition, which does not always qualify as access to improved sanitation as per the JMP definition). Given that some of these latrines are shared, the total population benefiting from improved access is likely to represent

TABLE 3.1. NUMBER OF PEOPLE SERVED DURING EACH PROJECT'S LIFE AND FACILITIES BUILT PER YEAR

	Maharashtra	Mozambique	Bangladesh	Senegal	Vietnam	Ecuador
Population in project area	55,780,000	8,300,000	2,361,000	1,695,000	1,303,000	515,000
People served by project	21,200,000	1,888,000	1,631,000	366,000	194,000	141,000
Facilities built / year	1,050,000	13,447	90,596	21,183	6,615	6,281
Attributable coverage increase	38%	29%	70%	22%	15%	27%

¹³ Such comparisons are difficult to carry out conclusively, as many factors may determine the relative success of a project or program aside from its financing approach. For example, when software subsidies are used to generate demand for the service, the quality and the impact of such demand-promotion activities may vary widely from program to program even if the costs are the same.

an even higher percentage, while hygiene education activities reached all of the population in the project area.

In *Mozambique*, the PLM led to the construction of just under 365,000 improved latrines since the inception of the program in the early 1980s, which means that all people served through an improved latrine in urban Mozambique obtained access through the PLM. This represents about 1.8 million people or about 29 percent of the urban population. On a yearly basis, the speed of program implementation was much slower than for other programs, however, and the results varied widely over time depending on changes in program design (see Annex D). The interruption of software support to finance community animators in charge of promoting the latrines led to a sharp reduction in uptake.

In *Vietnam*, the SRF helped almost 200,000 households build sanitation facilities over the course of 7 years, which resulted in increases in coverage of between 13 percent and 21 percent depending on the town compared to the baseline population. Achievements have also been significant in *Senegal* and *Ecuador*. In *Senegal*, the program covered approximately 22 percent of the population in the project area, with the construction of about 63,000 sanitation solutions benefiting about 40,000 households in about three years, two years ahead of schedule. In *Ecuador*, the project was successful at delivering attractive sanitation solutions to about 30 percent of the population in its project area, with the construction of about 29,000 sanitation solutions over 4.5 years.

Overall, sanitation facilities built through the projects appeared to be used and well-maintained. Numerous factors influence the long-term sustainability of household sanitation investments, including as the extent to which software was maintained over time, the acceptability of the types of latrines built, overall macroeconomic conditions. While the financing approach is only one such factor, it may influence sustainability in two main ways. On the one hand, facilities built with substantial household investment may be more sustainable, since households care to maintain what they see as their own property. On the other hand, facilities can only be adequately maintained if the associated operating and maintenance costs are not too expensive with respect to household incomes.

Unfortunately, few of the projects had precise data with which to monitor the operation, maintenance, and use of sanitation facilities built through the projects a few years after construction, yet such data are essential to assess the sustainability of these initial investments. In addition, it was not possible to investigate all the factors affecting sustainability, so any analysis of sustainability would be unable to control for such factors.

Anecdotal evidence gathered in the case studies indicated that, for the most part, the latrines were put to good use, well-kept and, in some cases, upgraded over the years. In *Bangladesh*, a WSP study concluded that 82 percent of latrines in Bangladesh (including in the Dishari project area) showed physical evidence of maintenance.¹⁴ In *Maharashtra*, initially temporary superstructures have been upgraded to more permanent structures over time. Since the financing approach in Maharashtra only subsidizes a basic latrine for the poorest households, any subsequent improvements reflect a true demand from their owners to upgrade their facilities as their economic condition allows.

In *Vietnam*, several streams of observation concurred that all facilities built with revolving fund financing were still operating five years after construction, reflecting strong ownership of the scheme. Even in *Ecuador*, research showed much greater willingness by the communities to maintain the projects when they had been required to contribute their own resources compared to projects that had been fully financed through grants. This seems to support the first assumption stated above, that a higher share of household participation in covering the initial costs leads to good sustainability. In *Senegal*, however, high rates of maintenance were also observed, despite having the highest rate of hardware subsidy (70 percent to 75 percent). In *Senegal's* case, the fact that the household's contribution still represented a substantial portion of income meant that ownership of the facilities was also strong.

Finally, latrines built through the projects were, on the whole, observed to be well maintained. This indicates that operating costs were sufficiently low that households could afford them without external subsidies (see Section 3.2 for information on operating costs).

¹⁴ WSP 2006.

In almost all cases, there was no reliable information as to whether the latrines, once full, had been emptied or moved. For all projects, it was not possible to assess whether the households that had benefited from public financial support to build a latrines were then able and willing to pay for the costs of moving the latrines several years later when they become full. In some cases, the investments were relatively recent, so the need to empty the latrines had not yet materialized.

In *Mozambique*, a study was carried out where the program had been running for the previous 17 years. The study found that more than 70 percent of improved latrines were still in use and that a significant number of slabs had been moved to replacement pits or that the pits had been adapted to water-flushed systems.

Overall, the dearth of data on sustainability indicates that insufficient monitoring is carried out to ensure that the latrines, once built, can be emptied or moved so as to ensure sustainable sanitation.

Concerns were expressed related to the sustainability of the investments triggered by the financing approaches in Maharashtra and Bangladesh, which both use financial rewards for incentivizing communities and villages to install latrines and eliminate open defecation. In *Bangladesh*, it appears that some villages were declared sanitized when in fact not all households had installed a latrine. The absence of a third-party verification system and the financial rewards associated with meeting the objectives means that over-reporting is a risk. In *Maharashtra*, this risk was minimized through the introduction of yearly cleanliness campaigns, which have acted as an ongoing monitoring mechanism beyond the one-off NGP assessment.

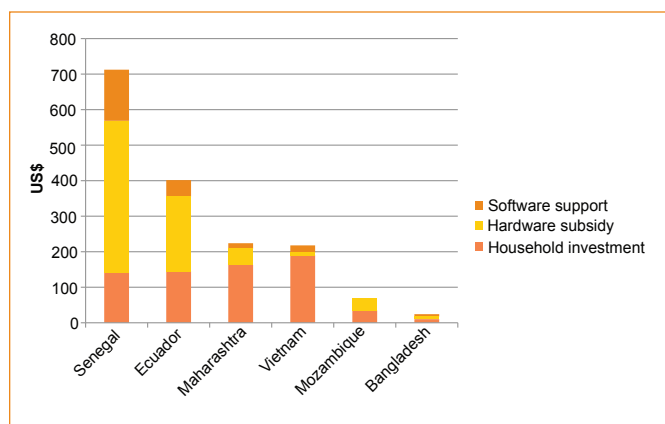
3.2 Costs

The second set of indicators examines whether the financing approach triggered investment at a reasonable cost, especially at a cost that is affordable when compared to household incomes

The average costs of providing household sanitation were computed by taking account of all the costs (including software) and all the sources of finance.¹⁵ Results are summarized in Table 3.2 below.

Figure 3.1 shows the average initial costs of the sanitation “package” that households accessed in each of the case studies and breaks down the initial hardware costs between the hardware subsidy component and the household investment component. This figure shows substantial differences in the initial costs of accessing sanitation, reflecting a number of factors as discussed below.

FIGURE 3.1. TOTAL INITIAL COSTS PER HOUSEHOLD (ACTUAL US\$ EXCHANGE RATES)



Note: For Senegal, the average costs were calculated by dividing the total costs of providing on-site sanitation facilities by the number of households reached, to reflect the fact that households served received 1.56 facilities on average.

TABLE 3.2. INITIAL COSTS AND OPERATIONS AND MAINTENANCE COSTS (US\$)

	Senegal	Ecuador	Maharashtra	Vietnam	Mozambique	Bangladesh
Hardware costs / solution	\$568	\$355	\$208	\$197	\$70	\$17
Software support / solution	144	46	15	21	n.a.	7
Opex / solution / year	138	73	4	31	n.a.	5

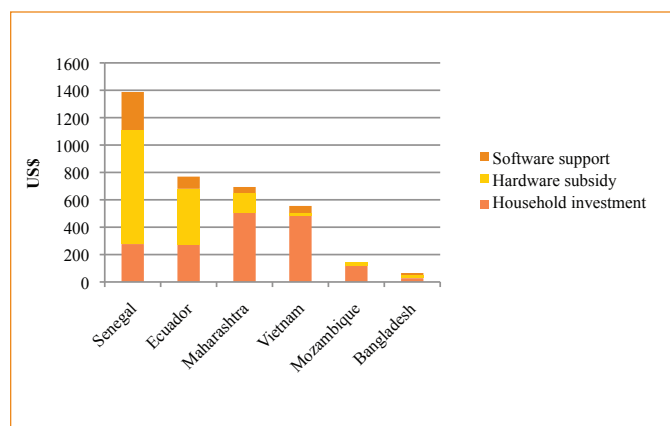
Note: Country case study annexes include more detail on the exchange rates used.

15 Note that the initial development costs, i.e. the costs of designing and preparing the projects, are not included.

Carrying out international cost comparisons is complicated by the need to choose a common currency to express costs. On the one hand, the costs being compared have been incurred at different points in time, in countries where inflation is often significant. This was the case for Vietnam, where costs incurred in earlier periods were adjusted for inflation. In the case of Mozambique, although the program was examined over its entire life (since the late 1980s), cost information was only obtained for 2007, which means that required inflation adjustments were minimal.

*Differences in costs due to exchange rate conversions can be controlled for using PPP exchange rates.*¹⁶ Actual exchange rates can give a distorted picture, as currencies may be over-valued or under-valued against the US dollar. This issue can be partially overcome through using purchasing power parity (PPP) exchange rates to compare costs and prices across countries, as shown in Figure 3.2.

FIGURE 3.2. TOTAL INITIAL COSTS PER HOUSEHOLD (PPP US\$ EXCHANGE RATES)



Using PPP exchange rates does not alter the ranking of the cost comparisons, however. In PPP terms, Senegal still has the highest costs in the set of case studies, reflecting the fact that the local currency, the CFAF, is pegged to the Euro and tends to be overvalued compared to other local currencies in countries with similar incomes. Costs for Ecuador, Maharashtra, and Vietnam are brought closer together, while those in Mozambique and Bangladesh remain much lower than for the other cases.

BOX 3.1. USING PURCHASING POWER PARITY (PPP) INDICATORS FOR COMPARING PRICES ACROSS COUNTRIES
 PPP exchange rates equalize the purchasing power of different currencies in their home countries for a given basket of goods. Basing cost comparisons on a PPP exchange rate rather than on a market rate is arguably more useful as it allows taking into account the relative cost of living and the inflation rates of different countries, rather than just a nominal comparison. However, estimation of purchasing power parity is complicated by the fact that prices from country to country do not differ in a uniform way. Rather, the difference in food prices may be greater than the difference in housing prices while also being less than the difference in entertainment prices. People in different countries typically consume different baskets of goods, purchasing patterns are different, and even the goods available to purchase differ across countries.

Sources: Krugman and Obstfeld 1994; http://en.wikipedia.org/wiki/Purchasing_power_parity

These substantial cost variations largely reflect the different levels of service provided by different projects. Table 3.3 shows the levels of service that households obtained through each project, from highest to lowest. Ecuador is at the top of the list, as it provided the highest level of service with a basic sanitation unit comprising a toilet connected to a septic tank, a sink and a shower. Similarly, in Senegal, households received a comprehensive service (and usually more than one sanitation facility, including washing facilities). At the other extreme, only basic latrines were built in the Dishari project area of Bangladesh, some of which did not comply with JMP standards).¹⁷

Although the primary driver of cost differences is service level, the choice of financing approach also appears to have a substantial impact on cost. As shown in Table 3.3, costs appear to be primarily driven by service levels. The choice

16 There are issues with using PPP exchange rates, which can introduce other types of distortion (as discussed in Box 3.1). For this reason, cost information in the rest of the report is presented using actual exchange rates.
 17 See Annex G for more information on alternative levels of service for on-site sanitation

TABLE 3.3. LEVELS OF SERVICE AND FINANCING APPROACHES (US\$ ACTUAL EXCHANGE RATES)

Case studies	Levels of Service	Average hardware costs per household (US\$)	Percent investments from the public sector	Percent hardware subsidies out of public funds
Ecuador	Mostly basic sanitation units (UBSs), consisting of a shower, a sink, and a toilet connected to a septic tank.	\$355	85%	86%
Senegal	Range of technical options. On-site sanitation ranges from dry solutions (VIP latrines) to wet solutions (septic tanks or pour-flush toilets). Average costs include 1.56 facilities (which may include a latrine and a washing facility).	568	89	77
Vietnam	Mostly latrines with septic tanks.	197	7%	30%
India	Improved latrine (with no required standard) – Particular emphasis on twin-pit leach pit with pour-flush design.	\$208	9%	71%
Mozambique	Improved latrines with a domed slab and concrete blocks lining the pit.	70	58	22
Bangladesh	Basic latrines, no model specified, but typically pour-flush pit latrines with up to three concrete rings.	17	31	8

Note: In most cases, households were given the choice in terms of what to invest in, which means that service levels could also vary considerably within each case study. Due to a lack of data, it was not possible to disaggregate the hardware costs to compare the costs of a basic sanitation solution across the different case studies.

of service level is integral to the overall program design. It is driven by a number of factors that are usually independent of the financing approach, including cultural factors, expectations, acceptability, and affordability. The choice of sanitation service level is particularly dependent on the type of water services provided. In Ecuador, for instance, the expected level of service for water is a piped connection, which means that dry latrines would not be satisfactory, nor would they be accepted given that there are high expectations in terms of service level, including in poor rural areas.

As a result, it is not possible to establish a direct causality between the financing approach and the choice of service level. On the whole, the higher the level of service, the higher public subsidies are as a percentage of the total costs of sanitation adoption. There are important exceptions to that observation, however. In both Vietnam and Maharashtra, the service levels retained are relatively high, although public funds represent a small percentage of total costs (7 percent and 9 percent respectively). This may be because the financing approaches in both cases were particularly effective at leveraging household investments (see Section 3.3 for more details).

In Senegal, the average hardware costs per household were estimated at US\$568, which is more than 1.5 times the costs in Ecuador and more than three times the costs everywhere else. Comparatively higher costs in *Senegal* may be due to a number of factors, including technical ones, as well as the choice of financing approach. These costs per household are high because, on average, each household targeted by the project received 1.56 sanitation solutions, some of which were washing facilities, although this was also the case in Ecuador with the UBS which represents, on the whole, a higher level of service. On the technical side, the water table in the Dakar area is high, which means that soil conditions are unstable and it can be more expensive to build latrines, as substantially more building material is required as a lining for the pit and a foundation for the latrine. This cannot explain all cost differences, however; other countries have other factors driving up costs. In Ecuador, for example, the costs of transporting building material are significant as the program reaches remote rural areas.

These higher costs in Senegal may also be due to the choice of financing approach. The program in Senegal is highly subsidized, with 89 percent of the total initial costs of

adopting sanitation coming from the public sector. This is still a reduction in subsidy from previous sanitation schemes in the country, where costs of other NGO-led programs are usually 100 percent subsidized. High subsidy levels are likely to have created some perverse incentives. Local entrepreneurs, used to generous subsidies, are less willing to bring prices down to increase their market share. Potential recipients are unlikely to invest themselves if they know large subsidies are available, and therefore do not apply pressure for price reductions.

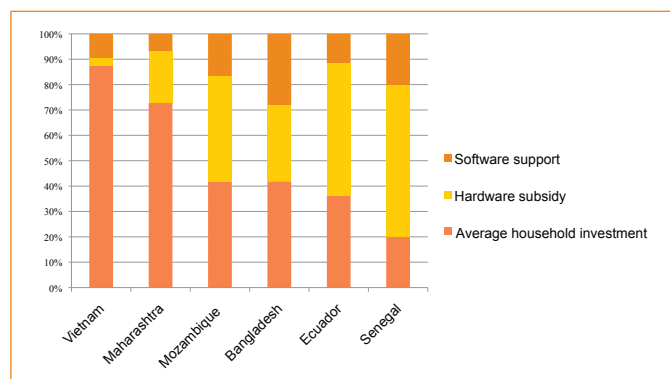
The project proposes a catalog of prespecified technical solutions. The beneficiaries choose among those solutions (and they usually chose the cheapest options), but for each choice they have to accept the technical standard set by the project. While this may improve the robustness and durability of the installations, it does not allow households to save on costs, for example by using recycled materials, or to negotiate prices with entrepreneurs. Conscious of this risk, program designers sought to negotiate prices of the catalog of services down in several instances, as the initial costs received from local entrepreneurs were even higher. A subsequent extension, financed with GPOBA subsidies, sought to reduce the prices even further by applying competitive pressure between entrepreneurs. Despite these attempts, costs have remained high, showing the limitations of centrally procured, highly subsidized sanitation schemes. Given that subsidies are defined as a percentage of the hardware costs, this approach has been expensive for the public sector (see Section 3.3 for more details).

Initial costs were also relatively high in *Ecuador*, where most households elected to invest in a UBS, with a latrine connected to a septic tank, a sink, and a shower to meet all of the household's hygiene needs. The estimated average hardware cost of these investments was approximately US\$355 (plus US\$46 for software costs), which was considerably higher than the fixed hardware subsidy provided by the project (US\$210). In this case, households were willing to invest in a higher level of service that clearly met a real demand. Placing a cap on the subsidy thus helped limit the impact on the public purse while allowing the level of service to vary to meet differing local demands, which households were willing to pay for.

At the other end of the spectrum, the initial hardware costs in *Bangladesh* were the lowest, at US\$17, to which must be added US\$7 (or 28 percent of the latrine cost) for the software component. In this case, the households decided on the type of latrine, depending on what they could afford. Most of the latrines built in that way were simple pour-flush latrines with three or more concrete rings to line the pit and a basic superstructure made of locally available material. One potential drawback of this approach is that latrines built cheaply may be more expensive to maintain. The focus on capital costs may encourage a false economy of building "a cheap latrine" that is more affordable to build. For example, if the pit is relatively shallow, it would inevitably fill up more quickly, necessitating either more frequent emptying or earlier relocation of the latrine. This risk is partly confirmed by comparing Bangladesh with *Maharashtra*. In the latter, households, including a substantial number of above-poverty-line (APL) households, built improved latrines at a much higher initial cost than in Bangladesh but with comparable or even lower operating costs. Indeed, operating costs represented 29 percent of the initial costs in Bangladesh, which was the highest percentage in the set, as opposed to 2 percent in Maharashtra and 16 percent in Vietnam. These perverse incentives for households can be reduced through the use of microfinance, as was done in some districts of Maharashtra, which allows the costs of a more expensive latrine to be spread over time, instead of building a cheap one that would not last or would be more expensive to maintain.

The "software support" premium per household varies considerably. We did not have sufficient data to draw firm conclusions about the effectiveness of software support. Software support costs represented a varying proportion of total initial costs. Figure 3.3 shows how these costs were allocated between household investment, hardware subsidy and software support for those households that received a hardware subsidy.

FIGURE 3.3. ALLOCATED INITIAL COSTS PER HOUSEHOLD



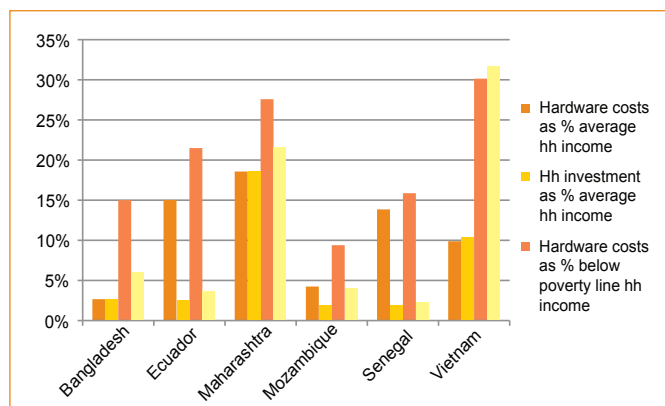
Note: these percentages apply to those households that did receive a hardware subsidy.

Variations in software costs are difficult to explain because it was not possible to disaggregate the software costs into their different components. In particular, it was not possible with existing project documentation to distinguish between software activities (such as demand promotion and sanitation marketing) and project management costs.

Software costs as a percentage of total initial costs may give some indication of the relative effectiveness of the different schemes, however. Figure 3.3 shows that the “software support” premium ranged from 29 percent in Bangladesh (the highest figure, as a percentage of total initial costs) down to 7 percent in Maharashtra, even though in US\$ terms, software support costs were twice as high per household in Maharashtra relative to those in Bangladesh. Software programs entail some fixed costs, which do not vary with the type of investments being promoted, particularly when international donors and NGOs are involved. For example, in Bangladesh, the Dishari project (funded by international donors and NGOs) supports the implementation of the Government of Bangladesh’s policy, and aims to build local government capacity to lead the promotion of CLTS. As a result, in the short term, direct project costs come on top of indirect governmental capacity-building costs, on the assumption that once trained, the local government officials can maintain ODF achievements. By contrast, the TSC in Maharashtra is run directly by the Government of India and the State of Maharashtra, at a much lower cost in proportion to the total investment costs.

When compared to household incomes, hardware costs represented anything from 2.7 percent of average income in Bangladesh to just over 30 percent of income for BPL households in Vietnam. Both the initial costs (the hardware and software support costs) and the ongoing operations and maintenance costs were estimated as a percentage of household income, for average households and poor households, based on the national poverty line in each country. Figure 3.4 shows hardware costs as a percentage of income for average and BPL households in each of the project areas. This is a more reliable way to compare financing approaches and evaluate whether the resulting costs are “reasonable” in each country, that is, whether they are affordable to the population, as it avoids differences due to exchange rate factors.

FIGURE 3.4. HARDWARE COSTS AND HOUSEHOLD INVESTMENT AS PERCENTAGE OF HOUSEHOLD ANNUAL INCOME



Contrary to what is commonly accepted, data from the case studies suggests there is a significant demand for sanitation, with people willing to invest a significant percentage of their income into on-site sanitation facilities, as was the case in Maharashtra, Vietnam, Ecuador and Bangladesh.

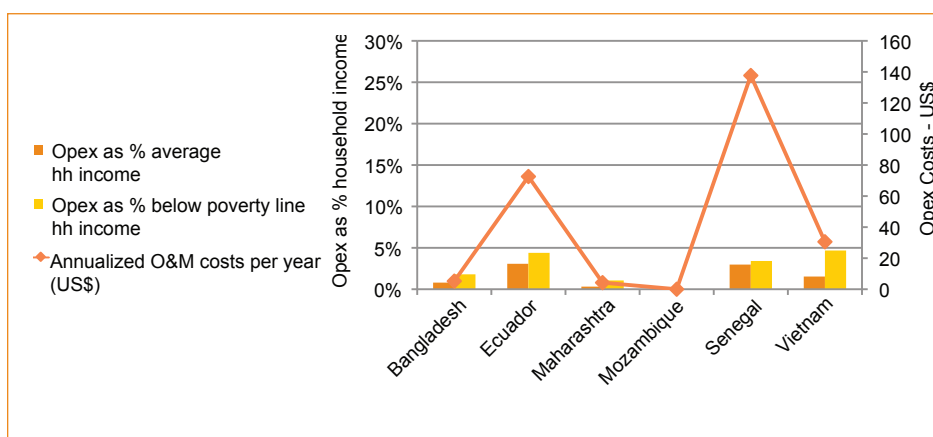
In *Vietnam*, for households below poverty line (who were the target group for the project), investment in a septic tank could account for up to 30 percent of their annual income. Spreading this cost over two years via the loan enabled them to make such a sizeable investment, as the loan catalyzed other forms of finance, such as loans from relatives. The total cash outlays for these households were slightly higher than the hardware costs, as they had to pay interest on the loan.

In *Bangladesh* and *Mozambique*, hardware costs represented a much lower percentage of household incomes, which partly reflects the fairly low levels of service deliberately set to enhance affordability. The subsidy provided to BPL households substantially reduced the impact on household incomes of building a latrine. As shown in Figure 3.3, the subsidy reduced household investment from 15 percent to 6 percent of income for those households.

In *Senegal* and *Ecuador*, hardware costs represented more than 20 percent of income for BPL households, i.e. for those targeted by the programs. When taking into account the substantial subsidy, however, the investment cost to the poorest household (their cash contribution) dropped to 3.4 percent and 3.7 percent respectively, which partly explains why there was such a high demand for relatively expensive and tightly defined investments. However, data from the other case study countries indicate that household investments would be possible with a lower level of subsidy, as households appear able to invest a higher percentage of their income.

There are substantial differences in operating costs per sanitation solution per year, with Senegal being the most expensive and Bangladesh the cheapest. Operations and maintenance costs per sanitation solution per year were estimated by taking account of the costs required to maintain the latrine clean, access it in a hygienic manner (incorporating the cost of sandals and cleansing material) and empty it every three to four years.¹⁸ These estimated costs, shown in Figure 3.5 were based on the assumption of adequate operations and maintenance. There may of course be circumstances in which households would save on such expenditures to preserve cash and thereby run the risk of deterioration of the latrine. However, evidence of good latrine maintenance (see Section 3.1) seems to indicate that households are willing and able to pay for such expenses, or that they carried out some of the basic maintenance activities themselves as a way of economizing.

FIGURE 3.5. OPERATIONS AND MAINTENANCE COSTS PER SANITATION SOLUTION PER YEAR (US\$)



In all countries, operating costs were kept below the 5 percent mark (including for the hardcore poor), which tends to indicate that the service provided was affordable to the local population. For example, latrines in *Maharashtra* and *Bangladesh* share the common characteristic that they are cheap to operate and therefore eminently affordable for households (although, in the case of Bangladesh, operating costs account for 30 percent of initial costs for poor households, which indicates that savings may be achieved by building more solid latrines in the first place, as discussed above).

3.3 Effectiveness in the use of public funds

The use of public funds was evaluated to examine how effectively it maximized impact.

The evaluation of the effectiveness in the use of public funds is based on two main indicators: the number of households that obtained access to sanitation per US\$1,000 of public funds spent, referred to as the *increased access/public funding ratio*, and the amount of private funds invested (in US\$) for each dollar of public funds used, referred to as the *leverage ratio*.

Table 3.4 shows the estimated total costs of on-site sanitation adoption at the household level in the project areas, as well as the breakdown between public funds and household investment. The table also shows the increased access/public funding ratio, the leverage ratio, and potential explanatory factors for these two indicators.

18 The present study did not have the means to carry out an extensive survey of operating costs.

*The increased access/public funding ratio showed great variations, as US\$1,000 could help serve 135 households in Bangladesh but only 1.6 in Senegal.*¹⁹

The increased access/public funding ratio, as shown in Table 3.4, captures a number of parameters, including the initial costs of the facilities, the size of the hardware subsidy and the level of software support. Given the way this indicator is estimated, the lower the costs (and usually the service level) of the facilities, the higher the ratio. A comparatively rich country such as Ecuador could afford a relatively expensive approach to expanding coverage with high levels of service, and given the population's expectations, a lower level of service would not be acceptable and would be doomed to fail. Yet, given that most countries have funding limitations, it is useful to track this indicator in order to measure the effectiveness of public interventions in the sector. For example, the approach adopted in Senegal, which is barely above Bangladesh in terms of PPP-adjusted GDP per capita appears to be too expensive when considered with regard to households' financial means.

The ability to leverage household investment varied substantially, ranging from a leverage ratio below 1 in Ecuador, Mozambique, and Senegal to a ratio of almost 20 in the case of Vietnam. The ability to leverage private investment can be critical to maximize results from limited available public

funds. It is therefore important to improve our understanding of which financing approaches can be successful at leveraging household investment. In the programs under review, a number of low hardware subsidy programs appeared capable of leveraging substantial household investments to achieve large gains in coverage.

Other important aspects include the effectiveness of the demand-creation component, financed through software support, which can influence willingness to invest in sanitation. Household income may also influence the willingness to pay. For this reason, the amount of software support and average household incomes for BPL households are shown in Table 3.4. It was difficult to identify clear relationships between those factors, however.

In *Vietnam*, the leverage ratio varied from one city to another and also from one type of investment to another investments included septic tanks, urine diverting/composting latrines and sewer connections. The leverage ratio was particularly high with this financing approach, because public funds were provided mostly in the form of seed money for the revolving funds, which were revolved about twice during the first phase of the project (2001 to 2004) and further in later phases. Between each phase, the funds were transferred with minimum reduction in the original capital pool, thanks to low operating

TABLE 3.4. COSTS OF ON-SITE SANITATION AND EFFECTIVENESS OF PUBLIC FUNDS

	Bangladesh	Ecuador	Maharashtra	Mozambique	Senegal	Vietnam
Total estimated costs (public and private) of providing household sanitation (US\$ million)	\$8.8	\$11.3	\$940.7	n.a.	\$28.9	\$5.4
Total public funds spent on household on-site sanitation (US\$ million)	\$2.7	\$9.6	\$83.2	n.a.	\$25.7	\$0.3
Total household investments in sanitation (US\$ million)	\$6.0	\$1.7	\$857.5	n.a.	\$3.2	\$5.0
Increased access/public funding ratio*	135.1	2.9	50.5	n.a.	1.6	116.8
Leverage ratio**	2.27	0.18	10.30	0.87	0.13	19.92
Hardware subsidy as % of hardware costs	42%	59%	22%	50%	75%	3%
Software costs as % costs per solution	28%	12%	7%	n.a.	20%	10%
Average income for BPL households (US\$/year)	\$290	\$1,652	\$400	\$741	\$897	\$574

* Number of sanitation solutions per US\$1,000 of public funds invested.

** Household investment/Public investment. A high ratio indicates the ability to leverage private funds.

Note: In *Vietnam*, donors initially allocated US\$3 million to the revolving fund as seed money. As these funds were revolved several times with minimal reduction, Table 3.4. shows only the amounts of public funds that were "used up."

19 If the analysis was done in terms of number of facilities built, the ratio went up to 2.5 in Senegal per US\$1,000 given that households received more than one facility on average.

costs (some of which were covered by interest proceeds) and extremely high repayment rates (virtually 100 percent throughout). The sanitation component also benefited from being part of a larger sanitation project with substantial awareness-raising and demand-generation activities. The costs of these activities carried out through the broader project have not been taken into account as it was not possible to allocate them reliably to the Sanitation Revolving Fund component.

In *Maharashtra*, the TSC was able to leverage substantial private investment, particularly from APL households, which did not receive any hardware subsidy and invested up to almost 40 times the amount of public funds that had been spent on the campaign in their area. The study district that had the highest leverage ratio overall (27.7) was also the only district where there had been an organized initiative to link households with credit institutions. In that case, credit provision seems to have accelerated the take-up rate and leveraged additional household investment.

Leverage ratios were lowest in the two programs with high hardware subsidies provided to all households, namely Ecuador and Senegal. In Senegal, difficulties in mobilizing household investment can be attributed to a number of factors, including the relatively high cost of the sanitation solutions on offer, which represented a high share of the local population's income, the lack of credit facilities, and a history of highly subsidized schemes, which created expectations about receiving a subsidy.

3.4 Poverty targeting

The effectiveness of the programs at targeting the poor was evaluated based on the targeting criteria used at the program design stage and available evidence on actual targeting results. Whereas the approach to targeting was usually clear, evaluating the effectiveness of these approaches proved to be very difficult given that the necessary data were usually not available at the project level.²⁰

All the programs sought to target poor households, except the PLM in Mozambique, which did not do so explicitly. This

may partly be a reflection of the Mozambique program's relatively long history, since it started during the civil war when the country as a whole was extremely poor and the administrative system was not sufficiently developed to implement a targeting system.

The programs used a range of targeting mechanisms to achieve their pro-poor objectives, including geographical targeting (identifying poor areas where all households are considered to be poor), means-based targeting (where poor households are identified based on a number of criteria), self-selection (where the project offers a service level that would only appeal to poor customers), and community-led targeting (where members of the communities agree between themselves on who can receive a subsidy).²¹ On the whole, it appears that the programs were effective at reaching their target recipients, although there was significant subsidy leakage in some cases. Table 3.5 summarizes this evaluation.

Geographic targeting consists of offering the subsidy only in certain areas, where the project or program was active. This approach was used in all of the donor-financed projects, that is in Senegal, Ecuador, and Vietnam, as well as in Bangladesh to some extent (the Dishari project was mostly active in extremely poor areas as well as in one relatively affluent district, used as a comparator).

In *Senegal*, several targeting methods were evaluated at the design stage for water as well as sanitation services, and it was deemed that regional targeting would be most cost-effective given the costs of alternative methods. Regional targeting meant the subsidy was available to everyone within the project area, as long as they were willing and able to pay their up-front contributions. Errors of inclusion with such methods can be minimized when the selected areas are poor in a homogeneous manner, such as urban slums with no sewer connections (as in Senegal) or remote rural areas (as in Ecuador).

Means-tested targeting consists of identifying poor households based on a series of poverty indicators. Such a targeting method was used in government subsidy programs, such as in

20 Common ways of measuring the effectiveness of poverty targeting consist of evaluating errors of inclusion (when relatively well-off people find themselves benefiting from subsidies) and errors of exclusion (when members of the target group are not captured by the eligibility criteria) associated with the targeting mechanism. See for example: Komives et al. 2005.

21 The costs of alternative targeting mechanisms are an important factor to take into account when designing the financial approach. In the case of Senegal, the costs and benefits of alternative targeting mechanisms for subsidized water connections have been extensively reviewed. In that case, it was concluded that regional targeting was the most cost-effective solution.

TABLE 3.5. TARGETING MECHANISMS AND OBSERVED OUTCOMES

	Approach to targeting	Targeting results
Bangladesh	<ul style="list-style-type: none"> Project areas were among the poorest in the country (except Gazipur district, selected as a “control” district). Government hardware subsidies were targeted to poor households, based on strict eligibility and exclusion criteria. Community-level mechanisms in Dishari project area were used to improve targeting, with communities deciding who could receive subsidy. 	<ul style="list-style-type: none"> Many nonpoor benefited from the Government hardware subsidy outside of the Dishari project area (20% to 50% in some cases, although based on a limited sample). In the Dishari project area, community involvement improved targeting significantly. Government hardware subsidies reached about 7% of households in the project area.
Ecuador	<ul style="list-style-type: none"> Targeted small towns (below 10,000 inhabitants) in poor areas around the country. All households were deemed eligible for hardware subsidy within the target area. 	<ul style="list-style-type: none"> Poor areas were served through the project. No evaluation of errors of inclusion and exclusion was available.
Maharashtra	<ul style="list-style-type: none"> TSC was active in all rural districts, not only poor ones. Targeted hardware subsidies to BPL households were identified through national surveys. 	<ul style="list-style-type: none"> About 5% to 10% of people who received the subsidy were not genuinely eligible. About 10% to 20% of poor families did not receive the subsidy, due to problems with the methodology for identifying the poor. Some local governments alleviated exclusion errors by providing direct support to poor families.
Mozambique	<ul style="list-style-type: none"> No explicit poverty targeting. Implicit targeting as the PLM workshops produced a simple latrine, which did not appeal to comparatively richer households. 	<ul style="list-style-type: none"> No explicit analysis of the impact of the program on poor households. All improved latrines were deemed to have been built via the program, whereas richer households built septic tanks.
Senegal	<ul style="list-style-type: none"> Targeted the poorest areas of Dakar and its surroundings, CBOs helped with identifying poor households most in need. 	<ul style="list-style-type: none"> Limited error of inclusion: Few comparatively richer households benefited from the program during the pilot phase.
Vietnam	<ul style="list-style-type: none"> Targeted poor households in areas not connected to the sewers. Savings and Loans group leaders selected loan recipients, based on needs, reputation, and ability to repay. 	<ul style="list-style-type: none"> All beneficiaries were in the bottom 20% in income level. Those who were not deemed able to repay were excluded (mostly indigent people).

Bangladesh and Maharashtra, where poverty is widespread rather than contained in specific areas. In the case of Maharashtra, for example, poor households were identified through regular central government surveys for the purposes of broader poverty targeting programs. There are well-known problems with the methodology used for identifying poor households, however. In 2003, the Government of India introduced a new methodology for poverty classification which has been heavily criticized; some felt that it introduced too stringent exclusion criteria (for example, ownership of a ceiling fan is enough to exclude the household from subsidy eligibility), that the criteria did not allow for any regional variations, and that the categorization did not reflect how people move in and out of poverty and migrate between areas in search of work. The State of Maharashtra, among others, has rejected this new methodology and continues to use the 1997 survey data, which are bound to be somewhat out of date. As a result, it was estimated that about 10 to 20 percent of poor households did not receive the subsidy despite being poor. Local governments tried to compensate by providing additional subsidies to excluded households, even though such local systems are also prone to manipulation.

Community-based targeting consists of identifying poor households through community organizations (as was done in the Dishari project in Bangladesh) or *via community leaders* (as was done by the Savings and Loans group leaders in Vietnam). This appears to be a more flexible, better targeted and probably less costly way to identify poor households. It requires the right type of community mobilization and a spirit of solidarity between community members, so that they agree to see the subsidy paid to the poorest or even to transfer some of their own funds. In Bangladesh, community-based selection was introduced in the Dishari project to improve on the targeting of the hardware subsidy scheme run by the Government of Bangladesh, which had a high inclusion error (20 to 50 percent of subsidy recipients were not deemed eligible according to an ex-post evaluation). This was facilitated because all village residents were working together towards the achievement of a common goal, and they viewed helping the poorest get access to the subsidy as helping themselves to reach a collective goal (with financial rewards attached).

In *Vietnam*, the program targeted poor households with no access to sewers. Such regional targeting was combined with selection by the Savings and Loans group leader, who identified which households could receive a loan based on whether they were deemed able to repay. This worked to some extent, as all households that obtained a loan were in the bottom 20 percent in terms of income level, but it excluded the most indigent. To avoid sending confusing messages, it was deemed preferable to roll out the microcredit scheme first, before using the remaining seed capital to provide subsidies to the most indigent. One drawback of this method is that it gives a lot of power to the group leader and is not easily replicable.

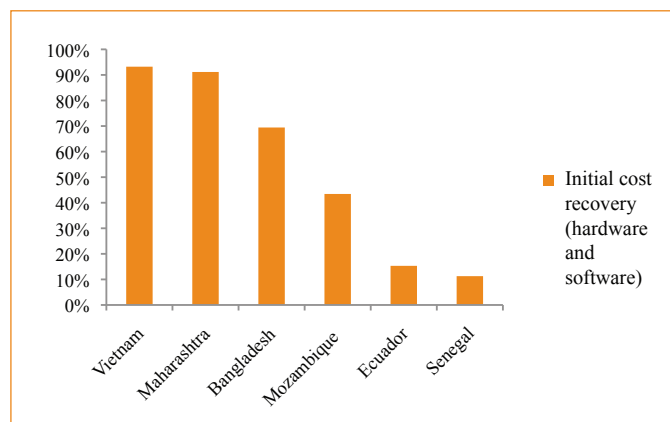
Self-selection, whereby the project offers a basic level of service that only appeals to poor households, is effectively taking place in Mozambique now that income levels have risen slightly. The improved latrines provided by the project mostly appeal to poor customers because they are affordable, whereas slightly richer households would rather build septic tanks.

3.5 Financial sustainability

This set of indicators examined whether the financial approach could be sustained over time, based on the percentage of cost recovery for operating costs and initial costs (hardware and software). Rather than examining the physical sustainability of the initial investments (which is reviewed under Section 3.1), this set of indicators evaluates whether the sanitation solutions that have been built under the program could be replaced (if they were to fall into disrepair or become full) with a minimum need for external financial inputs. This is equivalent to computing capital and operating-cost recovery ratios when examining the performance of water-sector financial support policies.

Recovery of initial costs varies greatly from one approach to another, which can have a significant impact on the financial sustainability of the programs. Figure 3.6 below shows that whereas households covered 93 percent of initial costs in Vietnam, they only paid for about 11 percent of initial costs in Senegal.

FIGURE 3.6 INITIAL COST RECOVERY



In Vietnam, the seed funds initially provided to the revolving fund have been revolved several times with minimum reduction in the overall seed capital provided. After donors' involvement stopped, the seed capital was transferred to the municipalities, which have been running the scheme successfully since through the Women's Unions. The scheme could continue to operate until demand for the loans was exhausted, and therefore appears highly sustainable. High financial sustainability is also found in the Maharashtra TSC campaign, which has achieved substantial results using public funds in the form of output-based incentives rather than up-front subsidies.

By contrast, in Senegal the program is highly dependent on external financing. Funding allocated at the start of the program was used up within two years, well ahead of target, as demand for the sanitation facilities was high particularly after the subsidy was increased from 50 percent to 75 percent. Construction of on-site facilities had to stop for lack of funds, leaving 70,400 demands unmet as of late 2008. The program was later extended with additional funding from the World Bank and then from GPOBA. However, take-up has been slow for a number of reasons, including a deterioration in economic conditions that has reduced household willingness to make an up-front contribution. In addition, investments in demand promotion may have been partially wasted during the interim period between the end of the PAQPUD project and the start of the GPOBA-funded follow-up.²² Dependence on external funding was also a significant issue in the case of

Mozambique, where the program lost its community animators when donor funds were withdrawn; the program slowed down substantially as a result.

Operating costs are funded by the households themselves, with adequate levels of maintenance. In all projects, households are fully responsible for meeting operations and maintenance costs, and there are no ongoing subsidies to cover those. Nevertheless, there may be some ongoing support from local NGOs or CBOs to keep the project running, as appears to be the case in many areas in Bangladesh according to a recent WaterAid report.²³

Anecdotal or survey evidence in most programs seemed to indicate that the latrines were kept clean and in good working order, even a few years after construction (see Section 3.1 for more details), which means that households are operating the latrines effectively. However, data on pit-emptying are difficult to obtain reliably. In some cases, such as in *Maharashtra*, the latrines had been built relatively recently and there were no reported cases of latrines filling up.

It is often assumed that households will access pit-emptying services when needed, but this is typically an area where households may save or postpone expenditure during tough economic times, thereby jeopardizing the long-term viability of the latrines. In *Vietnam*, the utility billing mechanism actually promotes regular maintenance. All households connected to the water supply network have to pay a wastewater charge, irrespective of whether or not they are connected to the sewerage system. If they are not connected (and have invested in a septic tank, for example, as they did under the project), they can get their pits emptied at no extra cost once every four years by private operators under contract with the utility.

3.6 Scalability

The last criterion examines the scalability of the case study approaches, that is, whether scaling up to cover the population not already covered could be done at a reasonable cost. Scalability is a critical element of project design. Several factors affect the scalability of a sanitation project, including the availability of trained personnel for community

²² The GPOBA-funded program was not reviewed in detail as part of the case study, which was focused on the first phase of the PAQPUD project. The GPOBA program had not been running long enough to allow assessing its impact.

²³ Ross and Cumming 2009.

mobilization, training, management, supervision, or monitoring activities and the existence of an adequate institutional and policy framework. The present analysis is focused on whether the projects are scalable from a financial point of view, that is, whether the country as a whole can afford to scale up a project given overall financial constraints. This is essential when evaluating whether subsidy levels are suitable to a particular country.

To estimate the degree to which scaling-up can be afforded by the different countries, the initial costs per household were multiplied by the number of households to be covered in similar areas throughout the country. For example, if the program is active in rural areas, this consisted in estimating how much it would cost to cover the entire rural population not currently covered. These costs were then compared to the existing sanitation budget (to the extent that it could be estimated) and to the national budget. Such calculations provide a broad estimate of whether the approach would be affordable or not to the country, particularly in the context of limited donor funds. This evaluation was then combined with a review of other factors influencing the approach's scalability, such as the robustness of the existing institutional set-up for scaling up.

*In Mozambique, the PLM workshops that are still functioning are moribund, and the overall approach appears unlikely to be scaled up.*²⁴ Although the case study examined the performance of the PLM over a long period, almost 30 years, it is important to distinguish different phases in the life of the program. From 1985 to 1992, the program received substantial donor support and was successfully scaled up, leading to the creation of PLM workshops in 16 cities throughout the national territory. The withdrawal of donor support together with a poorly managed decentralization process left many of these workshops stranded for cash and scrambling for survival by relying on other income-generating activities. At present, existing workshops cannot scale up their activities because the market in their immediate surroundings is saturated and they cannot afford to invest to serve markets further afield. Setting up new workshops would require both initial investment in software activities, especially training, and substantial government or donor funding. For planning purposes, the government has estimated that improved latrines could be

built for an average of US\$60, of which about US\$25 would be for latrine promotion and health and hygiene education. Without a major re-evaluation of the type of financial and software support needed to keep existing workshops going and create new ones, the existing approach is unlikely to be scaled up.

In Senegal, the approach does not appear to be scalable, given its high costs and dependency on external funding. Extending the approach to cover only the 70,400 outstanding demands would require an additional US\$54.5 million, which is more than five times the annual sanitation budget for the entire country and 1.42 percent of the national budget.

In Ecuador, the approach could be scaled up, especially since the country is comparatively rich and can afford to do so. Extending the PRAGUAS approach to cover the remainder of the rural population lacking access to improved sanitation (3.4 million people, or 70 percent of the rural population) would cost approximately US\$231 million. Ecuador is by far the richest country in the set of case studies. Its GDP per capita in 2007 was US\$3,335 at current exchange rates and US\$7,242 at PPP exchange rates, since the purchasing power is much higher than its dollar-based economy would indicate. In such a context, this funding requirement does not appear out of reach and is roughly in line with budgets allocated to water and sanitation investments in secondary towns, for example.

In Bangladesh and Maharashtra, a scale-up of the financing approaches is within reach. In Bangladesh, scaling up the approach to the remaining 1,800 unions that have not been 100 percent sanitized appears to be financially feasible within two years. All communities have already been "ignited" (to use a CLTS word), throughout the country, but the key question is how to roll out support to those communities. A more significant constraint than finance is the availability of good quality facilitators, since these are critical to ensure the approach's success. In Maharashtra, the program has already been extended to all districts in the state, and because the budget for these activities represents a tiny portion of the state's total budget the program appears fully scalable.

24 Due to a lack of national data in Mozambique following decentralization, we could not estimate the costs of scaling up the approach and compare such costs to the national budget.

In Vietnam, scaling up the financing approach appears eminently feasible for those who can afford the loan. If the remaining 12 percent of Vietnam's urban population without access to improved sanitation were to gain access via this approach, the financial cost would be about US\$16 million. This is 1.8 times the government's estimated annual budget for sanitation and therefore seems affordable if spread over several years. In fact, the approach has already been scaled up through a number of donor-funded projects (including World Bank projects²⁵) and through the Vietnam Bank for Social Policies, a national development bank. A change in approach, possibly using a higher rate of subsidy through a revolving fund program or direct subsidies, may be warranted for the most indigent, who cannot afford a loan at current terms.

3.7 Summary evaluation

Table 3.6 provides a summary evaluation of how the different case studies performed with respect to the six criteria: impact on sustainable access to services; costs; effectiveness in the use of public funds; poverty targeting; financial sustainability; and scalability.

Some approaches, such as in *Maharashtra* and *Bangladesh*, have done very well on all parameters and appear highly replicable. They are applicable in certain settings, such as rural settings in South Asia and probably on other continents as well, but may be less successful in areas with less community cohesion and higher expectations in terms of service levels. In rural Ecuador, for example, the rural population expects a piped water connection and a flushing toilet and would not settle for a lower level of service such as a dry latrine. Nevertheless, the approach used in Maharashtra, where households receive a subsidy to cover a basic level of service

and are encouraged to invest in higher service levels if they so wish, could potentially be adapted to circumstances where service expectations are high. The mechanisms for targeting subsidies in Maharashtra could probably be improved, however, as they suffer from a relatively high exclusion error due to disputed criteria for poverty targeting.

The sanitation revolving fund approach in *Vietnam* was very effective at leveraging household investments and proved highly sustainable and scalable. A potential drawback is that the most indigent are excluded, so they may need to receive direct support, as was done through a number of benefit schemes in Vietnam. This approach, based on microcredit, could be replicated in densely populated urban areas on the condition that a strong microfinance institution can be identified and that the credit scheme does not compete with high subsidies available to all.

By contrast, the financing approach in *Senegal* does not fare well when measured against these criteria, even though the project as a whole has been successful at putting on-site sanitation on the map in Senegal and in neighboring countries. The adopted approach has led to high costs that are not affordable to the local population without substantial external support. As a result, the financial sustainability of the scheme is very fragile. Scaling up such an approach to reach the country's MDGs would simply be beyond Senegal's means. Elements of this approach could nevertheless be adopted in other settings, such as the provision of output-based subsidies to local producers, which was practiced in *Mozambique* as well. Finally, the approach in *Ecuador* worked well, but given the relative wealth of the country it may prove too expensive to replicate in other countries with more limited public funds.

25 The total working capital for sanitation microcredit in World Bank projects in Vietnam is estimated to be about US\$25 million as of March 2009.

TABLE 3.6. CASE STUDIES: SUMMARY EVALUATION

	Bangladesh	Ecuador	Maharashtra	Mozambique	Senegal	Vietnam
Impact on sustainable access	Substantial and rapid increase in coverage, mostly sustained	Substantial increases in coverage with good evidence of use	Very rapid increases in coverage (with some cases of relapse)	Rapid increases in coverage only when software support was also provided	Speed of coverage increased when required household contribution was reduced	Rapid extension of coverage
Costs	Basic sanitation costs reasonable when compared to household income (3% to 4%)	Comprehensive sanitation solutions: costly but meet existing demand	Improved sanitation, households invest based on what they can afford	Affordable basic sanitation solutions, reduced demand when incomes grow	Comprehensive sanitation solutions but expensive by both national and international standards	Costs moderate compared to other programs but high when compared to household incomes
Effectiveness in use of public funds	High leverage	Low leverage	High leverage	Medium leverage	Low leverage	Very high leverage
Poverty targeting	Effective targeting through community involvement	Geographical targeting reached intended recipients	Means-tested targeting effective although some are excluded	Self-selection via level of service, with limited inclusion error	Geographical targeting reached intended recipients	Effective targeting, although lowest income excluded
Financial sustainability	Sustainable as long as public sector continues to contribute	Highly dependent on external financing	Low demands on external public funds	Dependent on external financing (with a marked decline when subsidies drop)	Highly dependent on external financing	Financially sustainable: initial public funds have revolved many times
Scalability	Scale-up achievable at a reasonable cost	Scale-up could be achieved given relatively high national income	Has been scaled up at federal level (coverage still needs to improve)	Was scaled up in major urban centers but further scale-up unlikely	Too expensive to scale up nationwide	Scale-up has been achieved in country
Summary evaluation	Efficient use of public funds for rural settings with strong demand for low-cost solutions	Only useful for countries willing and able to fund high levels of service	Efficient use of public funds, which are provided on an outcome basis	Efficient use of public funds with simple and effective targeting	Limited use: high demand on public funds and limited leverage	Very efficient use of limited public funds but may be hard to replicate

IV • Summary of findings

This section summarizes the study's main findings, drawing implications for policy and program design wherever possible. The study also identified key data limitations in the projects' monitoring and evaluation frameworks; such gaps are characteristic of the sector and result in inadequate data on which to base policy. The last subsection therefore identifies areas where information and knowledge need to be strengthened to improve the design of future sanitation projects and programs. Further research and innovation in finance will be essential as financial resources become more constrained in the context of the global financial and economic crisis.

4.1 What have we learned?

Financing approaches can have a significant impact on the cost-effectiveness, equity, impact, and scalability of sanitation projects.

Public support has a significant role to play in creating demand for sanitation, supporting the development of sanitation entrepreneurs and alleviating affordability constraints. This study has shown that the way such public support is financed can have a significant impact on the performance of sanitation projects and on their scalability.

In all cases reviewed, public support for sanitation triggered a significant increase in household sanitation, with an increase in coverage of at least 20 percent and sometimes as high as 70 percent. Providing public support for household sanitation can take many forms, as the diversity of approaches documented in this study shows. Software support can finance activities such as community mobilization and awareness raising that are critical to unlock demand for sanitation services. Hardware subsidies can be used to encourage investment beyond the level that would be carried out based solely on private benefits and can help lift the affordability constraints for poor people. Facilitating access to finance and providing seed financing for revolving funds can lift the liquidity

constraint that many poor households face in developing countries, a constraint that is likely to grow even more acute in the context of the global economic crisis.

The use of scarce public funds needs to be optimized in order to achieve maximum results. Care is essential in the design of the financing approach at the outset of on-site sanitation programs, which are too often treated as small isolated components in broader water and sewerage projects. Only financially sustainable approaches have the potential to be scaled up to make a significant contribution to meeting the MDGs.

Households are critical investors in on-site sanitation at the household level.

The study confirmed that households are key investors in household sanitation facilities, except in highly subsidized schemes. None of the projects reviewed in the study started from the premise that the poor are too poor to pay anything for access to sanitation.

Poor households can allocate a substantial portion of their income to sanitation investments (up to 25 or 30 percent of annual income in some cases, as in Vietnam) if they can see the need and potential benefits from it and are given access to credit in order to spread the investment over a longer period. Indeed, in the majority of cases, except for the poorest, poor households seemed to face a liquidity constraint rather than an insurmountable affordability constraint, which is why access to credit appears to have a significant role to play in triggering household sanitation investments. As a result, it is important both to stimulate households' demand for sanitation products and to leverage their capacity to invest.

Hardware subsidies play an important role in making sanitation accessible to all.

Some form of hardware subsidy for at least some users was present in all of the approaches reviewed, albeit in different forms. While the Sanitation Revolving Fund in Vietnam provided a subsidized interest rate on all its loans, the Dishari project in Bangladesh provided in-kind subsidies to the poorest households, which were carefully selected by the community as needing the subsidy (see Table 3.2 for a summary of the design of hardware subsidies in the case studies). While some heavily subsidized schemes covered up to 75 percent of hardware costs (as in Senegal), the Vietnam project only provided relief of about US\$6 per septic tank, which was otherwise financed by the households themselves.

Choosing the appropriate service level and determining the appropriate rate of subsidy are essential to ensuring that the scheme meets demand and is affordable, from the point of view both of the households themselves and of the sanitation sector as a whole. This “affordability threshold” will vary depending on the relative income levels at the household and country level. In Vietnam, for example, BPL households were willing to invest up to 30 percent of their annual income to build a septic tank, especially when those costs were spread over two years via a loan. This may be due to the success of the demand promotion activities and the demonstrated benefits of investing in sanitation.

The choice of service level is critical for the financial sustainability of a sanitation scheme. The study has shown that the choice of service level is critical not only for the social acceptability and marketing success of the approach but also, through its impact on cost, for its financial sustainability. The choice of service level itself depends on many factors, such as expectations, technical constraints, and availability of materials and skilled masons. For example, Bangladesh has been successful because its approach consists of stimulating households to invest in a basic latrine at a cost they can afford. On the other hand, relatively high levels of service were seen as a key determinant for demand for the UBS in Ecuador. The crucial difference is that Ecuador is about seven times richer than Bangladesh in PPP-adjusted terms and the country as a whole may be able to afford a relatively high level of subsidy. In the case of Senegal, however, high cost of service meant that the approach was highly dependent on external financial support and is unlikely to be scaled up to the rest of the country for lack of resources.

High levels of hardware subsidies can dampen financial sustainability and can be significant hurdles for scaling up sanitation programs.

Projects with high levels of hardware subsidies can achieve substantial results in a short time frame and make a significant difference to the lives of poor households. However, highly subsidized hardware subsidy schemes weigh heavily on public finances and can rarely be scaled up on a sufficient scale to meet national coverage targets (as in Senegal), except in comparatively rich countries where high subsidies can be afforded (such as Ecuador). Whether or not a country can finance scaling up of a certain approach to cover the population lacking access should indeed be at the center of decision making about subsidies.

For example, Senegal’s program achieved substantial results in a short time frame but had to stop for lack of funds, wasting investments in demand promotion until the program was extended with additional financing, some of which came from GPOBA. In Ecuador, community contributions, both in cash and in-kind, and an attractive technical solution (UBS) enhanced buy-in from the local populations. However, the subsidy cost (US\$210) per sanitation facility was relatively high, both as a percentage of the total cost: (60 percent) and in absolute terms, when compared to hardware subsidy schemes in the other case study countries (although Ecuador has the highest per capita GDP in the dataset).

Such schemes may also generate negative impacts beyond the project. If projects have a high percentage of subsidies and become quite well known nationally, they can create expectations that then affect the ability to successfully implement sanitation programs with lower sanitation subsidies. This was the case in Senegal, where NGO-led sanitation programs typically had 100 percent subsidies. As a result, people may become less willing to invest themselves as they wait for the subsidized latrines. This would be true of schemes where the subsidy accounts for a very high percentage of the cost of investment and is available to all in specified areas. By contrast, where the hardware subsidy is well targeted and represents a small percentage of the investment costs, as in Vietnam and India, it does not appear to dampen demand.

Hardware subsidies, when well targeted, can be critical as a safety net for the poor.

Findings from the case studies indicate that hardware subsidies should not be used as a substitute for hardware investments by households but rather as a safety net for those who face a hard affordability constraint. To achieve those aims, subsidies need to be well designed and targeted. Findings from the case study research suggest how this can be achieved.

Targeted hardware subsidies made a positive contribution to reaching the poorest in Bangladesh and Maharashtra, in programs that otherwise relied mostly on software support. This enabled lifting the affordability constraint and, consequently, reaching the goals of becoming ODF (as in the Maharashtra case) or becoming 100 percent sanitized (as in the Bangladesh case) for entire communities, rather than leaving out a fringe of the population. Such subsidies may need to be combined with microfinance schemes, however, to ensure that households can build latrines that meet minimum standards and are cheaper to maintain over time or need to be emptied / moved less frequently.

By contrast, leaving out the poorest was a potential limitation of the Sanitation Revolving Fund scheme in Vietnam, as the poorest were not deemed able to repay the loans. In that case, the possibility of offering several types of loans with different rates of subsidies in order to meet the needs of different income groups was dismissed out of hand by the Women's Union during the project design stage; the union advised that such an offer would risk dampening demand for the main loan program. Alternatively, it was envisaged that once all households who could afford it had built a latrine, the remaining seed money could be used as a source of subsidy for the poorest households. This has yet to be implemented, as all households eligible for a loan are not yet covered.

Fixed-amount subsidies rather than percentage-based subsidies seem to be most effective at leveraging household investment while guaranteeing a minimum service level.

The rate of subsidy can be set in different ways: It can either be a percentage of the cost of the facility, as in Senegal and Bangladesh to some extent, or it can be a fixed amount to

guarantee a minimum level of relief to households. The latter approach leaves households the ability to invest in different service levels according to their means, as was done in Maharashtra, Ecuador, and Mozambique, as well as indirectly in Vietnam, through interest rate subsidies.

From a policy perspective, the approach of providing a fixed amount of subsidy to cover a basic standard of service appears to be the right one, because it gives incentives to producers to keep costs down and to be responsive to demand. By contrast, in Senegal the definition of the catalog of sanitation solutions (and their respective prices) was a fairly long and detailed exercise that went through several iterations. The prices that program designers obtained at first were deemed high and technical specifications were modified to reduce the prices. However, once the catalog of services had been set, the local producers had limited incentives to reduce the costs of production since they knew that the subsidy and the household contribution would be sufficient to cover the existing production costs.

Another advantage of fixed-amount subsidies is that they are easier to control from an administrative point of view, since there is no uncertainty over the amount of subsidy needed as a factor in the demand for different options. Finally, fixed-amount subsidies are more equitable: if households want to obtain a higher level of service, they can get it, but they also need to pay for it.

Fixed-amount subsidies need to be managed actively, however, so as to keep up with inflation and other cost factors. For example, in *Maharashtra, the TSC guidelines set a maximum amount of subsidy at Rs 1,500 (US\$24)* for BPL households when the study was conducted in 2008. Although this subsidy was intended to cover approximately 80 percent of the hardware costs, in practice the subsidy is covering only 22 percent of the costs of the latrines. This might reflect several factors: input prices have increased significantly since the subsidy level was fixed, and there are important cost differences from one village to another, which means that the same level of subsidy does not provide the same amount of relief to different households in different locations. For example, households in hilly areas or rocky terrains would need to invest much more than those

in areas where digging is easier.

Transport costs can also have a significant impact. In the PRAGUAS project *in Ecuador, the subsidy provided to households was a fixed amount of US\$210*. Households were free to choose the service level that best met their needs, and the majority of them selected a relatively high level of service, the UBS, with substantially higher costs partly due to the costs of transporting material to remote mountain areas. The analysis carried out for the design of the second phase of the PRAGUAS project in Ecuador investigated the possibility of setting different subsidy levels for different geographical areas, such as coast versus sierra, to reflect the substantial impact of transport costs on the price of materials.

In Mozambique, subsidies were given directly to the local providers supported by the program. These were based on the number of slabs and latrines sold and were fixed once in 2000, following a detailed study that ensured that differentiated levels of subsidy in each town reflected variations in economic conditions and poverty levels. This, coupled with demand promotion activities, enabled strong take-up of the improved latrines. However, these subsidies were never updated, even for inflation, and in some cases they have been discontinued following decentralization. As a result, current levels of subsidies are grossly inadequate to cover costs, and the surviving PLM workshops have to engage in other income-generating activities to cover the deficit.

Subsidy-targeting methods need to be tailored to the country circumstances.

The study has encountered alternative targeting methods for providing hardware subsidies, including geographic targeting, means-tested targeting, community-based targeting, and self-selection. *Community-based targeting and self-selection appear to be more effective than means-tested systems, which can be costly and generate perverse incentives.*

Means-tested systems, as practiced in Maharashtra and Bangladesh, can generate substantial inclusion or exclusion errors if not combined with additional subsidy-delivering mechanisms. When based on surveys for poverty

classification, such surveys can be expensive and unwieldy and cannot be conducted at frequent enough intervals to keep up with households moving in and out of poverty.

Regional targeting can be an effective way of reaching poor households in circumstances where poverty is concentrated in certain areas, such as slums or remote rural areas, but it can raise issues of fairness when used for heavily subsidized approaches that are too expensive to scale up.

Community-based selection appears to be a more flexible, better targeted, and probably less costly way to identify poor households. It would usually need to be combined with regional targeting, so that such mechanisms are established in preselected areas. This approach requires the right type of community mobilization and a spirit of solidarity between community members, so that the better-off members accept that the subsidy is to be paid only to the poorest or may even transfer some of their own funds to make the scheme work.

Finally, no precise data were available to confirm whether or not self-selection is an effective targeting approach. This method appears to be the cheapest and easiest to implement for countries that have limited means to introduce either means-tested or community-based targeting approaches but seek to reach a large population through a basic sanitation program, such as Mozambique, where improved latrines were subsidized. This is consistent with subsidizing only a basic level of service, leaving the choice to households to invest over and above this level of service (that is, the approach used in Maharashtra and Ecuador, where subsidies were capped at a level to cover a basic service).

Providing hardware subsidies on an output basis rather than an input basis can be effective at stimulating demand and leveraging private investment.

Several of the cases used an output-based method to deliver subsidies.²⁶ Providing a subsidy on an output-basis can ensure that the subsidized activity is actually delivered. It can also give incentives to producers to reduce costs and to serve

²⁶ In Senegal, the PAQPUD project was expanded via a GPOBA program, but this phase of the project was not included in the case study as it did not have a sufficiently long track-record at the time of writing.

areas where they would not necessarily go otherwise. From a donor perspective, output-based subsidies can mitigate some of the risk of low uptake in a subsidy program: if there is no demand, for example if the product is not appropriate or incorrectly priced, then there is no output and therefore no payment. However, this would not guarantee that latrines built with such subsidies would actually be used.

In Mozambique, for example, subsidies were provided to PLM workshops based on their sales figures, which helped consolidate the network of workshops during the heyday of the program between 1994 and the late 1990s. These output-based subsidies are interesting as they were paid to the service providers themselves rather than to households. This system was established when the civil war was still raging in Mozambique, which meant that transferring subsidies to service providers was much easier than transferring them to households directly. Combined with software support to build the capacity of the workshops, this allowed strengthening the supply chain for improved latrines and generated a sharp increase in coverage.

In Maharashtra, the method for providing hardware subsidies to BPL households was modified in 2004, when the subsidies became payable only after the village as a whole had reached ODF status. As such, the government has preferred to refer to them as “incentives” given to households after they have already invested in a latrine, “in recognition of their achievement.” Since that change was introduced, the TSC campaign in Maharashtra has gathered pace, with more than one million latrines built every year in rural areas of the state. The change in the subsidy delivery method has led to a paradigm shift in the way the project is managed, as program officers have become much more focused on creating demand and organizing community mobilization rather than on running a construction program for BPL households.

Software support can be effective at triggering demand and leveraging private investment.

Approaches that rested primarily on software support, such as in Maharashtra and Bangladesh (with targeted hardware subsidies for the poorest), had among the highest levels of leverage and most increased ratios of access/public funding in the study set (following Vietnam, where the software

component through the Three Cities Sanitation project was also significant). In Mozambique, the PLM was most effective when community animators could be active in demand promotion, and the decline of the program was closely linked to the withdrawal of such software support following decentralization. Lack of information on the relative costs of different software activities meant that it was not possible to draw inferences concerning the types of software support that were most effective, however.

The software component represented a variable portion of the costs of each facility, ranging from 28 percent in Bangladesh to a mere 7 percent in Maharashtra. Those software costs are important to include in an estimation of the total costs of providing sanitation, as it is critical to evaluate software cost financing requirements in order to preserve the financial sustainability and scalability of the approach going forward. Software costs can be valuable investments, as demonstrated in Bangladesh where demand promotion, community mobilization, and capacity development were the main levers of public support and where the approach had the highest increased access/public funding ratio, so that US\$1,000 was enough to help 135 households gain access to sanitation. (Note that the standard of these latrines was comparatively low, with relatively high operating and maintenance costs). The approach in Bangladesh had comparatively high software costs, however, partly because it supported the training of local governments rather than implementing the project directly.

The provision of financial rewards based on outcomes acted as a strong motivator for villages in Bangladesh and Maharashtra and helped mobilize energies around the achievement of clear goals. These are formally counted as part of the software costs, as distinct from the hardware subsidies, since these rewards were not provided to fund specific investments. The potential risk with such approaches, however, is that the mobilization and motivation will decrease after the objectives have been achieved and the financial reward paid, and villagers will go back to open defecation or stop using the latrines. This risk is present in Bangladesh, since the evaluation is only carried out once and there appears to be a tendency to over-report results. In India as a whole, a national study commissioned by WSP reported that 35 percent of households resorted to open

defecation in panchayats that had been declared NGP the year before (that is, they had been declared free of open defecation and had also reached a number of other environmental objectives). In Maharashtra, this risk was minimized through the introduction of yearly cleanliness campaigns, which have acted as an ongoing monitoring mechanism beyond the one-off NGP assessment.

Facilitating access to finance can be effective at lifting liquidity constraints, particularly when households are willing to invest substantial amounts in household sanitation.

Financial mechanisms such as subsidies or credit can be useful to strengthen the ability to pay and, in particular, to pay more for a higher level of service. Contrary to what is commonly accepted, data from the case studies show that there seems to be a significant demand for sanitation, with people willing to invest a significant percentage of their income in on-site sanitation facilities, as was the case in Maharashtra, Vietnam, Ecuador, and Bangladesh. In a number of cases, households have a liquidity constraint rather than an insurmountable affordability constraint. Facilitating access to finance can help overcome such constraints by spreading investment costs over a number of years.

Revolving funds, as practiced in Vietnam, appear to have remarkable potential for leveraging household investment and maximizing the effectiveness of public funds. Vietnam's Sanitation Revolving Fund leveraged substantial private investment and has proved to be a highly sustainable scheme. In this case, the public sector contributed seed financing and the funds were revolved several times, resulting in a very high leveraging of limited public funds. Building the microfinance component into the design at the outset, rather than as an add-on or an after-thought, appears to be a critical feature of the approach in Vietnam. As a result, the microfinance institution (the Women's Union) had a strong interest in managing the scheme successfully.

It therefore seems important to incentivize microcredit institutions, which are well developed throughout the world but usually more focused on income-generation projects, to get

into the sanitation market, possibly by setting up subsidized lending schemes as in Vietnam. Once these microfinance institutions have realized the potential of the sanitation market through this type of subsidized scheme, they could become more active in the market for all income brackets, including those that do not need (or are not recipients of) a subsidy.²⁷ Embedding the microfinance element into the design of the financing approach, with the provision of seed money to a private lending institution for subsidized loans, was critical to success, since it minimized interference with the scheme and gave clear incentives to the microfinance institution to provide loans for sanitation.

In *Maharashtra*, the performance of the districts that had organized access to credit as part of the program was greatly enhanced, as credit accelerated household adoption of sanitation and increased the leverage ratio from public funds. However, insufficient information was available to evaluate the precise impact of those microfinance products on sanitation investment.

Channeling credit for investment in household sanitation is not straightforward, however, and it is not clear at this stage whether the revolving fund approach could be replicated successfully in other countries. In Senegal, the provision of credit to help households pay their up-front contributions was tried both via formal institutions and via traditional ones, such as the tontines, particularly during the second phase of the program. This has met with limited success, partly because local microfinance institutions were more familiar with making loans for income-generation activities rather than for sanitation investments. In addition, the scheme came after previous NGO-supported on-site sanitation projects that had offered 95 percent subsidies, which meant that the local population was not used to having to invest in improved facilities.

Potential success factors for replicating similar microfinance schemes include the presence of strong microfinance institutions and traditions and the incorporation of microfinance at the core of the financing approach rather than as an add-on or an after-thought.

²⁷ A report by Meera Mehta (2008) for the Gates Foundation explores the current extent of microfinance in water and sanitation and potential for development. Available on the Gates Foundation website at <http://www.gatesfoundation.org/learning/Pages/microfinance-for-water-and-sanitation.aspx>.

4.2 Where next?

This study has sought to define a framework for analyzing the performance of alternative financing approaches to on-site sanitation at the household level. Although the set of case studies reviewed is somewhat limited, it is hoped that a similar methodology can be used in order to expand the range of financing approaches under review to strengthen the evidence base for policy making. In the process, the study has helped identify gaps in our understanding of financing approaches to sanitation solutions. Going forward, it will be important to fill these gaps in order to improve the design of sanitation projects and programs, as described below.

Monitoring and evaluation (M&E) systems will need to be further developed to provide ways of evaluating the effectiveness of public support for on-site sanitation.

Improved M&E frameworks will need to be defined to inform the development of policy. Sound evidence for policy development requires accumulating meaningful and reliable indicators, which should be incorporated into the original M&E frameworks of projects and programs rather than as a late add-on for specific studies. Below are some of the key areas where additional information is needed to help the development of future policies and projects, including cost information, financing data and information on impact and outcomes. Rather than developing such efforts in isolation, the improvement of M&E frameworks for sanitation projects should be linked to the ongoing Global Framework for Action (GF4A) Initiative, which places heavy emphasis on defining a common reporting framework for the water and sanitation sectors, as demonstrated by the pilot GLAAS report.²⁸

COST INFORMATION

Information on the initial costs of program or project development should be computed in a more systematic manner. At present, this information could only be pieced together from various sources, so such a task proved too time-consuming to undertake in the limited time available for the case studies. As a result, information on the initial costs of developing a program has not been incorporated in the analysis, even though there are likely to be broad variations.

The study confirmed that it is difficult to define global benchmark indicators for household sanitation costs. The research has provided some point estimates for given programs with different levels of service, but it is difficult to generalize from these point estimates to inform program design at the country level. For example, hardware costs were much higher in Senegal than in other countries, due to a number of local factors such as the high costs of labor and materials in Senegal's capital, the strength of the local currency, and site-specific factors such as the high water table which made latrine construction more expensive. Each program needs to assess the feasibility of the service levels it is aiming for based on local factors. Point estimates derived in this study can provide a useful basis for comparison, but it would be inappropriate to use such estimates as benchmarks.

Detailed benchmark costs can only be obtained from a comprehensive exercise to gather cost information from a large sample of projects, as well as information on potential explanatory factors for hardware costs. This exercise would inform potential econometric studies to evaluate whether such costs could be reduced through efficiency gains, as the result of different financing approaches or other factors, so as to minimize overall costs. Alternatively, such an analysis could also be done within a particular country where several financing approaches have been tested, to evaluate the impact of these financing approaches on actual costs. This could also be interesting for evaluating software costs. Since software is usually provided by public-sector agencies, efficiency incentives are relatively low and it is difficult to compare the relative efficiency of these alternative approaches to software provision except through an appropriate benchmarking exercise.

Spending on software support is currently poorly understood, and better records are required to track its performance. At present, proper accounting of software costs is rare, which creates the risk that they will be under-estimated in budgets for scaling up a given approach. In most sanitation programs, it is also difficult to assess what software costs have been spent on and for which results, thus making it impossible to assess the efficiency of different software approaches. It would be

28 WHO 2008.

important not only to track total software costs, which are difficult to evaluate, but also to keep track of the unit costs of typical software interventions, such as a “causerie PHAST” (as referred to in Senegal) or media campaign.

Inputs are not often recorded or valued, currently. Such missing inputs include the time that local government officials spend on implementing sanitation programs, possibly at the expense of other programs. Numerous stakeholders, such as government officials, NGOs, and community leaders simply donate their time for the achievement of a greater good. In Vietnam, for example, Savings and Loans Group leaders fulfilled critical functions for the success of the scheme on a purely voluntary basis, drawn by the local prestige it can bestow and the desire to drive improvements for the community as a whole. Although this time is donated, it has an opportunity cost that may need to be valued for a comprehensive estimate of the costs of household sanitation adoption.

FINANCING DATA

Financing data should be tracked as a key indicator in M&E frameworks. All too often, data collection at the level of water and sanitation projects is carried out in a disjointed manner, with project performance indicators recorded in the M&E framework while financial and accounting information is recorded separately. As a result, financial information is seldom used and analyzed in order to inform project design. This is especially true for the choice of the most appropriate financing approach.

A better understanding of all sources of finance, and household finance in particular, is critical to the design of programs, with maximum leverage ratios and maximum effectiveness in increasing access. Assessing the potential role for microcredit relative to other funding sources such as commercial finance and family loans will require evaluating how much households currently invest and how they access the funds. Incorporating such information into the M&E frameworks of projects and programs would help estimate critical indicators, such as the leverage ratio, on a routine basis as part of program management rather than as a one-off, ex-post activity.

We need more information on how much households are investing in on-site sanitation outside of publicly funded programs in order to have a counter-factual and better understanding of which groups are investing (and which ones are not), the costs of their investment (whether they are more or less expensive than with public support), the key factors determining their demand, and so on.

INFORMATION ON IMPACTS AND OUTCOMES

Information on impacts and outcomes is currently very difficult to obtain, especially if no M&E framework is in place. This study deliberately avoided selecting health indicators as impact indicators, since reliable data of this sort would be too difficult, time-consuming, and expensive to obtain. Nevertheless, developing and using reliable and meaningful outcome indicators is the best way to evaluate whether a project and its underlying financing approach is effectively delivering the expected results and whether this is being done in a cost-effective manner. Such cost-effectiveness evaluations are routinely carried out in the health sector, at least in developed countries. If carried out in the sanitation sector, they could help build the case for sanitation promotion and its effectiveness in combating critical diseases such as diarrhea.²⁹

The potential role of microcredit products should be explored further, through pilot projects and the scale-up of successful approaches.

Given the success of the Sanitation Revolving Fund in Vietnam, it will be important to better understand what the critical factors for developing successful microfinance products for sanitation are in different socioeconomic environments. There are few equivalents of the Vietnamese Women’s Union in other countries, given that this is a highly effective and motivated organization that has a national presence. Common stumbling blocks encountered in other, less successful microcredit schemes for sanitation include difficulties in finding a credible institution able to handle a high volume of small loans; lack of effective enforcement and

28 See Ross and Cumming 2009.

follow-up procedures; high transaction costs; prohibitive interest rates; inconvenient local repayment mechanisms; and lack of transparency and governance. Similar efforts to run microcredit programs in Indonesia have failed, due to cultural and societal circumstances. Replicating Vietnam's approach beyond its borders will therefore require identifying those success factors that could be replicated abroad.

Operational guidance should be prepared on the financial aspects of on-site sanitation projects.

Based on the growing body of research on the topic, operational guidance should be prepared to assist policy makers and project designers with the design of the optimal financing approach suited to their country or project circumstances.

This study has shown that there is no one-size-fits-all financing approach that would work in all circumstances. Rather, principles from experience are emerging on how financing approaches can best be tailored to meet the needs of the local situation. Key factors that need to be taken into account when designing a financing approach include the latent and expressed demand of potential recipients for different levels of service, technical factors and market conditions driving the costs of provision, poverty levels and geography (that is, whether the poor live in well identified areas or are more spread out), the state of local credit markets, the institutional set-up of the sanitation sector, and existing financing practices for on-site sanitation.

Rather than prescribing set solutions, such guidance should set out options to navigate through these key factors and choices, so as to maximize the impact of public funds and accelerate progress towards the Millennium Development Goals.

Annex A - Bangladesh case study

Case study written by Shafiu Azam Ahmed and Sophie Trémolet

OVERVIEW OF BANGLADESH CASE STUDY (DISHARI PROJECT)

Key facts	
Project name	Dishari: Decentralized Integrated Sanitation, Hygiene and Reform Initiative
Project objectives	Scale up the Community Led Total Sanitation (CLTS) approach and strengthen local governments so that they can become main implementers of the approach.
Public financiers	Government of Bangladesh and a consortium of donors and NGOs: Water and Sanitation Program, WaterAid, Plan Bangladesh, Dhaka Ahsania Mission (local NGO)
Scale	1,631,000 people reached in 5 rural districts with high incidence of poverty
Time frame	Program years: 2004 to present / Study period: March 2004 to June 2008
Level of service	Basic latrines (below JMP standards in some cases)
Summary of financing approach	
Software support	<ul style="list-style-type: none"> • Software support for community mobilization, sanitation promotion, local government strengthening • Outcome-based financial rewards to villages which are 100% sanitized, provided with no strings attached (do not necessarily need to be spent on sanitation) • Software mark-up = 28% of total costs of sanitation solution
Hardware subsidies	<ul style="list-style-type: none"> • Up-front in-kind hardware subsidies targeted to the poorest • Hardware subsidy: US\$7 per household (42% of hardware costs) • Hardware subsidies = 8% of public funds
Access to credit	<ul style="list-style-type: none"> • Not specifically included
Summary evaluation	
Impact on sustainable access	<ul style="list-style-type: none"> • Contributed to 70% of population in project area gaining access to sanitation (equivalent to a 16% percentage point increase per year in coverage) • Observed high levels of maintenance and user satisfaction although high pressure on delivering fast results may negatively affect long-term sustainability
Costs	<ul style="list-style-type: none"> • Average hardware costs: US\$17 (15% of lowest quintile income) • Operating costs: US\$5 per year (4.5% of lowest quintile income):
Effectiveness in the use of public funds	<ul style="list-style-type: none"> • Moderate leverage ratio: 2.27 • Very high “increased access / public funding” ratio: 135 latrines built / US\$1,000 public funds
Poverty targeting	<ul style="list-style-type: none"> • 7% households in project area received a hardware subsidy • Community involvement in selection of recipients reduced exclusion errors
Financial sustainability	<ul style="list-style-type: none"> • Public funds = 31% of total costs of sanitation adoption (moderate sustainability)
Scalability	<ul style="list-style-type: none"> • Ending open defecation in 1,800 remaining unions is achievable in 2 years

OVERVIEW OF BANGLADESH CASE STUDY (DISHARI PROJECT) CONTINUED

Some lessons learned

What worked?	<ul style="list-style-type: none"> Households were mobilized to build low-cost latrines through community action, which reduced dependency on subsidies while meeting households' demands. Partial hardware subsidies helped the poorest to participate in overall community effort. The Dishari approach based on community involvement radically improved the targeting of subsidies provided by the central government.
What did not work so well?	<ul style="list-style-type: none"> Monitoring and evaluation systems remain weak. They are based on self-reporting, with a tendency to over-report and no independent verification. Levels of service provided are very basic. Alternative financing approach may be needed to help households "climb the sanitation ladder", potentially with recourse to microcredit to help them prefinance investment in higher levels of service.

A.1 Overview of the financing approach

The Dishari project was initiated in 2004 by a group of donors and NGOs, including WSP, WaterAid, Plan Bangladesh, and the Dhaka Ahsania Mission. Dishari stands for Decentralized Integrated Sanitation, Hygiene and Reform Initiative and also means "beacon" in Bangla.

Its main objectives were to scale up the Community Led Total Sanitation (CLTS) approach, originally developed in Bangladesh, which emphasizes community mobilization for the eradication of open defecation. The project aimed to strengthen local governments so that they could become the main implementers of the approach instead of NGOs. This project (which is still ongoing) has been working in five districts to complement the government's national sanitation program and contributed to sanitation adoption by 1.6 million people over the course of four years. The average hardware cost of the latrines built through the program was US\$17.

The Dishari project's financial approach relies mainly on software support for community mobilization activities and sanitation promotion, with about US\$7 spent on software support per household (or 28% of the total costs of sanitation adoption). The households are responsible for investing in latrine construction. They use locally available materials and simple designs to build relatively cheap hygienic latrines that they can afford and meet their needs

The government provides monetary rewards to unions and sub-districts that are 100% sanitized (about US\$2,900 per union and US\$7,250 per sub-district). These rewards come

with no strings attached and can be spent on any type of local development project. Combined with the prestige they bestow and other nonmonetary benefits, these rewards have served as a strong motivator for local leaders and have introduced a competitive drive among villages to improve access to sanitation.

In adoption, to lift the affordability constraint for very poor households, the government has introduced an in-kind up-front hardware subsidy (equivalent to about US\$7 per subsidized household), which provides construction materials to households identified on the basis of strict criteria and community meetings (these households had an estimated income of less than US\$290 per household per year). About 7% of households in the project area benefited from this subsidy, which covered approximately 42% of their hardware costs.

This case study first presents the country and sanitation sector context in Bangladesh as the background. It then examines the Dishari project in detail, including the project's approach and institutional set-up. In section A.3, project costs, sources of finance for household sanitation and subsidy design issues are discussed in detail. Section A.4 analyses the project's performance in terms of impact on sustainable access to services, efficiency, effectiveness in the use of public funds, poverty targeting, financial sustainability and scalability. A summary evaluation of the financing approach is presented in the last section.

A.2 Country and sanitation sector context

A.2.1 Country context

Bangladesh is a small country located in South Asia. With a population of 150 million, it is one of the mostly densely populated countries in the world. The country is also one of the poorest in Asia, with a GDP per capita of US\$463 or US\$1,311 in Purchasing Power Parity (PPP) adjusted terms in 2007.

A.2.2 Initiatives taken to increase sanitation coverage

Up to the 1970s, a large majority of people defecated in the open in rural areas of Bangladesh and there was little demand for sanitation. A number of government programs were introduced to change these practices (with donor assistance), which relied on relatively high-cost subsidized latrines. These projects failed to achieve substantial results as they did not include the critical component of social mobilization.

In the late 1990s, the international NGO WaterAid tested a new approach based on community mobilization, which would later be referred to as Community Led Total Sanitation. This approach was initiated by Dr. Kamal Kar working with a local NGO, the Village Education Resource Centre (VERC). The approach met with immediate success, as community leaders quickly emerged and villages adopted collective actions to stop the practice of open defecation. The villagers built simple and cheap latrines themselves with locally available materials and without any external subsidies, apart from occasional and voluntary cross-support from richer households to poorer ones.

A.2.3 Access to sanitation in rural areas

Thanks to the spread of the CLTS approach, Bangladesh has witnessed a most remarkable change in sanitation coverage in the last few years. In late 2003, the government estimated sanitation coverage (i.e., the percentage of households with hygienic latrines) to be 29% and 60% in rural and urban areas, respectively. By the end of 2008, these figures had shot up to 88% for both urban and rural areas. These figures are not universally accepted, however. They are compiled by the Bangladesh National Sanitation Secretariat based on self-reporting by field staff and local government and with no independent verification. They define a “hygienic” latrine as one that breaks the disease transmission route. This, coupled with

the fact that there is a monetary reward for achievement, has rendered the official numbers somewhat vulnerable to inflation. Although data from the Joint Monitoring Programme (JMP) were originally showing much lower figures (with improved sanitation coverage at about 30% in 2008), these data have subsequently been revised and appear to be much closer to government’s figures.

Whatever figures are used, it is clear that open defecation has been reduced greatly in Bangladesh and it is estimated that more than 90 million people have gained access to sanitation within the household in the last five years. However sustainability is a major challenge. In a flood-prone and poverty-stricken country like Bangladesh, permanently eradicating open defecation does not stop at constructing a sanitation latrine but also requires its proper use and maintenance.

A.2.4 Institutional set-up for sanitation

Government organization at the national level. The Ministry of Local Government, Rural Development and Cooperatives (MLGRD&C) is the line ministry in charge of providing safe water and sanitation in Bangladesh. As such, it is at the helm of the national sanitation program. The Department of Public Health Engineering (DPHE) is the line agency that works under this ministry to implement water supply and sanitation projects.

DPHE is responsible for planning, designing, implementing and monitoring water supply and sanitation in both rural and urban areas of the country except Dhaka, Chittagong, Khulna and Narayanganj cities. In rural areas, DPHE provides technical advice to local government institutions (e.g., upazila or sub-district councils and union councils) and helps in installing, operating, and maintaining public water and sanitation facilities. DPHE is the focal agency for initiating national policy frameworks and development plans in the water and sanitation sector under the guidance of the MLGRD&C and the Planning Commission of the Government of Bangladesh. DPHE has a network of offices down to the upazila level.

Government organization at the local level. Administratively, the country is divided into six divisions, 64 districts, 508 sub-districts (upazilas), and 4,466 unions. The lowest tier of local government in rural areas is the union council. Each union council has a directly elected chairman. Each union is divided

into nine wards represented by an elected ward member. There are 40,194 wards with an average population of 3,088. Below the ward, there are clusters of households commonly known as paras. There are about 10 paras in each ward with an average population of about 300 per para.

The union parishads (UPs), the lowest tier of local government in Bangladesh, have been entrusted with the task of latrine distribution and promotion. Resources from the center are channeled through the UPs for this purpose. The UPs are contributing to the national sanitation program by organizing public awareness campaigns at the local level through public meetings and rallies. They prepare the list of poor families eligible to receive sanitary latrine components (rings and slabs with pan) and ensure their distribution. They also monitor and keep record of progress. However, the UPs have limited staff to carry out such tasks. This is compensated by assistance from DPHE and NGOs working in their area.

Sanitation task forces. Sanitation task forces were created from the national level down to the ward level. These task forces are quite broad-based: they include not only government officials but also members of civil society. The members of the task forces at various levels are generally nominated by the elected representatives or bureaucrats. They are finally selected by consensus during local meetings. The members do not receive any remuneration. The main function of the task forces is to produce work plans to achieve the national sanitation targets at their level. They are also in charge of monitoring and evaluating progress, overseeing the distribution of funds, helping to mobilize local resources and building public awareness. These task forces have played a very important role in getting all players on board in order to achieve the sanitation target.

A.3 Dishari project design

A.3.1 Dishari project overview

The Dishari project was designed with the objectives of scaling-up CLTS approaches through the involvement of local governments.

The Dishari project was initiated in 2003 by three partner organizations, including WSP, Plan Bangladesh, and Dhaka Ahsania Mission, with WaterAid Bangladesh joining as the fourth partner in April 2005. The project was designed based on

the observation that CLTS had been implemented by NGOs via pilot projects with little potential for scaling-up. Involving local governments was seen as a good way to strengthen the approach's scalability and sustainability as they are a permanent institution whereas NGOs may come and go. The project was formally launched by the Local Government Minister in 2004. Funding from WSP ended in June 2007. Some activities were scheduled to continue with WaterAid Bangladesh funding up to March 2009 in Jamalpur district. Plan Bangladesh will support Dishari up to June 2009 in four other districts (Dinajpur, Gazipur, Lalmonirhat and Nilphamari).

The purpose of the project was to develop a decentralized implementation process and strategy for an upazila-based sustainable model of total sanitation steered by union parishad.

The main aim of the Dishari project was to build the capacity of local governments to enable them to take the leadership for promoting CLTS. The Dishari project personnel only provided facilitating support to local governments, which were placed in a leadership role. The focus of the Dishari project is on the upazila level, with coordination and planning activities organized at that level. In addition, capacity building activities are done at the union level. Actual promotional activities and community capacity building take place at the village and hamlet level. The existing government-led set-up of sanitation task forces at various levels was used and complemented by adding activities at the para level (the lowest level of local government) as it was felt that intensive social mobilization is best done at the grassroots level. At that level, CLTS activities, such as social mapping, feces counting, and the "walk of shame," were quite similar to those in the early model.

The Dishari project works in five districts (Dinajpur, Gazipur, Jamalpur, Lalmonirhat and Nilphamari) most of which are districts with comparatively high levels of poverty

These districts were selected based on the existing field projects of the sponsor agencies (Plan Bangladesh, Dhaka Ahsania Mission, and WaterAid Bangladesh). This was done partly to avoid the costs of setting up new facilities and so that, when the project ends, the work could continue through the other programs of the sponsoring agencies, as sanitation was seen as an entry point for greater local development.

The districts selected for implementation were in highly poverty-prone areas. It was deemed that if significant impacts could be demonstrated in such areas, it would be easier to convince the Government of Bangladesh of the model's effectiveness. The selected areas are all in the north of the country, where famine-like crises often strike. Jamalpur is one of the poorest regions in Bangladesh which also suffers from regular floods. A relatively affluent area in Gazipur district was also selected to give a balance and show that the model also works in places that are richer and closer to the capital city.

A.3.2 Dishari project institutional set-up

The project is jointly funded by WSP, Plan Bangladesh, and WaterAid Bangladesh. Dhaka Ahsania Mission is the implementing agency. A project management team comprised of senior staff from each agency is the overall guiding authority. The project is managed by a central team located in Dhaka. It is headed by a project manager. Different units such as program support, advocacy and research, and administration and finance are included in the central team.

At the field level, Dishari has a small footprint. There is an upazila coordinator stationed at the upazila level. S/He is assisted by a few supporting staff. At each union, there is a union facilitator. The union facilitator has become a technical arm of the union parishad in many areas. In the Jamalpur area, there were two associate union facilitators to supervise activities in relation to water supply and community toilets in schools and public places.

A.3.3 Levels of service

The Dishari project does not recommend any particular type of latrine but it promotes the construction of latrines that have the basic characteristics of a hygienic latrine

Latrine components such as concrete rings, slabs, plastic pans, pipes, and water-seal are generally available in rural Bangladesh thanks to established private-sector businesses. In addition, the Dishari project trains rural sanitation engineers in the proper latrine construction techniques, including assembly of the water-seal, vent pipe, and so on, in order to ensure a basic level of quality.

The latrines that have been built in the project area are mainly pour-flush pit latrines with three or more concrete rings to

line the pit. There is either a concrete slab with a plastic pan or simply an earthen floor with a plastic pan. Vent pipes are made of plastic or bamboo. People are encouraged to install plastic water-seal devices. In most cases, the superstructure is built of simple household materials such as bamboo poles and gunny cloth, depending on the household's financial means. More affluent people use corrugated iron sheets (tin sheets).

CAPITAL COSTS OF HYGIENIC LATRINES

The average cost of materials for a latrine in rural Bangladesh is about BDT 600 (US\$8.70) based on the retail price in the field. This includes three concrete rings to line the pit, one concrete platform with a plastic pan, plastic water seal gooseneck, and a vent pipe. Labor cost is generally not calculated because most families dig the pit and install the latrine themselves. However, for calculation purpose, the labor cost can be estimated at BDT 200 (US\$2.90). In addition, there are some transport costs to carry the materials from the production center or shop to the home. This cost depends on the distance and accessibility of the locality. Sometimes the materials are transported by boat, but more often by rickshaw (tricycle) vans. This cost may be estimated to be about BDT 100 (US\$1.45).

The superstructure costs can vary greatly, depending on the construction materials used. It can be just a gunny sheet thrown over a few bamboo poles, or it can be made of CI sheet (tin sheet) or even brick and mortar. The superstructure is usually built with materials available to the household. For estimation purposes, we may assume that the superstructure cost is about BDT 300 (US\$4.35) based on a typical model made of bamboo poles, walls and roof. Therefore, the total cost for installing one pour-flush sanitary latrine would be about BDT 1200 (US\$17.40). This is a general estimate. Interviews with villagers in the Dishari project area showed that the total cost of installation varied from BDT 414 to BDT 2,180 (from US\$6 to US\$32). Some high-quality latrines can cost up to BDT 10,000 (US\$145) and very low-cost latrines can cost only BDT 70 (US\$1.00).

OPERATING COSTS OF HYGIENIC LATRINES

The operating costs of a hygienic latrine include pit emptying or shifting the latrine to a new pit when the existing pit fills up. It is estimated that a pit may fill up in three years. Its costs

about BDT 180 to de-sludge or shift a latrine. This work is done manually and can even be done by householders themselves, by simply transferring the slab/pan and reusable rings and digging a new pit. Converting this to a monthly cost it amounts to BDT 5 per month. Other costs include buying soap for hand washing, a broom to clean the latrine, a water pot for cleansing, and sandals to wear while using the latrine. In total, the costs for consumables and shifting the pit (on an annual basis) are estimated at US\$5 per year.

A.3.4 Dishari project costs

The total expenditure of the Dishari project over 4.33 years (March 2004 to June 2008) was about BDT 152,940,085 (US\$2.2 million). The vast majority of project expenditure

(84%) was spent on software, which includes staff salaries, research, training, exposure visits, publication, travel, public awareness, communication (telephone/fax/email), office rent, equipment rent, and overhead.¹

A main thrust of the project was to try and keep project staff levels down to a minimum so as to strengthen the union parishads and upazila administration. There was about 3 project staff in each union in the project area and 4 at the upazila level, plus 15 at the central level in Dhaka, which meant about 178 staff in total worked for 80 Unions. Although this may appear to be a large number, this is equivalent to 1 staff per almost 9,161 people served in the project area, which is a rather modest number.

TABLE A.1. DISTRIBUTION OF EXPENDITURE BY THE DISHARI PROJECT (MARCH 2004-JUNE 2008)

		BDT	US\$	% of total costs
Hardware	Institutional sanitation	4,808,000	70,000	3
	Water supply	20,043,000	290,000	13
Software	Staff salaries and management	128,090,000	1,856,000	84
	Total	152,941,000	2,216,000	100

A breakdown of the software costs for the Dishari project is shown in Table A.2 below.

TABLE A.2. BREAKDOWN OF SOFTWARE EXPENDITURE BY THE DISHARI PROJECT (MARCH 2004-JUNE 2008)

Item	BDT	US\$	%
Hygiene promotion (meetings, sessions)	2,959,000	42,881	2.31
Project management including supervision and monitoring	2,659,000	38,540	2.08
Technical assistance (capacity building, research and publication) including travel	24,973,000	361,924	19.50
Promotional activities (rallies, campaign, events on WSP and advocacy)	7,261,000	105,237	5.67
Salary of staff, overhead and recurrent costs	90,238,000	1,308,000	70.45
Total	128,090,000	1,856,582	100

¹ Some hardware support was provided for water supply (handpumps) in certain areas from WaterAid (mainly for the renovation of handpump platforms). In addition, hardware support was provided for institutional sanitation, which allowed building 91 school latrines and 29 public toilets.

A.3.5 Sources of Finance for Household Sanitation

The adoption of sanitary latrines at household level was supported by multiple sources of finance, as presented in Table A.3 below.

The largest source of finance was from the households themselves, who provided almost 70% of total costs, followed by the Dishari project (21%) and Government funds (10%). Below we provide additional information on these sources of finance.

Households were the main source of finance for building the actual latrines.

Detailed information on household financing was not available as part of the standard information collected by the project. It was therefore necessary to formulate assumptions based on the average cost of a latrine to derive estimates of total household financing. Given that the average cost of a latrine was estimated at BDT 1,200 (US\$17.39) and that 362,385 new latrines were installed during the life of the project, the total costs of latrine installation was estimated at US\$6,302,348. However, part of these costs was covered by a government subsidy (the ADP grant), which means that the estimated household contribution was US\$6,093,452. This represented 96.7% of total investment costs (hardware component). In addition, households invested in rehabilitating and upgrading existing latrines, although it was not possible to obtain cost information on such efforts.

The Dishari project funds covered 75% of the software costs.

For the purpose of this estimate, only the software costs of the Dishari project were included. For lack of a cost allocation method between the different components of the project, all software costs have been included in this estimate of household sanitation adoption. However, this is likely to be a slight overestimate given that other activities were financed by the project, such as institutional sanitation and some hardware support for water supply.

Government funds came from several sources and covered both hardware and software.

Given that the Dishari project assisted government efforts to promote sanitation, it is important to take account of the costs of government support in order to derive the total costs of sanitation promotion in the project area. Government support is provided through several sources:

- *20% of the Annual Development Program (ADP) funds*, which local governments receive every year, are earmarked for sanitation. This allocation is from the Ministry of Finance for national development and is provided as a grant to all local governments;
- *Rewards for achievement of ODF status* are given to unions and upazilas;
- A portion of the *general block allocation* that is transferred from the Ministry of Local Government is spent on sanitation; and
- A percentage of *local government staff* costs is spent on sanitation.

TABLE A.3. TOTAL COSTS OF HYGIENIC LATRINE PROMOTION AND ADOPTION AT THE HOUSEHOLD LEVEL (US\$) (MARCH 2004 – JUNE 2008)

	Hardware	Software	Total	% of total
Dishari project		1,856,373	1,856,373	21%
Government funds				
ADP grant	208,896	69,632	278,528	3%
Rewards				
Unions		231,884	231,884	3%
Upazilas		57,971	57,971	1%
Block allocation		115,942	115,942	1%
Government staff costs		142,350	142,350	2%
Household finance	6,093,452		6,093,452	69%
Total	6,302,348	2,474,152	8,776,500	100%

ADP funds mostly covered the costs of hardware subsidies for the poorest families, as well as some sanitation promotion activities.

Since 2004, the government has been allocating 20% of the ADP fund to upazilas for improving sanitation coverage. According to the government policy, 90% of this allocation was to be used to give hardware subsidies to the poorest people. The government's thinking was that although it is possible to achieve nearly universal sanitation through social mobilization, a section of the population is too poor to afford a sanitary latrine.

The remaining 10% of the ADP funds for sanitation were to be used for promotional activities such as public meetings and rallies. In January 2005, the fund for promotional activities was increased from 10% to 25% following demands from the field (see Box A.1 for an example). When all poor households are covered, the money assigned to hardware subsidies is to be used for hygiene promotion and installation of latrines in public places.

Under the government reward scheme, unions that achieve 100% household sanitation are given a cash reward of BDT 200,000 (US\$2,900) and each upazila that achieves this objective receives BDT 500,000 (US\$7,250)

The reward money comes with no strings attached and may be used for any kind of development work, such as road construction. Some unions have used a portion of the money for public latrines while many others have used it for other types of development work, such as road construction. Another nonmonetary incentive comes in the form of a certificate. The chairman of each union council that achieves 100 percent household sanitation receives a certificate given by the local government minister. The ceremony has provided strong motivation for local politicians.

There are a number of problems with this incentive scheme, however. Some unions have been declared sanitized when in reality not all households have actually installed latrines. The absence of a system for third-party verification of the claims has encouraged this kind of practice. The other problem with the government incentive scheme is its emphasis on counting latrines, which is the only aspect of performance that is rewarded, rather than their sustained use or the adoption of

BOX A.1 – EXAMPLE OF GOVERNMENT SUBSIDY SCHEME ALLOCATION

Laxmirchar union in Jamalpur Sadar District (in the Dishari project area) received a total ADP allocation of BDT 240,641 (US\$3488) in fiscal year 2005-2006. Twenty percent of this amount was earmarked for sanitation, which amounted to BDT 48,128 (US\$698). Seventy-five percent of these funds, or BDT 36,096 (US\$523), were spent to procure sanitary latrines for hardcore poor households. The remaining 25 percent or BDT 12,032 (US\$175) was used for software or promotional activities.

This shows that the hardware subsidy component is not very large in comparison with the number of villages in each union. In the above example, the hardware subsidy for one year in a union was BDT 36,096 (US\$523). As there are about 10 villages in a union, each village on average received about BDT 3,600 (US\$52), which makes it possible to procure only about seven sets of latrines. There are typically 600 households in a village. Therefore, just about one percent of the households received the subsidy in a year. Considering the big jump in the number of sanitary latrines installed, the main force behind this has been the successful motivational campaign rather than the hardware subsidies provided.

hygiene practices. The government target is to reach “100% household sanitation” and not a behavioral outcome, such as ending open defecation. The Dishari project sought to complement the government program by ensuring that the ODF objective was also met in the project area.

Government staff costs at the local level need to be taken into account but are difficult to cost.

On average, union council members and other government staff work intensively for about 4.5 months over a total period of one year to achieve 100% household sanitation in their community.² Costing their time is difficult, as they perform many other functions at the same time. For the purpose of the study, we have estimated the time allocated by UP officials to

achieve the target multiplied by their salaries. These estimates are summarized in Table A.4 below. Total UP staff costs were estimated by multiplying this unit cost by 65, the number of UPs that achieved the target during the period.

TABLE A.4. ESTIMATED GOVERNMENT STAFF COSTS FOR ACHIEVING 100% SANITATION AT THE UP LEVEL

UP Officials	Person	BDT/ month	Month	Amount (BDT)
Chairman	1	3,000	4.40	13,200
Members	12	1,500	4.40	79,200
Secretary	1	5,000	4.40	22,000
Village police	10	1,000	3.67	36,700
			Total	151,100

In addition, many other people – school teachers, imams, women’s groups, students, and elders – supported sanitation at the local level by attending and organizing numerous community meetings, but it is hard to put a monetary value on such efforts.

Some NGOs and voluntary organizations provided additional support.

Some NGOs and voluntary organizations also provided limited assistance. For example, NGOs operating microfinance programs cooperated with union parishad, and made the installation of sanitary latrines an integral part of their home improvement loan. NGO staff and beneficiaries also participated in campaigns against open defecation. The contribution from NGOs was relatively high to start with but recent information from the Dishari project shows that the percentage of latrines that received financial support from NGOs was only 0.8%. As the amounts are almost insignificant, they are not shown separately in the calculations and are included in the household financing component.

A.3.6 Subsidy design

The government provides in-kind hardware subsidies to the poorest. The union councils procure latrine materials (usually each set consists of three rings and one slab with pan) for the

poorest families, which are given to them free of charge. The cost of these materials is about BDT 500 (US\$7.24) out of a total estimated cost for an average hygienic latrine of BDT 1200 (US\$17.4), which means that the hardware subsidy amounts to about 43% of total hardware costs. The subsidy recipients still have to transport the items, install them at their own costs, and build the superstructure (they are also responsible for the O&M costs).

Criteria for identifying potential subsidy recipients include eligibility criteria and exclusion criteria, as defined in the government’s Pro-Poor Strategy for the Water Supply and Sanitation Sector (2005) and its National Sanitation Strategy (2005) (see Box A.2 below).

BOX A.2 - ELIGIBILITY AND EXCLUSION CRITERIA FOR GOVERNMENT SUBSIDIES

Eligibility criteria

1. Landless households
2. Pavement dwellers/homeless
3. Main earning person or the head of family is day laborer, owning less than 50 decimal of agriculture land or residing in a rented premise lesser than 200 square feet and having no fixed source of income.
4. Households headed by disabled or females or old aged (65+ years) persons.

If the answer to any of the above criteria is ‘yes’, the household will get priority for subsidized water and sanitation services, unless it is excluded by the exclusion criteria:

1. Households that own more than one acre of land (cultivable and homestead) are excluded from the list.
2. Households with income level greater than the income corresponding to the ‘poverty line.’ As per the recent estimates of Bangladesh Bureau of Statistics (BBS), poverty line is defined as income level below BDT 622 per person per month for urban areas and BDT 551 per person per month for rural areas, on the basis of the ‘Household Income and Expenditure Survey.’

2 Although they spend some time after that on sanitation to sustain the achievement, the concentrated effort takes place during this initial period and time commitments from government staff rapidly drop off afterwards.

In practice, lists of the poorest people are prepared at the upazila and union level. The poor households are easily identified by the villagers and the common practice is that the union council prepares the list by discussing with the people in local meetings. Support is given on a case by case basis, depending on what the households can afford. It is always emphasized that the subsidy is a cost sharing mechanism and not a hand-out. Therefore, a fair share from the household is expected to cover both the capital costs and operational costs.

A.4 Evaluation of the project's performance

In this last section, we seek to evaluate the project's performance at extending household sanitation based on criteria set out in the common methodology for the project. Given that the Dishari project supported the national policy, we consider the overall performance of sanitation promotion in the project area rather than being solely focused on the project itself.

A.4.1 Impact on sustainable access to services

The first evaluation criterion is project impact, i.e. *whether the project led to an increase in sanitation access which was sustained over time.* The key finding is that a substantial increase in access to sanitation took place in the project area over the last 4.5 years.

The Dishari project contributed to an increase in coverage from 20% to 90% in 4.5 years, up to June 2008.

The Dishari project does not build household level sanitary latrines, as this is mainly done by the households themselves. Therefore, it is difficult to identify how many sanitary latrines were installed in the project area as a direct result of the project.

However, there is no doubt that the project (and the related government program that it sought to complement) has led to substantial investment by households in hygienic latrines. It is estimated that about 362,385 new household hygienic latrines have been installed in the Dishari project area,³ between the launching of the project in March 2004 and June 2008. As there are an estimated 525,000 households

in the project area according to the Dishari project documents, this indicates that over 90% households in the project area now have a sanitary latrine.⁴ If circumstances where latrines are shared between poor households are included, this coverage figure could be even higher.

65 unions achieved 100% sanitation as of June 2008, or 81% of the unions in the project area.

In addition, the Dishari project touched the lives of all 2.36 million people in the project area. When the project worked in a community or union, all people were reached in one way or another, either through public awareness campaigns, school children's cultural programs, public meetings, rallies or house-to-house visits by para committee members. But not all households responded by installing latrines.

High levels of maintenance and satisfaction were observed throughout the country and in the project area.

A WSP study reported high usage and maintenance of latrines in Bangladesh including in the Dishari project areas (WSP, 2006). About 82% of latrines showed physical evidence of maintenance. There is generally good satisfaction with the latrines as indicated by high maintenance of the facilities. Even though this evaluation was carried out shortly after the latrines were installed, experience in other areas of Bangladesh shows that households usually take care of their latrines once they have built them. They would also invest to go up the sanitation ladder as their economic situation would permit.

A.4.2 Costs

The total cost of building a household latrine is just above US\$24, including the software component.

The cost of building a latrine was estimated, based on the various cost components, at US\$17 for an average design. To this hardware cost, an additional US\$7 must be added for software support, amounting to approximately 28% of the total latrine cost. The Dishari project costs alone accounted for US\$5 per household latrine, or 21% of the total latrine

³ In addition, the Dishari project constructed or repaired 91 latrines at schools and markets in Jamalpur district. The Dishari project also installed or repaired some number of handpumps.

⁴ The 51,539 households (9.82%) non-adopting households are in Jamalpur district where the project started later after receiving funding from WaterAid.

cost. If software costs are spread across all the households in the project area, they represent about US\$4.7 per household.

For each poor household, the cost of building a latrine amounts to between 3 and 4% of its yearly income...

The average annual income of households in the project area is assumed to be BDT 45,000 (US\$650). The cost of installing a sanitary latrine (BDT 1200) is about 2.66% of the average annual income of a typical household in the project area. In the case of the poorest households, the annual income is about BDT 30,000. Therefore, the same cost represents 4% of the yearly income of a poor household.

... although it can go up to 15% for the poorest households.

If we take the poorest households in some of the poorest districts of the project (such as Nilphamari), with an annual income estimated at just under BDT 8,000 (US\$115), the cost of a latrine can represent up to 15% of their annual income. The government subsidy brings down their contribution to BDT 500 (plus labor costs), although this still represents about 6.3% of their annual income.

Operating costs of the latrines are low, at about US\$5 per household per year, and represent a fairly marginal portion of household incomes.

Given that manual labor is very cheap in Bangladesh, the operating costs of the latrines are low, including the costs of emptying the pit or moving it every three years. Operating costs of running the latrine were estimated at about BDT 30 per month or US\$5 per year. The O&M costs, therefore, account for 0.8% and 1.8% of the yearly income of an average and a poor household in the project area, respectively.

A.4.3 Effectiveness in the use of public funds

US\$1,000 of the public expenditure was sufficient to trigger the provision of sanitation to 135 households.

Funds invested by the project and the government led to a high level of coverage for a variety of reasons: first, the latrines built are relatively cheap, at US\$17 on average (just for hardware costs).

One dollar of public investment (from the project and government funds) triggered at least US\$2.3 of private investment from households.

If we estimate the ratio of public versus private investment, we find that public expenditure led to a relatively high ratio of private investment from households. One dollar of public funds triggered at least US\$2.3 of private investment from households building their latrine. This is likely to be an underestimate, as household investment in upgrading existing latrines has not been included (and there is no reliable data on this issue).

A.4.4 Poverty targeting

The Dishari project deliberately targeted poor areas, in order to demonstrate the effectiveness of its approach in the most difficult to serve areas.

The average household income in rural Bangladesh is estimated to be about BDT 6,095 (US\$90) per month or BDT 73,140 per year. The Dishari project area is especially prone to poverty, except the district of Gazipur. The average monthly income of the households in the northern districts is far below the national average. In Dinajpur, Nilphamari and Jamalpur, the average monthly household income is only BDT 3,474 (US\$50), 3,370 (US\$49) and 4,474 (US\$65) respectively. The poorest households earn much less. For example, the annual income of a very poor household in Nilphamari district was just under US\$10 per month. The Dishari project targets all people in its project area, including the poor.

Only a small percentage of households have received a government hardware subsidy.

Some households, identified as the poorest, have received specific assistance from the government program in the form of in-kind hardware subsidies. On average, about 7% of households have received a subsidy from the government in the form of latrine components, whereas the remaining 93% have received no hardware subsidy at all. For those who have received a subsidy, it represented between 42% and 50% of the cost of building a latrine (depending on how manual labor was carried out: poor households usually perform it themselves to reduce costs). In the project area, the Dishari project was instrumental in focusing the subsidies on the households most in need.

The poor households that did not receive a subsidy had to develop strategies to be able to build a latrine.

That may have included several households grouping together to build a shared latrine, adapting the design of the latrine (by using household materials where possible, using just one concrete ring or installing a pan on an earthen mound rather than a concrete slab) and borrowing funds from an NGO or from relatives. In addition, comparatively rich people supported the poor by providing material or land for constructing latrines.

Capture of the hardware subsidy by the nonpoor is a threat to the scheme, however, as it is estimated that up to 50% of hardware subsidy recipients are nonpoor households.

WaterAid Bangladesh conducted an action research on the use of the 20% ADP grant to provide subsidies to the poor.⁵ The study area was outside the Dishari project and included two unions and one municipality. The finding showed that 35%-56% of the subsidy was captured by the nonpoor, largely due to weak monitoring, lack of transparency, and a lack of involvement of the poor.

The Dishari project took particular care to reduce the risk of subsidy capture by the nonpoor. The UP members and communities were made aware of the government program. Poor people were included in the task forces and grass-roots level para committees were created and effectively linked with ward and union task forces. Regular open meetings were held where all issues were frankly discussed. The amount of subsidy received was revealed to the public. The communities themselves identified the poorest families eligible for the subsidy and submitted the list to the UP.

A.4.5 Financial sustainability

Public funds (including for both hardware and software) represent 31% of the total costs of household sanitation adoption, which means that financial sustainability is relatively good.

Public funds, including hardware and software, represent 31% of the total costs of household sanitation adoption in the project area. These costs are, by definition, not recovered. However, all operating costs are the responsibility of households as well as initial investments, which indicates a high potential for financial sustainability.

Sustainability of physical results may be an issue however.

The critical question in terms of sustainability is whether or not the improvements are going to be sustained over time and the latrines effectively used, given that the ODF evaluation is only carried out once. In addition, the financial incentives for UPs to be declared ODF are strong, which could lead to a tendency to over-report results.

The program staff felt that there was an intense pressure to concentrate on latrine installation at the expense of local government capacity building. This happened due to the rush to declare a union 100% sanitized and receive cash reward and recognition. The Dishari staff had to plead with local agencies and administration to slow down so that the process can be internalized by the local government for the sake of sustainability.

A.4.6 Scalability

The last indicator focuses on scalability, i.e. to evaluate how much it would cost to serve all unserved households in the country with an approach like that of the Dishari project, particularly in comparison with the annual water and sanitation sector budget in the country.

In financial terms, it appears possible to end open defecation in the 1,800 remaining unions yet to be ODF in one to two years using the Dishari project approach.

Countrywide, it is estimated that about 60% of the unions have achieved full household sanitation. This leaves 40%, or 1,800 unions, that have yet to achieve this status. To investigate whether it would be possible to scale up the Dishari

⁵ WaterAid, "Poor Targeting of Sanitation Subsidy in Bangladesh" (Dissemination Paper No. 4) (Dhaka: WaterAid, 2008).

approach to reach these unions, we calculated the total costs of scaling up the Dishari project approach to these remaining unions and compared these costs to available public funds.

The total subsidy costs per union parishad reaching ODF were US\$28,559 in the project area over 4.3 years, including the Dishari project costs and local government costs. If one were to start from scratch to expand coverage in these remaining 1800 unions, the total costs would be almost US\$68 million. This is a substantial cost compared to the national annual water and sanitation sector budget, which was BDT 8,275 million (US\$120 million) in 2007 and particularly when compared to the budget available for rural sanitation (7% of that budget or US\$8.4 million). The costs of scaling up the approach therefore represent more than half of the total water and sanitation yearly budget and eight times the annual rural sanitation budget.

However, the remaining 1800 unions have already gone through the national sanitation program activities for over four years. It can therefore be assumed that some progress has already been achieved towards reaching the ODF goal. If we estimate that it would take another 6 months for these villages to reach ODF, the additional budget required could be estimated at US\$7.8 million, which is just under the annual budget for rural sanitation and seems affordable. A critical factor that could potentially limit the ability to scale up the approach is the lack of good quality facilitators, who are the most important tool for implementing the approach.

A.5 Summary evaluation

In this section, we summarize the evaluation of the financing approach based on our set of criteria and draw practical implications for the applicability of this financing approach. Overall, the Dishari project was considered a success, for the following reasons.

In terms of impact on sustainable access to services, the Dishari project triggered a substantial increase in access to sanitation. In just under 4.5 years, 362,385 new hygienic latrines were installed in the project area, resulting in more than 90% of households in the project area having access to hygienic latrines by late 2008. In addition, it has been shown that over 80% of the latrines built demonstrate physical evidence of maintenance. The high degree of ownership is a good indication of sustainability.

In terms of costs, investments were made at a reasonable cost compared to household income. Given that households were making all their investment decisions based on what they could afford, they chose to invest in relatively cheap latrines providing a basic level of service. These latrines cost about US\$17 on average, which represents between 3% and 4% of household average income. In addition, software costs (i.e. community mobilization and hygiene promotion activities, as well as program management and staff costs) accounted for about US\$7 per household latrine, or 28% of the total costs of latrine adoptions. However, the project has not been cheap if compared against government investment, which accounted for just under US\$2 per household latrine. But lack of comparators with areas where the government actions were not supported by the Dishari project means it is difficult to make a definitive assessment of the impact of the project per se and to identify whether the additional software costs were well spent.

Operating costs were also affordable, as they represented between 0.8% and 1.8% of the yearly income of average and poor households in the project area, respectively.

In terms of effectiveness in the use of public funds, US\$1,000 of public funds enabled the construction of sanitation facilities for 135 households. The households themselves invested more than US\$6 million in the facilities, which means that for each US\$1 of public money spent, each household invested more than US\$2.3, which is a substantial contribution given poverty levels.

In terms of poverty targeting, targeted hardware subsidies provided by the government covered approximately 43% of the investment costs per household, bringing down investment costs from 15% to 6% of household incomes. The Dishari project targeted poor areas, with income substantially below the average rural income. Hardware subsidies were only provided to 7% of the population in the project area, however, which means that a substantial number of poor people invested themselves in building latrines without external support. In general, people were willing to invest in sanitation after the social mobilization campaign. However, there were some diehard individuals who refused to comply. The Dishari project did not promote coercive measures but, instead, gentle social pressure by local government and social leaders was applied to persuade them to conform. The fact

that poor households were free to choose the technology that best suited their needs meant that they invested only in what they could afford.

In terms of financial sustainability, public funds represented about one third of total initial costs while operating costs were fully paid by households themselves. This is a fairly high level of cost recovery, which means that the approach is financially sustainable provided public funds continue to be made available. One major concern, however, is the sustainability of physical results, since there is no ongoing monitoring of results once villages have been declared ODF.

In terms of scalability, reaching the 1,800 unions that have yet to be declared ODF could be achieved within one to two years and could be financed with available budget funds. Although implementing the Dishari approach from scratch would be excessively costly, the fact that efforts have already been carried out to reach ODF in these remaining villages means that the ODF goal could be achieved at a moderate cost over the course of a few years.

WHAT SEEMS TO HAVE WORKED?

Overall, relying on household investment for latrine construction seems to have worked, despite pressures from competing NGOs to provide latrines free of charge. Achieving ODF status was achieved through a combination of nonfinancial and financial incentives, as follows:

- *The CLTS approach of community mobilization delivered good results and local governments were capacitated to maintain this approach over time.* The Dishari project helped to successfully shift the role of local government from providing sanitation services to ensuring that such services are adequately provided. The costs of such social mobilization (i.e., the software costs) accounted for about a third of total initial costs, which seemed to be money well spent given the high levels of investment triggered in that way;

- *The focus on mobilizing households to build low-cost latrines reduced people's dependency on external subsidies and helped to quickly scale up the approach.* Partial hardware subsidies provided to a narrowly defined set of poor households helped those households overcome the affordability constraint. Such hardware subsidies represented only 8% of total public expenditure. Those households that did not get a subsidy still chose to invest, through community pressure and occasional support from richer households.
- *Financial rewards provided to villages reaching ODF status (alongside nonmonetary rewards, building on prestige) increased the competitive drive among villages.* Such financial rewards accounted for about 4% of the total costs of latrine adoption. Setting policy targets for local governments (such as 100% sanitation) and rewarding performance seem to have created the right incentives for local governments, so that they could leverage all service providers to deliver a minimum quality of sanitation service for all in an inclusive manner.
- *The Dishari project's institutional set up helped in reducing errors of inclusion* plaguing the government's hardware subsidy scheme (with an estimated 50% of recipients being non-poor households in some cases). In the Dishari project area, the villagers themselves could help decide which families were most in need and would be eligible to receive the subsidy.

AND WHAT DID NOT WORK SO WELL?

The upazila to community chain established by the Dishari project may or may not last beyond the project intervention. If there is continued government interest in decentralization and devolution, this institutional set-up may flourish, but there are no guarantees to that effect.

The government monitoring and evaluation system still remains weak, as it is based on self-reporting by the unions. Third-party verification is not exercised and there is a tendency to over-report, given that achievement of ODF status triggers a one-off monetary reward, with no attempt to verify that coverage is maintained beyond that point. The inclusion of monetary rewards therefore may have introduced a perverse incentive to over-report results. Ongoing monitoring should be introduced (perhaps with the possibility of clawing back some of the rewards) so that such improvements can be sustained over time.

Finally, although the CLTS approach in Bangladesh has been successful at shifting millions of people from open defecation to fixed-place defecation, *the country will need further investment to allow households to “climb the sanitation ladder”*. To do so, higher investments per household are likely to be required, which calls for alternative financing approaches, with the possible inclusion of microfinance arrangements or other mechani

Annex B - Ecuador case study

Case study written by Patricio Arrata and Sophie Trémolet

OVERVIEW OF ECUADOR CASE STUDY (PRAGUAS PROJECT)

Key facts	
Project name	PRAGUAS: Programa de Agua y Saneamiento para Comunidades Rurales y Pequeños Municipios
Project objectives	Expand water supply and sanitation coverage in small towns in rural areas and strengthen local management
Public financiers	Government of Ecuador and World Bank (loan)
Scale	141,320 people adopted sanitation in 383 rural communities
Timeframe	Program years: 2001 to early 2009 / Study period: 2001 to 2006 (4.5 years)
Level of service	Mostly sanitation units, each including a toilet connected to a septic tank and a sink and shower
Summary of financing approach	
Software support	<ul style="list-style-type: none"> • Software support to strengthen municipalities to work in sanitation, provided for technical designs and monitoring • Software mark-up = 12% of total costs of sanitation solution
Hardware subsidies	<ul style="list-style-type: none"> • Up-front fixed hardware subsidies: fixed amount given to each household in the area • Hardware subsidy: fixed at US\$210 per household (about 59% of hardware costs, although the costs can vary and the subsidy is not proportional) • Hardware subsidies = 86% of public funds
Access to credit	<ul style="list-style-type: none"> • Not specifically included
Summary evaluation	
Impact on sustainable access	<ul style="list-style-type: none"> • 27% of population in project area gained access to sanitation or improved existing sanitation solution (equivalent a 6% percentage point increase per year). • No available ex-post data to evaluate sustainability of investments.
Costs	<ul style="list-style-type: none"> • Average hardware costs: US\$355 (21% of lowest quintile income) • Operating costs: US\$72 per year (4.4% of lowest quintile income):
Effectiveness in the use of public funds	<ul style="list-style-type: none"> • Very low leverage ratio: 0.18 • Low “increased access/ public funding” ratio: 2.9 solutions built per US\$1,000 in public funds
Poverty targeting	<ul style="list-style-type: none"> • All households in project area eligible for a hardware subsidy. • Geographical targeting reached intended recipients.
Financial sustainability	<ul style="list-style-type: none"> • Public funds = 85% of total costs of sanitation adoption, indicating high dependency on external public funds.
Scalability	<ul style="list-style-type: none"> • Scale-up could be achieved given comparatively high national income.
Some lessons learned	
What worked?	<ul style="list-style-type: none"> • Choice of service levels proved very attractive for the local population: fixed hardware subsidy level left choice open to recipients while minimizing the financial burden on the project. • Participation, both in-kind and in-cash, by communities reinforced buy-in into project.
What did not work so well?	<ul style="list-style-type: none"> • Requirement that community financial contribution be paid up-front meant that many projects did not go ahead as communities had not paid their contribution, leading to some wasted project preparation resources. • The lack of an adequate centralized monitoring and evaluation system means that it is difficult to track costs.

B.1 Overview of the financing approach

The PRAGUAS project aimed at improving water and sanitation services in small towns and rural areas and improving the capacity of the service providers for those services. The project name stands for *Programa de Agua y Saneamiento para Comunidades Rurales y Pequeños Municipios* (Rural and Small Town Water Supply and Sanitation Project). The focus of the first phase of the project (2001–2006) was on small municipalities with cantonal capitals of less than 10,000 inhabitants (152 out of a total of 219 municipalities were eligible). The project was financed by the central government (with the support of a World Bank loan), together with municipalities and the beneficiary communities. The project enabled about 140,000 people to gain access to improved sanitation over the course of 4.5 years. The average hardware cost of the solutions built was US\$355, although costs could be much higher depending on the level of service retained and the location (as transport costs can represent a substantial portion of total investment).

The PRAGUAS project had a strong up-front component to mobilize and organize communities to adopt sanitation (US\$46 was spent on software support per household, which represented 12% of the total costs of sanitation adoption).

The project provided an up-front fixed hardware subsidy to households for the construction of on-site sanitation solutions. The subsidy provided by the government through the project was capped at US\$210 in Phase 1 and increased to US\$315 in Phase 2 to reflect increases in the cost of a basic improved latrine. The level of subsidy was set to cover 70% of hardware costs for a basic improved sanitation solution, so as to ensure that poor families could afford improved sanitation. The remainder was to be financed by the communities in the form of labor, material, and cash. Households were free to choose a more expensive solution, but had to finance all additional costs over and above this fixed subsidy. Households could choose the level of service based on a broad catalog of technical solutions, ranging from improved traditional latrines to a basic sanitation unit (unidad básica de saneamiento or UBS) which integrates a shower, a sink, a flush toilet, and a septic tank. A majority of households chose this higher level of service, which means that the subsidy they received covered a smaller portion of their investment (about 60% on average).

This case study starts by providing some brief background on the country and sanitation context. We present the way on-site sanitation was provided through the project before analyzing the costs of such provision. We then evaluate the performance of the financing approach for on-site solutions, focusing on its impact on sustainable access to services, its costs, its effectiveness in the use of public funds, its poverty targeting, its financial sustainability, and its scalability. A summary section draws out key lessons learned from the project, looking at what seems to have worked and what did not work so well.

B.2 Country and sanitation sector context

B.2.1 Country context

Ecuador has a high number of indigenous people in rural areas who have limited access to basic services. Out of a total population of 13.8 million people in 2008, 35% were living in rural areas. Approximately 40% of the population was estimated to be below the poverty threshold, depending on which threshold is used. Thanks to substantial natural resources (including oil), Ecuador's GDP per capita stood at US\$3,335 in 2007 and US\$7,242 in PPP-adjusted-terms.⁶

B.2.2 Initiatives taken to increase coverage

Water supply and sanitation coverage in Ecuador have increased considerably in recent years. According to data from the Ministry of Housing and Urban Development (MIDUVI), water supply coverage in the country rose from 61% to 70% during the 1980s, and then fell to 67% during the 1990s. Sanitation coverage increased from 43% to 53% in the 1980s and rose to 57% percent in the 1990s.⁷ However, sanitation coverage in rural areas remains much lower, with 30% of the rural population lacking an improved sanitation solution in 2008.

The sector is characterized by: (i) low levels of coverage, particularly in rural areas; (ii) lack of quality and efficiency of service; and (iii) limited cost recovery and heavy reliance on financial transfers from national, departmental, and municipal government agencies.

⁶ International Monetary Fund, World Economic Outlook.

⁷ National Institute of Statistics and Census, Population and Housing Census.

B.2.3 Institutional set-up for sanitation

The Subsecretariat for Water Supply, Sanitation, and Solid Waste (SAPSyRS) in the Ministry of Urban Development and Housing (MIDUVI) is legally vested with sectoral policy-setting authority. However, as a result of decentralization, responsibility for water and sanitation service provision was transferred from the central government to the municipalities, including for the rural areas of the municipalities. Larger municipalities provide the services through dedicated *empresas prestadoras de servicios* (EPS), which are the local water and sanitation utilities. MIDUVI promoted the creation of municipal water and sanitation units (EMS) through the PRAGUAS project to help smaller municipalities provide assistance to water user committees that provide services in rural areas and to improve provision in the urban centers of the municipalities. There is no central regulatory authority.

B.3 PRAGUAS project design

This section presents the overall set-up of the PRAGUAS project, its approach, the area in which it has been operating, its institutional set-up and technical specifications, and the total costs and sources of financing, as well as the methodology for its subsidy design.

B.3.1 Project overview

PRAGUAS is a sectoral program financed through a World Bank loan. Its main objectives were to expand water supply and sanitation coverage by providing sustainable systems. From an institutional standpoint, the objective was to develop an institutional framework for the water and sanitation sector and to strengthen all participants with a view to the provision of efficient and effective services.

The original objective was to develop the program over the course of 12 years in three phases. Phase 1 started in June 2001 with a target budget of US\$50.25 million. It officially ended in October 2006, although all investments in the field had been carried out by the end of 2005. Phase 2 started toward the beginning of 2007 but was reduced in scope and prematurely terminated at the beginning of 2009, following a change in political leadership that affected all ongoing World Bank projects.

This case study is focused on Phase 1 (or APL1), which itself had four main components:

- Component 1: institutional strengthening of the ministry, municipalities, and operators;
- Component 2: investments in rural areas in water systems and sanitation solutions;
- Component 3: investment in small towns (*cabeceras cantonales*); and
- Component 4: program administration.

Rural municipalities, which according to the 1990 census had fewer than 10,000 inhabitants in their small towns, were eligible (152 municipalities). Framework agreements were concluded with 138 of these eligible municipalities (91% of them). The municipalities that did not conclude agreements were those that did not commit municipal resources for the execution of the program. In their view, the state should fully fund this sanitation investment.

Cost-sharing arrangements between the MIDUVI, the municipalities, and the beneficiary communities were incorporated in the design of the project. Only components 1 and 4 were wholly financed by the World Bank loan. Regarding Component 2 (investment in rural areas), the project started with a first phase of promotion and community development and designs for potential investments in water systems or on-site sanitation solutions. These designs, carried out by consultants, were completely financed by the PRAGUAS project.

For investments in on-site sanitation solutions, PRAGUAS provided a fixed subsidy of US\$210 per sanitation solution built. Communities were free to choose the level of service that met their needs from a broad catalog of technical solutions, provided that they would pay any additional cost for a higher level of service on top of the subsidy provided. The subsidy was supposed to cover 70% of the construction costs of the basic solution, while the communities were to bring the remaining 30% in labor, materials, and cash.⁸ This was to ensure that the poorest could have access to a basic sanitation solution, while those who wanted to could choose to invest in a more expensive solution. In practice, communities chose to build more expensive sanitation solutions.

⁸ Investments in water systems were to be financed through the World Bank loan (50%), 20% from municipalities and 30% from the communities themselves through labor or in cash.

B.3.2 Project institutional set-up

At the central level, the project was managed by the project management unit (or UGP, in Spanish), in direct collaboration with the SSAPyRS in MIDUVI. The project management unit was responsible for the financial and substantive management of the project, as well as its monitoring and evaluation, effective use of and accountability for loan resources, and provision to the World Bank and MIDUVI of progress reports based on the procedures agreed to with the Bank and reflected in the Operations Manual. In practical terms, the projected monitoring and evaluation systems were not used owing both to the fact that reports did not allow for the correlation and aggregation of report information and to the lack of interest among the technical and social intervention organizations in entering data in the system. As a result, monitoring and evaluation systems could not be used as a decision-making tool.

The EPAs (provincial water and sanitation units) in participating provinces participated in the project to assist the project management unit with execution activities in each jurisdiction. These provincial units promoted the project at the municipal level and assisted participating municipalities with the organization of EMSs and with pre-investment studies.

Of the municipalities involved in the project, 90% institutionalized their EMSs, which led to improved technical capacity among the municipal units. However, an ex-post evaluation found that many professionals were not properly trained and were quite unfamiliar with the PRAGUAS Operations Manual.

Implementation assistance agencies were responsible for strengthening EMSs by providing them with advice related to the selection and supervision of construction contracts and channeling appropriate information to the project management unit. These agencies were NGOs or engineering firms with experience in demand-based water and sanitation projects.

Technical and social intermediary organizations were hired for purposes of preparing engineering designs and planning rural investments. These were private enterprises or nongovernmental organizations.

The communities had to organize themselves in working groups in order to mobilize adequate financing and implement the projects. Such groups held meetings with the EMS and the PRAGUAS project staff to assess needs within the community, define which systems they wanted to go for, and mobilize resources in labor, material, and cash. The municipalities signed an agreement with the project when all financing issues had been resolved. In some cases, they needed to mobilize complementary financing from other sources, such as provincial councils.

B.3.3 Levels of service

A range of on-site sanitation systems was originally on offer as part of the project, ranging from improved traditional latrines to ventilated improved pit (VIP) latrines, aqua privies, flush latrines with a sink and shower, and “basic sanitation units” (UBSs), comprising a shower, a sink and a toilet (connected to a septic tank). The UBSs proved to be particularly attractive because they satisfied people’s demands in terms of improving overall hygiene levels. Communities rejected lower levels of service such as latrines, as they wanted to have a bathroom “like those in the city.” This was also made possible by the fact that the rural water supply systems developed under PRAGUAS included a piped water connection in the house. As for sanitation, communities were given a choice between different levels of water services, and the only level accepted by the indigenous populations was a water connection.

Given the determinant role of the community in structuring demand, a community usually had to select one type of sanitation solution for all households within that community. This allowed cost savings from group negotiations on materials but also meant that individual preferences could not be taken into consideration.

CAPITAL COSTS OF HYGIENIC LATRINES

Statistics on the actual capital costs of the sanitation solution were not available at the central level. The benchmark used for designing the project was US\$300 per sanitation solution, of which the PRAGUAS project was supposed to finance 70% (US\$210) and the local community 30%, either in-kind or in cash. In practice, however, there was considerable variation in capital costs from one area to the next, with transport costs being a very influential factor.

Community contributions are hard to value as they were mostly made in kind (labor, material, transport).

The consultant collected information on actual investment costs in a community in Chimborazo Province, where the community had selected UBSs as their sanitation solution of choice. This was a well organized community, which had been able to mobilize financing from a variety of sources and kept good records of the actual contributions made. In its case, the unit costs of an USB were US\$1,443.6 (including administrative costs at the local level).

Such an estimate is considerably higher than the estimated costs for the original project design. This may partly be due to the impact of regional factors and transport costs. The breakdown of costs and sources of finance are shown in Table B.1 below.

TABLE B.1. FINANCING OF UBS IN CHIMBORAZO, SOURCES OF FINANCE PER UBS

	Costs (US\$)	Source of finance	Share of financing	
			%	US\$
Total costs / UBS	1,443.6			
Total capital investment costs/ unit, of which:	1,255.31	Shared		
Labor	354.38	Community	24.55	354.38
Material	792.56	Municipality	5.73	82.77
		Provincial Council	28.39	409.79
		PRAGUAS	20.78	300.00*
Transport costs	95.35	Provincial Council	6.61	95.35
Equipment	13.02	Municipality	0.90	13.02
Design and administration (15% of direct costs)	188.29	Municipality	13.04	188.29

In the case of Chimborazo, the municipality contributed 19.68% (US\$284 per unit), according to an agreement with the PRAGUAS project, which covered design and administration costs, some material costs, and equipment. The provincial council covered a significant share of material costs and covered all transport costs. The PRAGUAS project covered the difference (US\$300). We did not receive an explanation as to why the subsidy was higher than the cap of US\$210 per household).

OPERATING COSTS OF HYGIENIC LATRINES

The operation and maintenance of on-site sanitation systems was the responsibility of individual households. Information on the operating and maintenance costs of hygienic latrines was not available at the project management level.

Below we provide an estimate of operating costs based on normal operation by a family of five.

TABLE B.2. ESTIMATED OPERATING AND MAINTENANCE COSTS OF A UBS

Categories	Monthly Cost (US\$)
Electricity	0.9
Water	2.25
Toilet paper	0.45
Soap	0.12
Cleaning supplies	0.15
Labor – cleaning time	1.11
Subtotal	4.98
Replacement and recurring costs (over five years)	
Valves and faucets	4.25
Cleaning of sewers	60
Total	64.25
Subtotal – Monthly cost	1.07
Estimated total – monthly	6.05

B.3.4 PRAGUAS Project costs

Total PRAGUAS project costs were US\$47.08 million between 2001 and 2006, against an original budget of US\$50.25 million. This underinvestment was due to the fact that some municipalities and communities did not bring their expected share of the investments. Component 2 (investment in rural areas) accounted for the bulk of the project, with 87% of total costs. Project administration costs accounted for 6% of total costs.

Table B.3 shows the costs of each component and the sources of finance, specifically the World Bank (WB), the central government (Govt), municipalities (Mun) and the communities themselves (Com). World Bank resources covered 67.9% of total costs. Municipalities contributed 13.3% and communities 14.7%. For community participation, it is likely that only the contributions in cash have been accounted for, since placing a monetary value on in-kind contributions requires an appropriate valuation of time contributed by communities. The central government's contribution was a mere 4.1%, allocated to the institutional reform component and to some infrastructure funding in rural areas. Total funds contributed by the World Bank loan and the central government amounted to US\$33 million. These funds were spent on the investment components 2 and 3 in the proportions shown in Table B.4 below. Investments in sanitation accounted for 25% of total investments in rural areas.

TABLE B.3. PRAGUAS APL 1 COSTS AND SOURCES OF FINANCE (2001-2006)

	Costs (US\$)	WB	Govt	Mun	Com
Component 1. Institutional strengthening	2,268,000	99%	1%	0%	0%
Component 2. Investment in rural areas	40,727,000	64%	4%	15%	17%
Component 3. Investment in small towns	716,000	100%	0%	0%	0%
Component 4. Project administration	2,984,000	88%	12%	0%	0%
Others (Emergency actions)	385,000	100%	0%	0%	0%
Overall total	47,080,000	68%	4%	13%	15%

TABLE B.4. BREAKDOWN OF PROJECT INVESTMENT COSTS (COMPONENTS 2 & 3)

Cost components	US\$	% total	
Designs	6,353,000	19	
Investments in rural areas	Water systems	18,461,000	55
	Sanitation	6,247,000	18
	Total	24,708,000	73
Water system investments in small towns	969,000	3	
Monitoring	1,858,000	5	
Total investments	33,888,000	100	

B.3.5 Sources of financing for household sanitation

According to project design, financing for household sanitation comes from two main sources: PRAGUAS project funds (out of the World Bank loan) and the communities themselves.⁹ An estimate of expenditure on household sanitation was not available at the level of the project management unit. In this context, we have attempted to estimate total expenditure on household sanitation from all sources based on a series of assumptions.

Central public funds covered approximately 85% of total costs.

Table B.5 below shows how we have allocated World Bank and government spending on the sanitation component in order to estimate the share of public funding for household sanitation. This calculation is not necessarily accurate, however. For example, at the design stage, the bulk of designs prepared may have been for water services instead of the 25% allocated to sanitation based on investment costs. We also assumed that 25% of institutional strengthening costs went toward sanitation, although there is no precise data on how these costs were used.

⁹ Municipalities were not supposed to play a direct role in the financing of on-site sanitation. However, they may have contributed to the costs in certain cases (as in the case of Chimborazo shown in Table B.1 above), when community participation was not sufficient to cover the difference between actual costs and the PRAGUAS subsidy.

TABLE B.5. TOTAL ESTIMATED COSTS OF SANITATION COMPONENT (WORLD BANK AND GOVERNMENT)

Cost component	Share allocated to sanitation	Value (US\$)
Component 1: Institutional strengthening	Estimated at 25% (like investments)	567,000
Component 2: Designs	Estimated at 25% (like investments)	1,588,000
Sanitation investments in rural areas	All	6,247,000
Monitoring	Estimated at 25% (like investments)	465,000
Component 4 – Administration	Estimated at 25% (like investments)	746,000
Total: World Bank + government		9,613,000

The beneficiary communities have contributed around 15% of the total costs, to which in-kind contributions must be added (but are difficult to value).

We sought to assess community contributions for sanitation in order to estimate the total costs of the sanitation component, as shown in Table B.6 below.

TABLE B.6. ESTIMATED COSTS OF THE SANITATION COMPONENT – ALL SOURCES

	US\$
WB + Govt (hardware)	8,300,000
WB + Govt (software)	1,313,000
Community contributions – hardware - (25% of total)	1,738,000
Grand total	11,351,000

Note: We have assumed that municipalities’ contributions were mostly focused on water supply, in line with the original project design (see Section B.3.1). In some cases, however, as in the example in Chimborazo in Table B.1, some municipalities will have contributed to the financing.

As mentioned above, the project has not kept track of the total contributions made by municipalities and communities. Given that many of these contributions were in-kind, there was no attempt to try and value them. The only estimate of the contributions is a global estimate for the entire project: we have assumed that 25% of total

community contributions went to household sanitation, in line with the assumption for the other investments.

However, no information is available on community funding broken down by community and distinguishing between labor, in-kind, and monetary contributions. Owing to this limitation, it is not possible to draw a conclusion with regard to the level of community participation. It is likely that community participation in-kind has not been fully accounted for, due to the absence of a methodology at the project level to value such participation. For example, in some cases, those who own a vehicle would make the vehicle available for transporting materials, but this cost is not counted as community participation.

Community monetary contributions are extremely important, not only as a source of financing but also as an instrument for allowing the population served to take ownership of the project, given that community labor (*la “minga”*), a traditional institution in Ecuador by means of which communities provide labor for project-related construction, is not sufficient.

Although there may be financial limitations with respect to monetary contributions from communities, other factors could be impeding the possibility of a bigger monetary contribution by communities to project execution. One of these factors may be the traditional application of paternalistic or clientelistic policies that have led low-income communities to become used to receiving benefits from the state in exchange for electoral support. Problems may also exist with the organization of communities, a lack of trust in all levels of government, along with insufficient confidence that their resources will be properly used by project administrators. Added to this are internal conflicts among groups within communities. In this regard, it should be mentioned that adequate resources are not made available to communities in a timely fashion, a factor that discourages the contribution of resources by the community. Limited levels of education in rural communities with scant resources may also fuel mistrust, given the limited control they have over processes and limited ability to demand accountability.

In order to mitigate the risks associated with the lack of monetary resources mobilized by the community, only those municipalities that could demonstrate such mobilization were considered, and each municipality could propose

small numbers of communities for consideration once they had strengthened their capacity to mobilize resources from their communities. Providing assurances to communities that they would be furnished with adequate services was an incentive for them to make monetary contributions. As a result, one can safely assume that community participations have been paid in the areas where there has been investment, although it is not possible to place a value on the full extent of such participation.

B.3.6 Subsidy design

According to project design, the subsidy from the PRAGUAS project was supposed to account for 70% of estimated unit costs of a basic sanitation solution, or US\$210 based on estimated costs of US\$300. This subsidy is fixed, independently of the actual costs of the investment, and the community must finance the remainder out of its own resources or through other sources. The underlying assumption was that those with a lower level of income could be covered with a basic solution and receive the full 70% subsidy, whilst those with a comparatively higher income could select a higher level of service, with a higher investment cost, and thus receive a lower subsidy in percentage terms. The subsidy amount also did not vary during the course of the project, even though there was inflation during that period. For APL2, the same subsidy design was kept but the subsidy amount was increased to US\$315.

The subsidy is paid up-front to the project and is placed on a single bank account managed by the Community organization (under the supervision of the EMS and the EPPs), together with all other funds brought to the project. All cash contributions are made up-front for the project to start.

B.4 Evaluation of the PRAGUAS project's performance

In this last section, we seek to evaluate the project's performance at extending household sanitation based on criteria set out in the common methodology for the project.

B.4.1 Impact on sustainable access to services

In total, 28,644 sanitation solutions were built, which benefited approximately 143,320 inhabitants (based on five people per household)

At the design stage, designs were carried out for a total of 95,510 households or 514,500 people. Only a limited set of these original designs were effectively executed, since in some cases municipalities did not meet the requirement to finance their share of the investment or communities did not get organized to mobilize resources. In a number of cases, PRAGUAS contracted designs for work before establishing the work's operational and administrative feasibility or securing municipal and community contributions, resulting in a significant waste of resources.

Following the initial design stage, 381 contracts were concluded for 844 communities. Sanitation solutions were built in 154 communities, and combined sanitation and water systems were built in 229 communities. In total, 383 communities invested in sanitation through the PRAGUAS project, which accounted for 45% of the communities that had signed an agreement with the project at the design stage. In addition, more than 660,000 inhabitants took part in social development activities focused on system administration and O&M as well as hygiene education.

Overall (i.e., for water and sanitation), the project exceeded its targets in terms of population served, reaching a total of 417,150 beneficiaries from water and sanitation projects, measured against an original target of 350,000.

According to the project implementation report, it was estimated that 37% of households selected a UBS, 40% selected a toilet and sink package, and 23% improved their pour-flush latrines.

The UBS has proven to be an important success, although it was not possible to obtain a detailed breakdown of the type of sanitation solutions that were chosen by the populations. Many families have improved their UBS with ceramic tiles, water heaters, and so on. Delegations of specialists from Peru and Paraguay struggling with traditional latrines visited Ecuador to learn from this experience.

No information is available on the number of sanitation units that continue to function.

An ex-post evaluation has not been done of the PRAGUAS program to assess the sustainability of investments. However, research done on a sampling of 40 subprojects that had been carried out 18 months earlier shows a complete willingness by the communities to maintain the projects in instances where they were required to provide resources, compared with those projects that were fully funded by grants.

B.4.2 Costs

Total average costs of sanitation solutions stood at approximately US\$400, including US\$46 for software costs.

These cost estimates are subject to considerable uncertainty, given the lack of detailed information at the central project level and the absence of a breakdown between total water and sanitation investments. As a result, we have estimated costs based on a number of assumptions, which are all prone to error (see section B.3.5 above for more details). Most crucially, in-kind contributions from the communities have not been fully reflected for lack of a methodology to account for them at the level of the project itself.

Software costs (including project management, community strengthening, and social and technical supervision) accounted for approximately 12% of the total initial costs. Information from specific projects indicates that, if all costs are taken into account, the unit costs could be much higher, up to US\$1,443 in the case of a community in Chimborazo province, as shown in Table B.1 above.

The total hardware costs accounted for approximately 15% of the average household income in the project area and 21.5% of income for the poorest households.

As mentioned above, these costs are likely to be an underestimate, and it is probable that hardware costs represented a much higher share of the local population's incomes, hence the need for mobilizing additional sources of finance (for example from the *Consejos Provinciales*).

According to our estimates, the hardware subsidy from the PRAGUAS project covered about 60% of the hardware costs, or even a lower percentage since this subsidy was fixed when actual costs could vary substantially.

Annual operating costs were estimated at approximately US\$72 per year per household.

This relatively high cost of operation reflects the fact that the standard of the UBS is relatively high and requires water to be operated. Time spent cleaning the UBS was also incorporated, although admittedly this can be done by the family itself with no monetary outlay.

Operating costs accounted for 3% and 4.4% of household annual income, for average households and the poorest households, respectively

Similarly, operating costs, although quite high, are below an acceptable affordability threshold, especially given that some of the tasks can be performed without a monetary outlay.

B.4.3 Effectiveness in the use of public funds

From the public-sector point of view, the increased access/public funding ratio was low, with only 2.9 households served per US\$1,000 of public funds spent.

This relatively low ratio reflects the relatively high cost of the sanitation solutions built, providing a good level of service for hygiene and sanitation.

The leverage ratio for the project is low: US\$1 of public funds mobilized about US\$0.2 in community participation.

This is likely to be an underestimate of the full amount of community participation, due to difficulties in valuing in-kind contributions and variations in the amounts actually invested by households, for which no actual data has been compiled in a comprehensive manner. The data obtained for the case of Chimborazo indicates that, while the actual investment costs were higher than those in the program design, the gap between the actual costs and the central government's subsidy was covered by the municipality and the provincial councils, which effectively amounts to an additional subsidy. This indicates that even if the communities selected a higher level of service, they did not necessarily pay for it themselves because they tried to mobilize funding from other external sources.

B.4.4 Poverty targeting

The project deliberately targeted poor rural areas and small towns.

As set forth in the project's objectives, its beneficiaries were rural inhabitants living in municipalities whose small towns had a population of up to 10,000. One hundred and fifty-two municipalities, of a total of 219, were eligible. The project also placed special emphasis on communities living close to southern and eastern borders (in light of the fact that these areas have high levels of poverty) and on areas with high numbers of indigenous people.

According to PMU reports, the selection of municipalities to participate in the project was based on three factors: low service coverage, high poverty indicators, and interest shown by communities in improving services. The last factor was a prerequisite for a project whose criterion for the provision of services was based on demand by the beneficiary population.

Based on one PMU report, which mentions ex-post research on 1,752 homes, the conclusion was drawn that the vast majority of beneficiaries were poor. According to this study, the income of the entire community was below the poverty line, estimated by the World Bank at US\$2.13 per day per capita. Average family income of the community living in the project area is estimated at US\$1.43 per day, equivalent to an average annual family income of US\$2,363 (based on an average family size of 4.59 persons). At the national level, daily per capita income corresponding to extreme poverty was estimated at US\$1 per day, which is equivalent to an annual family income in the project area of US\$1,652.

The PRAGUAS subsidy for hardware costs helped lower the household contribution to 2.6% and 3.7% of household income, for the average and the poorest households, respectively.

Given the high level of subsidy, the cash contribution expected from households was rather modest, although households would need to complement this with in-kind contributions.

B.4.5 Financial sustainability

Public funds financed around 85% of the total initial costs, including hardware and software. This means that such investments cannot be considered in the absence of external support.

Operating costs are solely the charge of households. The financial sustainability of operations is therefore possible as long as the households can keep repairing the installations and carrying out recurrent maintenance tasks, such as emptying the pit.

B.4.6 Scalability

Coverage in rural Ecuador remains very low, with 3.4 million people lacking sanitation in 2008 (or 70% of the rural population).

Extending the PRAGUAS approach to cover all of these populations would cost approximately US\$231 million. This appears to be achievable, when compared to the sums assigned to water and sanitation projects in the national budget. However, the early termination of PRAGUAS 2 means that the prospects for extending the PRAGUAS approach in its current project form appear slim.

B.5 Summary evaluation

In this section, we summarize the evaluation of the financing approach based on our set of criteria and draw practical implications for the applicability of this financing approach

In terms of impact on sustainable access to services, the PRAGUAS project was successful at delivering attractive sanitation solutions to about 30% of the population in its project areas, which were rural areas with high incidence of poverty. Plans to increase coverage further using a similar approach were foiled following the Government of Ecuador's decision in 2009 to reduce World Bank activities in the country.

In cost terms, the sanitation solutions introduced were relatively costly (about US\$350 for hardware costs alone and US\$400 including software costs) but met a real

need within the population to improve hygiene levels in an integrated manner, with a toilet, a sink and a shower. Possibilities offered to communities to contribute a high percentage in-kind (up to two-thirds of their total participation) reduced the need for cash outlays and built on the local tradition of community labor (“*la minga*”) to carry out public works around the villages.

In terms of effectiveness in the use of public funds, the recorded information indicated that public funds leveraged a limited amount of private funds (with a 0.2 leverage ratio), although the private funds actually invested were likely to have been underestimated since it was difficult to account for in-kind contributions and many communities selected a higher level of service than the basic one used in project estimates.

In terms of poverty targeting, PRAGUAS targeted poor rural areas and small towns. An ex-post evaluation of the project showed that a large majority of beneficiaries were indeed poor.

In terms of financial sustainability, the project is highly dependent on public funds, which funded approximately 85% of the total costs (although this calculation does not fully reflect the in-kind contributions made by the communities).

Scaling-up the PRAGUAS approach to cover the 70% of the rural population still without improved sanitation would require about US\$231 million. Scaling up the project approach is possible, given that Ecuador is rich in natural resources, and will primarily depend on political will.

WHAT SEEMS TO HAVE WORKED?

The choice of levels of service on offer proved very attractive to the target populations, which often chose the service level that brought the most benefit from hygiene improvements, namely the UBS. The broad catalog of technical options offered with a fixed subsidy for all options meant that households could choose the most appropriate option to meet their needs without imposing an undue financial burden on the project. The fixed subsidy improved the poverty targeting, since the subsidy represented a higher percentage of hardware costs for more basic sanitation solutions than for more expensive ones.

Participation in-kind and in-cash from beneficiary communities reinforced their interest in the project and meant that they were more willing to use and maintain the facilities built through the project. The monetary contribution expected of beneficiaries remained affordable, at 2.5% to 3.5% of their annual incomes (depending on income levels) and meant that no credit mechanisms appeared to be necessary in order to spread such contributions over time.

AND WHAT DID NOT WORK SO WELL?

Lack of coordination with municipalities meant that a much higher number of designs were prepared compared to the number of works actually carried out. This was due to difficulties in identifying up-front which municipalities and communities would come forward with their participation. Although the subsidy was paid up-front into a shared account managed by the community (under project and municipal supervision), the works would start only once the contributions from the community (and in some cases, from the municipalities) had been paid. This ensured that all contributions had been paid and that sufficient resources would be available to complete the works.

The lack of an adequate, centralized monitoring and evaluation system meant that it was difficult to track costs. In several cases, cost aggregates were done for water and sanitation in conjunction, and it was not possible to isolate the sanitation element. In the absence of a baseline, it was not possible to track what the original level of coverage was and what was the contribution from the project. Moreover, the project only tracked its own costs (US\$210 per on-site sanitation solution) but did not attempt to value all other contributions, in-kind or in-cash.

Annex C - Maharashtra case study

Case study written by Rajiv Raman and Sophie Trémolet

OVERVIEW OF MAHARASHTRA CASE STUDY (TSC PROJECT)

Key facts	
Project name	TSC: Total Sanitation Campaign
Project objectives	Create an Open Defecation Free (ODF) and clean environment in rural villages, at household and institutional levels (including in schools, nurseries, and community centers)
Public financiers	Government of India, with funding split between federal and state governments
Scale	About 21 million people reached in rural areas throughout the state
Time frame	Program years: 2000 to date / Study period: July 2000 to November 2008
Level of service	Improved latrines (demand-led, leaving vast choice of options)
Summary of financing approach	
Software support	<ul style="list-style-type: none"> • Software support for community mobilization; information, education and communication; capacity building; and hygiene education • Outcome-based financial rewards to villages reaching ODF status, to be spent on sanitation investments • Software mark-up = 7% of total costs of sanitation solution
Hardware subsidies	<ul style="list-style-type: none"> • Outcome-based hardware subsidies for below-poverty-line (BPL) households (paid once village reaches ODF status “in recognition of household achievement”) • Maximum subsidy: US\$24 per household (about 22% of hardware costs) • Hardware subsidies = 22% of public funds
Access to credit	<ul style="list-style-type: none"> • Some commercial banks offer microcredit to help finance sanitation investments, but this does not form an integral part of the program.
Summary evaluation	
Impact on sustainable access	<ul style="list-style-type: none"> • 38% of population in project area gained access to sanitation or improved existing sanitation solution (a 10% increase in coverage per year) • Evidence of use and adequate maintenance, high satisfaction levels
Costs	<ul style="list-style-type: none"> • Average hardware costs: US\$208 (27% of lowest quintile income) • Operating costs: US\$4 per year (1.1% of lowest quintile income)
Effectiveness in the use of public funds	<ul style="list-style-type: none"> • High leverage ratio: 10.3 • High “increased access / public funding” ratio: 50 latrines built per US\$1,000 in public funds
Poverty targeting	<ul style="list-style-type: none"> • Means-tested based on national income classification • Moderate error of inclusion (5 to 10% were not genuinely eligible) but relatively high error of exclusion (10 to 20% of poor families did not get the subsidy)
Financial sustainability	<ul style="list-style-type: none"> • Public funds = 9% of total costs of sanitation adoption (high sustainability)
Scalability	<ul style="list-style-type: none"> • Already scaled-up throughout the state; budget is affordable at state level

OVERVIEW OF MAHARASHTRA CASE STUDY (TSC PROJECT) CONTINUED

Some lessons learned

What worked?	<ul style="list-style-type: none"> • Community mobilization has been a main driver for household investment. • Monetary rewards at village level appear to have been effective. • Outcome-based subsidies (at village and household level) have helped to meet the needs of the poor and shift the mentality of the program.
What did not work so well?	<ul style="list-style-type: none"> • Long-term sustainability of investments, driven by the need to meet the ODF target and associated monetary rewards, is in question. However, annual campaigns help in maintaining high levels of cleanliness throughout. • Only sporadic initiatives to increase credit for poor households. So far, credit has mostly benefited above-poverty-line (ABL) households.

C.1 Overview of the financing approach

The Total Sanitation Campaign (TSC) is a nationwide program for which implementation varies from state to state. This case study focuses on how the TSC has been implemented in the State of Maharashtra. The approach is based on a CLTS (Community Led Total Sanitation) approach to promoting sanitation, combined with small hardware subsidies for the poorest households and monetary rewards for villages that achieve overall cleanliness objectives. Since being introduced in Maharashtra in 2000, the approach has incentivized more than 21 million people to adopt improved sanitation. On average, the hardware cost of the sanitation solution built was US\$208.

Under the TSC program, software activities are conducted to generate demand and village-level mobilization. Separately from the TSC, monetary rewards are provided to villages that reach ODF status. The Nirmal Gram Puraskar (NGP) is a national program that provides one-off monetary rewards from the central government to qualifying gram panchayats or GPs (the smallest units of local government in India). Payments are based on a set of criteria (which include, among others, 100% sanitation coverage of individual households and being totally free from open defecation) and are made following a thorough verification process. These rewards can be anywhere between US\$1,250 and US\$12,500 per GP, depending on the population. GPs can use the cash incentive to improve and maintain sanitation facilities in their respective areas with a focus on solid and liquid waste disposal and maintenance of sanitation standards. In addition, the State of Maharashtra has introduced a number of state-based campaigns, such

as the Clean Village campaign (Sant Gadge Baba) which takes place annually and encourages maintaining overall cleanliness in the villages. In total, approximately US\$15 was spent on software support per household (including the costs of the financial reward schemes), which represented about 7% of total sanitation adoption costs.

Hardware subsidies are provided to below-poverty-line (BPL) households after the village has been declared ODF. As they are outcome-based, they are referred to as “incentives” in the TSC guidelines, provided to households “in recognition of their achievements.” The initial level of subsidy was Rs 500 (US\$10) per BPL household, although this was raised to Rs 1,200 (US\$24) in March 2006 to reflect cost inflation. The subsidy was initially intended to cover 80% of the hardware costs of a basic sanitation solution for BPL households, but in practice it covers only about 20% of hardware costs as most BPL households chose to invest in a higher level of service than the basic minimum.

Finally, in some areas access to credit has been provided in order to speed up the process of adopting sanitation. In those districts where it was systematically introduced, it has supported stronger demand for sanitation. However, these products tended to be more widely available in comparatively richer districts and largely benefited above-poverty-line (APL) households in those districts.

This case study starts by providing some brief background on the country and sanitation context. We present the way in which on-site sanitation was provided through the project before analyzing the costs of such provision. We then

evaluate the performance of the financing approach for the on-site solution, focusing on its impact on sustainable access to services on costs, its effectiveness in the use of public funds, and its poverty targeting, financial sustainability, and scalability. A summary section draws out key lessons learned from the project, looking at what seems to have worked and what did not work so well. We assess the performance of the financing arrangements in the state as a whole and in three selected study districts: Kolhapur, Nashik, and Chandrapur.

C.2 Country and sanitation sector context

C.2.1 Country context: Maharashtra

Maharashtra is India's third largest state in area and the second most populated. In 2001, the state had a population of 96,752,247 (19,521,809 households), with 42 % being resident in urban areas (compared to a 28% urbanization rate at the national level), making this the second most urbanized state in the country. Mumbai, the capital city of Maharashtra, is India's largest city and a prime center of economy and culture. Maharashtra is India's most developed state, contributing 15% of the country's industrial output and 14.7% of its GDP. India's GDP was US\$941 per capita in 2007, according to the International Monetary Fund's World Economic Outlook, and US\$2,563 in PPP-adjusted terms.¹

C.2.2 Initiatives taken to increase coverage

Up until the latter half of the 1990s, progress on the rural sanitation front in India had been abysmally slow. Although Maharashtra is known for its high levels of industrialization and urbanization, the state has had very poor sanitation indicators historically. In the late 1990s, about 20% of the rural population had access to safe sanitation, despite several campaigns to address this issue in the previous decades.

Comprehensive efforts for achieving improvements in the rural sanitation situation started with the Central Rural Sanitation Program (CRSP) in 1986, a nationwide program for rural sanitation. However, this focused purely on providing household sanitation facilities and relied mainly on subsidies to “generate demand” for household toilets; it had only limited impact on coverage, with studies indicating low usage by households.

In 1999, a new approach was adopted (the RCRSP) which advocated a shift from a high-subsidy to a low-subsidy regime, greater household involvement, and demand responsiveness. It promoted a range of toilet options to promote increased affordability, and it placed strong emphasis on IEC (information, education and communication) and social marketing. The RCRSP was piloted in selected states, and after due review it was launched as the Total Sanitation Campaign (TSC) at the national level in 2001. The key intervention areas are individual household latrines (IHHL), School Sanitation and Hygiene Education (SSHE), Community Sanitary Complex, *Anganwadi* toilets supported by Rural Sanitary Marts (RSMs), and Production Centers (PCs). The TSC was the culmination of reviews and learning from sanitation initiatives from 1981 to 2000, which were either national, limited to certain states, or limited to only a few villages. In Maharashtra, the TSC started with four districts in FY 2000, and all of the 33 rural districts had initiated the TSC by FY 2004.

In 2004, ODF was introduced as a goal post with financial incentives in the form of the NGP, a scheme to reward GPs that have achieved overall cleanliness (the “Nirmal Gram”).² This was based on the realization that rural local government institutions are best placed to motivate the communities/households to change their behavior and convince them to spend their own resources to ensure better sanitary outcomes. In addition, an output-based aid approach to the hardware subsidies provided to poor households was introduced at that stage, with such subsidies described as ex-post “incentives” and provided to the poor households once they have built a latrine. This condition was strengthened in the State of Maharashtra, where the subsidy can be provided only when the village as a whole has been declared ODF.

By November 2008, the TSC was operational in 590 districts of the country, leaving 28 rural districts that are yet to take up the campaign. After four rounds of NGP awards, 16,616 GPS (7% of the total) had achieved ODF status across the country. Maharashtra has led the states in achieving positive sanitation outcomes, as it has consistently had the largest number of NGP awardees and accounted for 37 % (6,131)

¹ International Monetary Fund, World Economic Outlook Database, April 2009. <http://www.imf.org/external/pubs/ft/weo/2009/01/weodata/index.aspx>

² See Section C.3.5 for more details on the NGP program.

of all the ODF GPs by November 2008. By then, it had achieved NGP in 22% of its GPs, the highest proportion among large states.

The state approach focusing on ODF outcomes is often cited as the reason for the relatively better performance of rural sanitation in Maharashtra. Initiatives driven by state subsidies, from 1997 to 2000, only led to limited results, with more than half of the households not using the toilets constructed. In 2000, the state devised a set of campaigns that aimed at leveraging the reputation and status of communities to move towards sustainable behavior change outcomes. While the TSC is the core campaign to create sanitation facilities, the State of Maharashtra initiated two additional campaigns and a competition to complement this by creating a broader awareness of sanitation and hygiene issues. These campaigns have created a competitive atmosphere among the GPs, and the activity calendar is a major driver in keeping the issues current and in public memory (see Box C.1 in Section C.3.5 for more details).

C.2.3 Access to sanitation in rural areas

In India as a whole, there has been significant progress in household sanitation provision, with rural sanitation coverage rising from 22% in 2001 to 41% in 2008, although only 18% had access to improved (and not shared) sanitation facilities, according to the National Family Health Survey published in 2006. However, the goal of eradicating open defecation is far from being achieved, as 59% of households still do not have sanitation facilities and 93% of GPs still need to achieve ODF.

In Maharashtra, rural sanitation coverage rose from 18% in 2001 to approximately 49% in November 2008, although other statistics show higher coverage levels. Since 2005, Maharashtra has made significant progress in the provision of sanitation facilities to rural households. Institutional sanitation facilities have also progressed significantly in schools and anganwadis (nurseries for non-school-age children). However, the state has still a long way to go towards achieving an ODF rural Maharashtra.

C.2.4 Institutional set-up for sanitation

Policy direction comes from the national government, which also provides a very significant share of total funding. Progressively larger allocations have been made for water supply and sanitation in the various Five Year Plans.

The nodal agencies for rural and urban water supply and sanitation are the Department of Drinking Water Supply (DDWS) inside the Ministry of Rural Development and the Ministry of Urban Development and Poverty Alleviation.

The primary responsibility for providing drinking water and sanitation facilities rests with the state governments (and with the local bodies in urban areas), as sanitation and drinking water are state subjects according to the Indian constitution.

In rural areas, the Panchayat Raj Institutions (PRIs), are charged with statutory responsibilities for sanitation. The PRIs are a three-tier structure of local government, including district, block and GP. For sanitation, the key structures are the 612 districts and the 245,394 GPs throughout India. The GPs are demarcated based on a population norm decided by the state and would consist of a revenue village or a set of revenue villages (if villages are small in size). The elected governments for each tier – panchayat, block and district – are devolved certain powers in planning and administration, depending on the legal provisions in the state.

C.3 TSC program design

This section presents the overall set up of the TSC program, its approach, institutional set-up, levels of service, total program costs, sources of finance, and subsidy design.

C.3.1 Program overview

The TSC's overarching goal is to create an ODF and "clean" environment. It focuses on the sanitary confinement and safe disposal of human excreta within the physical environments of the households and institutions present in the village (such as schools and *anganwadis*, nurseries for very small children). The approach is community-led and people-centered and focuses on creating awareness and generating demand for sanitary facilities in houses and schools and for maintaining a cleaner environment. Strategies are developed to motivate individual households so that they realize the need for good sanitation practices and, as a result, not only construct toilets but also have the members of the family use them. In addition, the program aims at modifying personal hygiene behavior. Over time, the provision of toilet facilities has been widened to cover public places, with the ultimate objective of eradicating the practice of open defecation.

The TSC places strong emphasis on information, education and communication (IEC), capacity building, and hygiene education for effective behavior change with the involvement of PRIs, CBOs, NGOs, and others. Measures to raise awareness levels and improve hygiene behavior are advocated along with “building capacities” of program delivery staff and other stakeholders through human resource development initiatives. The operational strategy focuses on involving multiple stakeholders and achieving a convergence of development programs at the GP level for all activities linked to sanitation (like housing for the poor).

Supportive measures to help households build their own facilities have been introduced, such as the supply of the necessary hardware and skill-sets for toilet construction through to the local manufacture/procurement and selling at cost-effective prices, training of a local pool of masons in construction, and facilitation of the construction process. Small subsidies are provided to BPL households only once the GP as a whole has reached ODF status.

C.3.2 Program institutional set-up

The TSC is a national program initiated, directed, and monitored by the TSC Cell inside the Department of Drinking Water Supply within the Ministry of Rural Development of the national government. Project sanction and monitoring are the main responsibilities at the national level. Each state is responsible for defining program management strategies and necessary support systems under the broad guidelines prescribed at the national level. While the program delivery strategy in all states follows the overall TSC framework, the structure and institutional linkages vary with the situation of local-government systems.

In Maharashtra, the Water Supply and Sanitation Department is the nodal agency in charge of state policy and coordination on issues of drinking water and sanitation across both rural and urban domains. It provides an overall strategic direction for the implementation of the programs in terms of objectives, content, and methods for capacity building of different stakeholders at the district and sub-district levels. It also carries out regular monitoring of progress and assists in knowledge-sharing. Program management responsibilities

were transferred to an independent project management unit, the Reforms Support and Project Management unit.

District Sanitation Cells (or TSC cells) have been set up to plan and organize the implementation of the TSC through the GPs. They have technical specialists (engineers), as well as specialists in community mobilization, IEC, and capacity building who are supported by an administrative section.

The GPs are charged with the core tasks of getting the households to adopt safe sanitation. The GPs take the decision to become ODF and are in charge of implementing this decision. To do so, they are in charge of conducting a baseline survey and planning on how to achieve ODF. They would then prepare a list of households to receive incentive on completion and put this up through the District Sanitation Cell. Later on, the GPs facilitate the construction of household toilets, including organizing material supply, masons, and advising on design. They are in charge of convincing households to invest and finding alternatives for the poorest that are not willing or unable to invest. Once 100% sanitation provision is reached, they are responsible for declaring such status, organizing the assessment of the village based on NGP parameters, and making claims for BPL household incentives.

C.3.3 Levels of service

The TSC advocates the provision of affordable options, with a particular emphasis on the twin-pit leach-pit pour-flush design. The program advocates the use of local materials, bulk production of viable components, alternate supply chain systems for cost economy, and availability of a ladder of design options that allow the household to move up at an affordable pace.

CAPITAL COSTS

The estimated cost of construction for alternative options varies from one district to another, depending on the availability of building materials and their landed costs, as shown in Table C.1 below.

Although the septic tank option is significantly more expensive, it is preferred by the richer households (and even some of the poorer ones) mostly due to their having seen similar designs in urban spaces or in other households and

TABLE C.1. ESTIMATED CAPITAL COSTS FOR SANITATION OPTIONS (2008 US\$)

Study District	Chandrapur	Kolhapur	Nashik
Basic unit			
Single-pit leach pit	49	65	53
Twin-pit leach pit	100	133	110
Septic tank	250	272	230
Superstructure options			
Three-sided brick wall with cloth curtain for door	38		37
Brick wall, thin concrete door, and asbestos roofing sheet	51	60	52
Brick wall with colourwash and stone flooring tiles		68	67
Average total cost of sanitation facility for BPL household	100	125	106
Average total cost of sanitation facility for APL household	251	350	149

Note on methodology: Analysis of primary data as of March 2008, converted at US\$1= Rs 50. This table shows point estimates based on field data gathered in the study districts. All costs have been fully monetized, including labor costs even when labor was provided by households themselves. These costs are not the result of a comprehensive survey and as such, they may be subject to a number of biases, including sampling bias. For example, costs for Kolhapur are on the high side, which may be a reflection of the households surveyed. Information was gathered in March 2008, at a period of high input prices following a squeeze in building material supply in rural areas owing to a reported construction boom in urban areas. Average costs are weighted averages based on the proportion of facilities by type built in each study area.

to trust in the reliability of that option. This option is also trusted and is also possibly the only option known by bankers, credit scheme evaluators, and others. The superstructure is where the household can economize significantly or decide on staggering the expenditure. A relatively temporary structure can actually be built with material collected or borrowed without incurring any monetary outgo.

OPERATING COSTS

Operating costs are minimal, at Rs 10 to Rs 20 per month, which works out to approximately US\$4 per year. There were no reported cases of pits filling up and needing pit-emptying. There were some reports of households starting to use the second pit, even though the advocated reuse of pit contents (after six months of nonuse) as agriculture compost is not reported. There is a reported preference to provide for larger pits than the design specifications call for, which could well explain the lack of reports about fill-up. Operating costs for septic tanks are slightly higher, due to the need for regular cleaning. Such maintenance does not appear to have been required for the time being in the newly installed septic tanks. Estimated costs for such activities in urban centers are around Rs 600 to Rs 800 per event.

C.3.4 Total TSC program costs

The total costs for the TSC in Maharashtra are shown in Table C.2 below. These include the prizes delivered under the NGP awards and the costs of associated campaigns specific to Maharashtra, such as the SGBSA and the Rashtrasant Tukdojee Maharaj (RTM) Competition (the HMA, or Open Defecation Free campaign, is under the TSC without a separate budget line).

Hardware costs (including hardware for household sanitation, but also institutional sanitation and public facilities) accounted for 47% of total TSC costs and all other “software” costs for 53%. The financing of hardware subsidies for BPL households accounted for 15% of these total costs.

We defined software costs broadly to include anything but hardware costs.³ They comprise administrative costs, expenditure on IEC, training and capacity building of TSC staff, motivators and identified stakeholders, and revolving funds provided for setting up alternate delivery systems (through Rural Sanitary Marts and Production Centers) as well as supporting microcredit institutions to provide short-term finance for sanitation.

3 Administrative and management costs have been included as software in all case studies, since it is sometimes difficult to separate them out, for lack of detailed information.

The next section examines in more details how household sanitation facilities are financed, including all sources of finance such as household finance.

C.3.5 Sources of finance for household sanitation

Table C.3 below shows the total funds spent on financing household sanitation by both public and private sources in the State of Maharashtra during the TSC campaign. On the whole, this table shows that households financed more than 90% of the total costs of investing in household sanitation (including hardware and software) whereas public funds accounted for

less than 10% of the total. Hardware costs account for 93% (as this includes household investment) and software costs for a mere 7%. We review the main characteristics of each source of financing in the following sections.

Public funds account for less than 10% of the total costs of household sanitation.

TSC funds account for about 3% of household sanitation costs, including hardware and software. To reach that estimate, we took into account all TSC funds spent on

TABLE C.2. EXPENSES ON TSC IN MAHARASHTRA UP TO NOVEMBER 2008

	2008 US\$	% total
HARDWARE COSTS (TOTAL)	50,939,000	47
Household sanitation (hardware subsidies for BPL households)	17,936,000	15
Institutional sanitation facilities (schools and anganwadis)	29,812,000	25
Provision of common/public facilities	3,191,000	3
SOFTWARE COSTS (TOTAL)	66,391,000	53
TSC software components & program management	53,865,000	9
IEC	6,696,000	6
Administration	2,329,000	2
Others (Start-up + Rural Sanitary Marts/Production centers)	1,881,000	2
NGP incentives	42,958,000	37
State campaign (SGBGSA) and RTM CVC Prizes	12,528,000	11
Prizes	10,237,000	9
Publicity/Others	2,290,000	2
TOTAL	117,330,000	100

TABLE C.3. FUNDS SPENT BY PUBLIC AND PRIVATE SOURCES ON HOUSEHOLD SANITATION (US\$)

	Hardware	Software	Total	% of total
PUBLIC FUNDS				8.8%
TSC expenditure on household sanitation	17,936,000		17,936,000	1.9
TSC expenditure on support activities		9,815,000	9,815,000	1.0
NGP incentives		42,958,000	42,958,000	4.6
SGBSA state campaign		2,290,000	2,290,000	0.2
RTM CVC Prizes		10,237,000	10,237,000	1.1
HOUSEHOLD FINANCE				91.1
BPL households	124,514,000		124,514,000	13.2
APL households	733,036,000		733,036,000	77.9
TOTAL	875,486,000	65,300,000	940,786,000	100.0

Note 1: The software costs shown in this table only include those of the TSC campaign. In addition, it is important to note that district, block and village-level officers spend considerable amounts of their time on supporting sanitation. We did not obtain specific figures for these costs, which means that the administrative costs have been underestimated, although this is unlikely to represent a large amount, especially when compared to the size of household investments.

Note 2: The TSC funds are the budgeted funds. Disbursement delays may occur.

household sanitation (to finance hardware subsidies for BPL households) but excluded TSC funds spent on institutional sanitation or for the provision of communal facilities.⁴ With respect to the TSC's software and program management costs (i.e. just under US\$54 million), we assumed that 90% of those costs were used to promote household sanitation, the remaining 10% being spent on institutional sanitation.

NGP awards are paid directly from the central government to the qualifying GPs, following a detailed assessment process. They account for just under 5% of the costs of household sanitation. NGP rewards can be anywhere between Rs 50,000 (US\$1250) to Rs 500,000 (US\$12,500) per GPs, depending on the population of the GP, from less than 1,000 population to 10,000 and above. The cash incentive is to be utilized for improving and maintaining sanitation facilities in their respective areas with a focus on solid and liquid waste disposal and maintenance of the sanitation standards.

GPs are eligible by achieving the following:

- 100% sanitation coverage of individual households;
- 100% school sanitation coverage (separate facilities for boys and girls recommended);
- Totally free from open defecation; and
- Maintenance of clean environment (including management of solid and liquid wastes).

For the purpose of estimating the costs of financing household sanitation, we have taken into account the total amounts of NGP awards paid to the districts, since it was not deemed possible to apportion those awards to household sanitation in particular. This is bound to be an overestimate, but it also reflects the stimulating impact that those funds had on triggering behavior change at the village panchayat level.

The State of Maharashtra has created additional campaigns and prizes in order to stimulate competition between local governments to achieve clean village status (see Box C.1 below).

Households fund about 90% of the total costs of adopting sanitation.

BOX C.1 - CLEAN VILLAGE COMPETITIONS AND CAMPAIGNS IN THE STATE OF MAHARASHTRA

The Sant Gadge Baba Gram Swachayata Abhiyan (SGBGSA), or Clean Village campaign, was initiated in 2001. It was originally meant to be a one-off event but later became a yearly one. This campaign exhorts villages to participate and cooperate spontaneously in the programs for rural sanitation program, with a view to ensuring sanitation in households and at the village level. Operationally, this focused on a set of campaign activities in a common calendar across the state, such as communities participating in one-off cleaning events and then continuing to maintain clean villages.

This was backed up with rewards from the state government through a Clean Village Competition, the Rashtrasant Tukdojee Maharaj Competition. The prizes are annually awarded to the best three GPs at the block, district, division and state levels. This competition compares the GPs across a set of development parameters – both social and infrastructural – that are weighted according to the priorities of the state administration. The sanitation component received a high priority and in later years became a precondition.

The Hagandhari Mukta Abhiyan campaign, initiated in 2002, focused on freeing the GP from open defecation. The response to this campaign made the state administration suggest that the open-defecation-free condition be made a pre-condition for consideration in the Clean Village Competition. After the initiation of the NGP by the national government, the SGBGSA guidelines for applicants also made ODF an implicit precondition.

Households are by far the main source of sanitation investment at the household level. They try to economize on the cash outlay through various strategies, as shown in Table C.4. These strategies include, for example, joint procurement of building materials, which may reduce household costs by up to 10%. Other strategies would include procurement on credit

⁴ Communal facilities do serve households, but the comparative focus of this study is on the cost of sanitation facilities at the household level rather than shared facilities, hence their exclusion from the analysis.

TABLE C.4. COMMUNITY AND HOUSEHOLD STRATEGIES TO ACHIEVE ODF STATUS

Community Strategies	Household strategies	Remarks
To minimize costs		
Arrange for local building material vendor to supply at fixed rates	Procure materials in groups to economize transport costs	These can bring down cash outflow for households between 5-15% of unit cost
Arrange bulk procurement and transport of select material (pan, trap, cement)	Provide household labor for construction	
To ease cash-flow stress on households		
Negotiate with building material vendor for credit period	Use house/land as collateral for credit from bank	Credit from informal and personal sources are generally for a year, vendor is similar.
Bring to the notice of SHGs the need for financing sanitation	Approach SHG for soft loans	
Arrange with banks/societies for credit to households	Borrow from friends/relatives	Superstructure choices are reported to potentially lessen costs by 20%
Stand guarantor for household credit recovery	Build temporary superstructure and upgrade later or use recycled material	
To support sanitation provision in the poorest/most disadvantaged households		
Procure materials with GP monies or contributions) for poorest households.	Provide household labor, where possible.	This is generally for the poorest households and those with only elderly or sick/handicapped members
Organize community voluntary labor for constructing toilets in poorest households	Use salvaged material for superstructure	
Advance loan/grant to selected households who cannot access formal/informal sources		
Plan for shared latrines (2 households for 1 unit) on GP land		

from a designated building-materials vendor, which is helpful for households that are struggling to put the necessary cash together. In many places, household voluntary labor has been supplemented by community labor to keep costs down and also to make work progress at a planned pace. There are no rewards or remuneration for these volunteers, who are motivated by the will to support village improvement and win a national award.

Since the financial support for latrine construction is provided by the TSC to BPL households after construction, the GPs have worked out support strategies for those households who cannot come up with the necessary funds up front, including procurement of materials on credit and financial support to indigent households from GP funds.

In some districts, the formal banking system has started responding to the sanitation financing needs with locally developed credit products. Most of these products are designed at a discount on the Prime Lending Rate (PLR) fixed by the central bank and have a tenor of four to five years.

Two main types of microlending products have been developed:

- Tailored sanitation credit products, which can be offered directly to individual households, with the GP and sometimes a self-help group (SHG) providing a guarantee; and
- A general revolving-fund line of credit that can be disbursed to an SHG, where the SHG can then on-lend to its members for specific end-uses. In the study districts, it was noticed that some of these lines of credit have been used for sanitation.

While the individual sanitation credit products from the formal banking channels were provided in Kolhapur district after discussions initiated by the district administration, this type of credit product has been provided only in minuscule numbers in the other study districts, indicating that it is not a pattern across the state. The SHG onward-lending channel has been reportedly more demand-based and in some cases has been offered where GP leaders have signaled SHG leaders.

The lack of a central repository of data on these credit products means that it is not possible to assess the extent of their use. Mehta (2008) analyzed available evidence from NGP verification reports for Maharashtra to suggest that about “60 percent of households who built new toilets took loans with an average loan size of US\$30.” She also identified SHGs and the district-level cooperative banks as the primary sources of credit. WaterAid India, in its annual review of projects, indicated that 52% of rural households in their project areas access financial support for sanitation construction and these households use a mix of finance sources – their own money, borrowings from other households, and loans from SHGs or Banks – to satisfy sanitation needs. However, no comprehensive review of the use of microfinance products for sanitation in the context of the TSC campaign has been carried out, which means that it is difficult to assess its impact.

The impact of these credit products seems positive when combined with a vigilant local leadership that leverages the cash flows towards achievement of ODF outcomes. It also makes the household more vigilant and proactive owing to peer pressure from SHG members and GP members. Discussions with district TSC officers and GP leaders indicated that such financing products have eased the mobilization process in the community by lifting the constraint of cash availability.

C.3.6 Subsidy design

Under the TSC, a maximum cash subsidy of Rs 1200 (US\$24 at current exchange rates) per toilet is provided to BPL households. This is a maximum amount of subsidy provided by the state and the central government in combination, irrespective of the technical choices made by the household. The TSC guidelines allow the state government to provide additional subsidies, but it would need to do so from its own funds.

The TSC guidelines refer to this payment as an incentive rather than a subsidy, given that the cash is transferred to the BPL households only once the village as a whole has reached ODF status. According to the 2007 TSC guidelines, the construction of household toilets should be undertaken by the BPL household itself. The “cash incentive” should be provided to the BPL household once completion of construction and use of the toilet by the BPL household can be demonstrated, “in recognition of its achievement.” However, the program

manager has some discretion over the subsidy award, depending on what is considered necessary to achieve full involvement of the community. In addition, the fact that a village needs to be eligible for the NGP award before any poor household can receive the subsidy strengthens the emphasis placed on community mobilization.

The amount of support has been decided based on the estimated costs of constructing the latrine without its superstructure, with unskilled labor being provided by the household. At the start of the TSC in 2000, the TSC subsidy or incentive was fixed at Rs 500 (US\$10). This was revised in 2006 to account for inflation and cost escalation. The incentive amount was then set at Rs 1,200 (US\$24). There are demands to review this level of support for problem areas (like hard rock terrain or water-logged areas) where the construction effort is more labor- and material-intensive and necessitates a larger financial outlay.

According to the TSC manual, BPL households are supposed to contribute about 20% of investment costs, as they would get a hardware subsidy paid in part by the Government of India (60% of the latrine cost) and in part by the state government (20% of latrine cost). However, given that the subsidy was capped at Rs 1,200, such a high subsidy level would correspond to an investment cost of Rs 1,500. In practice, however, BPL households have invested much more in sanitation, with the average cost of their investment being Rs 5,500. This means that the hardware subsidy provided only accounted for about 22% of household investment costs.

BPL households are identified through surveys carried out every five years. Monitoring is done indirectly through national sample surveys carried out annually, although that would only determine the number of people moving above or below the poverty line, rather than change the qualification of particular households. The last survey was in 2003. The categorization of the 2003 BPL survey is not used by most states, however, as the new criteria are not fully accepted. In most states, including Maharashtra, any programs that are targeted at BPL households make use of the 1997 survey data.

There are substantial exclusion errors associated with this poverty categorization mechanism. In some cases, in the drier and poor areas, poorer households migrate out for

work and hence fail to get captured in the survey. Village discussions indicated that exclusion error could be anywhere between 10% and 20%. Inclusion errors are reported to be less, at about 5% to 10%. Other studies point to higher levels of exclusion, such as 53% for Maharashtra and 50% nationally. A recent national survey analysis put the exclusion error at 31%, but this has not yet been validated.

C.4 Evaluation of the program's performance

This evaluation was done based on a more detailed analysis and field visits carried out in the three study districts of Chandrapur, Kolhapur, and Nashik, since some of the information was not available in an aggregated form at the state level. Getting district-level information enabled us to evaluate slightly different approaches depending on the district.

C.4.1 Impact on sustainable access to services

The TSC has generated a very substantial increase in coverage throughout the state, with more than 4 million latrines constructed in four years up to November 2008.

Although the TSC program was initiated in July 2000, it started operating at the district level in 2004 or 2005, depending on the district. The program expanded at a very fast pace in those initial years, although progress slowed down slightly in 2007-2008 as it sought to consolidate achievements.

Out of the total number of latrines built under the TSC, approximately 34% were built for BPL households with a hardware subsidy from the government. All other latrines were built without a public subsidy but thanks to a comprehensive program of social mobilization. In addition, it is important to note that a total of 117,693 latrines were provided to institutions during the same period, mostly to schools and angawadis. Table C.5 below shows key achievements of the program. **6,131 GPs achieved ODF status and obtained NGP rewards since TSC's start.**

The proportion of GPs having reached ODF status was 22% in Maharashtra as a whole by late 2008 and as high as 77% in Kolhapur. Whereas the state as a whole has still a long way to go before achieving ODF status, the districts where the TSC has been active for the last three or four years have made remarkable progress.

BOX C.2 - CRITERIA FOR IDENTIFYING BPL HOUSEHOLDS

The criteria for defining BPL households used in the 1997 survey had a set of five questions:

- Whether the household operated a land of more than two hectares;
- Whether it owned a 'pucca house' (i.e. made of durable material) as defined in the Population Census;
- Whether its annual income was more than Rs 20,000 (US\$400);
- Whether it owned any of the following consumer durables: television, refrigerator, ceiling fan, motor cycle/scooter and three wheelers; and
- Whether it owned farm equipment such as tractor, power-tiller, or combined thresher/harvesters.

These questions were asked of each and every household in the village. If a household answered in the affirmative to any one of the five questions, it was declared to be visibly nonpoor. This was done to distinguish the "visibly poor" from the "visibly nonpoor" households in the village relatively quickly and in an inexpensive manner. Visibly nonpoor households were excluded from the more extensive BPL survey that collected information on consumption expenditures.

Once households are identified as BPL, identity cards are issued to them that implicitly give them access to various anti-poverty programs (e.g., free or subsidized electricity, subsidized rations) which are implemented by the central and/or the state governments. The 1997 BPL census methodology has several shortcomings which are part of the debate nationally on development and poverty. Some of the major shortcomings are: (i) very stringent "exclusion" criterion whereby households are declared visibly nonpoor even if they possessed a ceiling fan; (ii) non-availability of official poverty lines for all states/UTs; (iii) using uniform criteria without allowing for inter-state variations, especially for hilly and remote areas; and (iv) not allowing new households to be declared poor in the interim period before the next survey is instituted.

TABLE C.5 – ACHIEVEMENTS OF THE TSC IN MAHARASHTRA AND STUDY DISTRICTS (JULY 2000 TO NOVEMBER 2008)

Study Districts	Chandrapur	Kolhapur	Nashik	Maharashtra
Number of households without sanitation at start of TSC (2003)	196,874	326,521	437,740	8,897,000
BPL Households w/o Sanitation	110,743	272,250	151,355	3,352,000
APL Households w/o Sanitation	86,131	54,271	286,385	5,545,000
Baseline coverage	23%	33%	17%	20%
Households provided with sanitation facilities through TSC	54,803	301,654	212,776	4,201,000
BPL households provided	37,960	62,421	104,677	1,442,000
APL households adopted	16,843	239,233	108,099	2,759,000
Increase in coverage (compared to 2003 population)*	21%	62%	41%	38%
Number GPs having obtained NGP reward (end Nov 08)	73	791	180	6,131

Note: The increase of coverage is calculated against the population in 2003 as data on the population in 2008 was not available. The increase in APL adoption in Kolhapur may reflect improvement of existing latrines.

Households reported satisfaction with the facilities accessed as a result of the TSC.

Women members were more vocal and emphatic in stating the advantages of having toilets in the house and took pride in their use and maintenance. Some reports of the older men resorting to open defecation were heard in the villages that are yet to achieve ODF status, but this was also reported as seasonal and temporary in nature. Village committee members were confident of getting the “elders to adopt acceptable practice,” once the campaign for keeping Panchayat ODF starts. The village visits indicated that the facilities were being used and where superstructures had previously been temporary in nature they had been built more permanently.

C.4.2 Costs

There is a wide variance in unit costs for household sanitation adoption depending on the district and on the level of household income, as shown on Table C.6 see page 91.

Total costs per APL household ranged from US\$156 in Nashik to US\$387 in Kolhapur, and total costs per BPL household ranged from US\$94.2 in Nashik to US\$117.4 in Kolhapur

The average cost of sanitation provision for an APL household was highest in the Kolhapur district. There are several potential reasons for this: Kolhapur is, on the whole, a richer district, so this would tend to push all materials costs higher. In addition, design preferences there were higher, helped by the availability of credit. Hardware costs represented the largest share of investments, with software costs accounting for only 7% of total costs in Maharashtra as a whole. In Nashik, the TSC program achieved significant results with a very small software cost mark-up (2% of total costs compared to 10% in Chandrapur).

From the household point of view, APL households had to contribute between 11% and 26% of their income and BPL households between 19% and 25% (after receiving financial support for hardware and adapting latrine construction designs and material use), as detailed in Table C.7 see page 91.

In Kolhapur, household investments represented the highest percentage of their incomes. It is likely that, given the wider availability of credit in that particular district, households have been able to commit higher investments than they would have done without access to credit. The fact that investments represent a high share of BPL households’ income in Kolhapur may also explain why, proportionally, BPL households did not benefit as much from the program, as discussed above.

TABLE C.6. TOTAL (PUBLIC AND PRIVATE) COSTS BY DISTRICT AND INCOME CATEGORY (US\$2008)

	Chandrapur		Kolhapur		Nashik		Maharashtra	
	US\$	%	US\$	%	US\$	%	US\$	%
All households								
Total costs per household	162.3	100%	317.3	100%	127.0	100%	223.9	100%
Hardware costs per household	150.6	93%	307.6	97.0%	123.0	97%	208.4	93%
Software costs per household	11.7	7%	9.6	3.0%	4.0	3%	15.5	7%
APL households								
Total costs per household	274.89	100%	387.89	100%	156.82	100%	332.88	100%
Hardware costs per household	263.2	96%	359.8	93%	152.8	97%	265.7	80%
Software costs per household	11.7	4%	28.1	7%	4.0	3%	67.2	20%
BPL households								
Total costs per household	112.3	100%	117.4	100%	94.2	100%	104.1	100%
Hardware costs per household	100.6	90%	107.8	91.8%	92.3	98%	98.8	95%
Software costs per household	11.7	10%	9.6	8.2%	2.0	2%	5.3	5%

TABLE C.7. HOUSEHOLD INVESTMENT AS % OF HOUSEHOLD INCOME

	Chandrapur	Kolhapur	Nashik	Maharashtra
APL households	18.7	26.0	11.1	18.6
BPL households	19.0	25.3	20.5	21.6

Source: Author's analysis.

Operating costs represent a very modest part of household incomes and, as such, are not an affordability constraint

For BPL households, operating and maintenance costs represented at most 1.20% of their annual income, mostly spent on latrine cleaning materials. That share would increase slightly if one were to include the cost of cleaning the septic tank (about Rs 600-800 or US\$12-16 per event), but lack of reliable information on the frequency required for such operations stopped us from calculating total operating-cost estimates.

C.4.3 Effectiveness in the use of public funds

From the public point of view, the increased access / public funding ratio was high throughout the state, with 50 households served for every US\$1,000 of public funds used and more than double that value in Nashik.

This indicator shows that US\$1,000 of public funds could trigger investment in household sanitation for at least 50 households. In Nashik, this ratio reached 109 households as software costs were very small and the technical solutions adopted by households were comparatively cheaper.

The TSC has succeeded in leveraging household investment for sanitation facilities, with leverage ratios varying from 2 to 38 depending on household income and on the district.

Leverage ratios are defined as the ratio between the funds invested privately and the public funds spent, including hardware subsidies and a portion of the total software costs (including campaigns and awards). On the whole, leverage ratios (as shown in Table C.8 bsee page 92) are lower for BPL households than for APL households, given that BPL households receive a hardware subsidy and invest in a lower (and cheaper) standard than APL households. The leverage ratio was highest in Nashik, where good results were achieved with relatively few software inputs. The leverage ratio was also substantially higher than average in Kolhapur, particularly for APL households, where the introduction of credit facilities seems to have helped in leveraging household investments.

Credit instruments can bring down the time required to move to total sanitation if other conditions of awareness creation and pride are in place.

TABLE C.8. LEVERAGE RATIOS: US\$ INVESTED PRIVATELY FOR EACH US\$ OF PUBLIC MONEY SPENT

	Chandrapur	Kolhapur	Nashik	Maharashtra
Overall (all households)	4.7	27.7	12.9	10.3
For APL households	22.5	37.3	38.0	17.1
For BPL households	2.1	6.1	11.0	3.1

Among the study districts, Kolhapur was the only district where there had been an organized initiative to link households with credit institutions (it is also a comparatively richer district where households are likely to be better educated). This seems to have accelerated the move towards total sanitation. In 2008, after such credit products were introduced, 603 GPs were declared NGP, compared to a cumulative total of 258 GPs achieved over the previous three years. In the other districts, credit instruments were only offered on a sporadic basis, arising from local bank manager initiatives and not as a district-wide attempt. Where used, credit instruments seem to have been useful to lift any financial stumbling blocks to move the household from intention to construction.

C.4.3 Poverty targeting

In terms of poverty targeting, the program has focused on behavior change in poor and nonpoor households, with additional financial support for poor households that adopted household sanitation practices. The program is targeted at poor households (those households that have an average annual household income of less than US\$400 and meet a series of other criteria, as described in Box C.2 above). The hardware subsidy provided to BPL households represented approximately 20% to 25% of hardware costs for those households, whereas APL households received no hardware subsidies.

Errors of exclusion follow from the BPL survey categorization.

Discussions at the village indicate an exclusion error estimate between 10% and 20% and a possible inclusion error of a similar proportion. Inclusion errors are not corrected, but the GPs attempt to correct the exclusion errors by providing some kind of short-term support from the GP funds, where possible. The bottom range of the APL households, which might have been wrongly categorized as such, is disadvantaged by the fact that they would seldom have access to credit since they are not deemed creditworthy.

The funds allocated to hardware subsidies for BPL households accounted for 22% of total public spending in Maharashtra, although this share stood at close to 60% in Chandrapur and Nashik compared to only 13% in Kolhapur. This is because the programs have targeted BPL households much more aggressively in Chandrapur and Nashik. In Kolhapur, even though 83% of the households without sanitation at the start of the program were BPL households, almost 80% of latrines built under the TSC were for APL households. By contrast, in Chandrapur BPL households accounted for 56% of households without sanitation at the start of the program, but they represented 69% of beneficiaries during the life of the program.

C.4.4 Financial sustainability

The program appears financially sustainable given that public financing represents a relatively modest share of total investment.

Public financing (non-repayable) represented 9% of total expenditure in Maharashtra as a whole, but ranged from 3% in Kolhapur to 18% in Chandrapur, pointing to relatively high financial sustainability. This ratio remains relatively modest, which means that the financial sustainability of the scheme is not in question, especially given that funds to scale up this initiative have already been allocated. However, there are reasons to be concerned about the physical sustainability of the scheme.

The formal monitoring and assessment system for the NGP awards is largely a one-off event, however, which means that lasting improvements may not always be achieved.

A national study commissioned by UNICEF reported that 35% of households resorted to open defecation in panchayats declared NGP the year before.⁵ Among the study panchayats (162 GPs), only 4% seem to have maintained ODF status (most

5 See UNICEF 2008.

of these from Maharashtra) and another 27% of panchayats had less than 10% of the households practicing open defecation whereas the other villages had a higher proportion of people doing so. Thus, the sustainability of the ODF achievement poses questions and points to the need for monitoring and corrections in the post-ODF achievement phase.

In Maharashtra, the SGBGSA and the RTM CVC serve to maintain this performance for interested GPs to an extent, as these campaigns are run annually and 30% of the score for the RTM CVC is based on household sanitation (in addition to other indicators), so the number of villages returning to open defecation practices is lower than in other states.

The financing mechanisms developed by Banks for supporting sanitation investments have been tried out for the first time in Kolhapur and in some parts of the other districts. The sustainability of this as a financial operation will only be fully understood over the next two to three years.

Considering the 95% recovery rate reported by the SHGs, it should not be a problem for banks to recover and sustain these operations, as long as relationships with the customers are maintained.

The key element of financial sustainability at the local level would arise from successful completion of the sanitation initiative and not allowing the credit product to be misused or badly used. This requires dovetailing the credit provision with the IEC effort and management of the supply chain.

C.4.5 Scalability

The TSC has already scaled to 587 of the 608 rural districts in the country, with enough funds being made available by the national government to achieve the objectives identified in these districts and take up and complete the remaining rural districts.

The program has already been extended to all the districts in the state of Maharashtra and has recorded modest to substantial progress. In terms of government investments, the quantum of funds earmarked for this form only a minuscule part of the state and national budgets. For example, the national budget (2008-2009) had total expenditures of Rs 7,508,830 million, out of which the budget for TSC accounted for 0.2%.

C.5 Summary evaluation

This study examined the situation of sanitation financing practice and the articulation of policies and program guidelines through small field studies in three selected districts of Maharashtra. Overall, the TSC campaign (and accompanying measures) had a very substantial impact over a short period, and this impact has high chances of being sustained over time thanks to incentives linked to outcomes.

In terms of impact on sustainable access to services, the TSC campaign in Maharashtra generated rapid gains in coverage, with 21 million people getting access to sanitation in four years throughout the state, equivalent to an 18% gain in coverage across the state.

In cost terms, the program delivered solutions at a reasonable cost. The burden on public funds was limited, with a high increased access / public funding ratio, with US\$1,000 in public investments enabling between 50 and 100 households to get access to sanitation. For APL households, the investment represented a sizeable portion of their annual income (between 11% and 26%), equivalent to the burden for BPL households following reception of the financial incentive. Operating costs were very affordable but the costs of emptying septic tanks on a regular basis may have not been fully taken into account.

In terms of effectiveness in the use of public funds, the leverage ratio is very high, with US\$1 of public funds generating slightly over US\$10 of private investments. Among the study districts, the leverage ratio was very high (37) in Kolhapur for APL households, in part thanks to a district-wide initiative to offer microcredit for sanitation investments.

In terms of poverty targeting, the TSC program provided targeted support for BPL households identified based on a narrow set of criteria. The hardware subsidies accounted for 22% of total public fund spending, which is relatively modest. There were problems in the identification of poor households, however, with exclusion errors (i.e., poor people not being eligible for the subsidy) being estimated at 10% to 20% and in some cases up to 53%. Inclusion errors are reported to be much less.

The TSC is financially sustainable, as it was mostly households that invested in their own facilities, with public funds accounting for only 9% of total costs. There are questions about the physical sustainability of the scheme, however, since the NGP award is largely a one-off event. However, the set of campaigns developed by the State of Maharashtra helps maintain ODF performance over time, especially with the yearly Sant Gadge Baba (SGBGSA) campaign which puts emphasis on village cleanliness.

The TSC approach has already been scaled up to 587 districts out of the 608 rural districts in the country, with enough funds made available by the national government to reach the objectives in those districts. The funds allocated to the TSC represent a minuscule portion of the national budget (0.2%). However, the scale of the challenge remains substantial, with 59% of the Indian rural population still lacking access to improved sanitation.

WHAT SEEMS TO HAVE WORKED?

The TSC program relied mostly on communication and motivation for behavior change leading to household sanitation investment and improved sanitation practices. Where necessary, it has provided targeted support for poor households in order to ensure that the village as a whole could reach ODF status and other cleanliness objectives.

Monetary rewards provided to villages that have met a number of criteria (including 100% household latrine and ODF status) seem to have been effective at triggering village-wide mobilization. The rewards need to be spent on sanitation investments, which strengthen the ability of the program to sustain results over time. In addition, Maharashtra has adopted other statewide campaigns, which in some cases include an annual monitoring process. This, together with a focus on outcomes rather than outputs, should help with maintaining usage over time. Such emphasis on outcomes was introduced in 2004 to improve effectiveness.

Hardware subsidies are provided to a narrowly defined group of poor households. These subsidies are provided ex-post, once the household has built the latrine and the village as a whole has been declared ODF. The switch to an output-based subsidy meant more than a difference in payment terms. It meant that the entire program was more focused on promoting demand at the village level rather than on building latrines for BPL households.

Since the financial support for latrine construction to poor households is provided only after construction, many such households have difficulty mobilizing the funds required to invest. Some local governments have defined strategies to help poor households build latrines before they get the subsidy, such as procurement of materials on credit and financial support to indigent households from GP funds. The study found that even poor households receiving a subsidy spent far more than the subsidy on building a latrine that met their needs; whereas external hardware subsidies were originally intended to cover 80% of the latrine costs, in practice they often covered only 20% to 25%.

Credit has developed in a number of ways to help households meet the investment costs. One option has been to make use of credit facilities provided by the formal banking channels to informal savings groups (SHGs), while the other (as in Kolhapur) has been to coordinate with the lead bank and the panchayats to design a credit product for latrine construction. However, this more “formal” type of credit scheme has mostly benefited the APL households in the district of Kolhapur, which is also comparatively richer. Where available, credit has helped speed up household adoption, although it was not a key determinant for getting the households to adopt sanitation.

AND WHAT DID NOT WORK SO WELL?

Exclusion errors linked to poverty categorization have created concerns regarding the equity of the scheme. The income categorization applied to the 2003 survey has been questioned and attacked in court, which means that most states still use data from a population survey dating back to 1997. Households will most certainly have moved in and out of poverty since then. This is mitigated to an extent at the local level through GP initiatives to provide support to excluded households.

The provision of credit has been one way of alleviating the burden for poor households (particularly for those that have been denied subsidies because they have not been categorized as poor). However, such initiatives are only sporadic at present, with some districts being ahead of others, and they have not been well documented. In addition, the mixed history of rural credit in India would suggest that such products need to be designed to suit local construction and livelihoods and delivered coupled with suitable institutional safeguards. Care must also be taken to ensure that access to such products follows behavior change interventions and is supported by the supply chain elements.

Finally, despite the ongoing campaigns, *sustainability of ODF achievements remains a key challenge.* Program managers are discussing possible methods for post-ODF monitoring and dovetailing with the broader development agenda

Annex D - Mozambique case study

Case study written by Alan Malina and Sophie Trémolet

OVERVIEW OF MOZAMBIQUE CASE STUDY (PLM PROJECT)

Key facts	
Project name	PLM (Programa de Latrinas Melhoradas)
Project objectives	Establish production units of improved latrines in all major urban centers throughout the country and promote sales of improved latrines at a subsidized price.
Public financiers	Government of Mozambique, with initial support from donors (with UNDP as lead)
Scale	1,888,000 people reached in all 10 provincial capitals and some district towns
Time frame	Program years: Late 1980s to date / Study period: data up to 2007
Level of service	Improved latrines (domed slab with concrete blocks for lining the pit)
Summary of financing approach	
Software support	<ul style="list-style-type: none"> • Software support for sanitation promotion and the establishment of local workshops building slabs and latrines • Software mark-up initially accounted for a substantial amount but reduced to nothing following the decentralization process.
Hardware subsidies	<ul style="list-style-type: none"> • Output-based hardware subsidies to local sanitation providers for each slab or latrine sold (initially intended to cover 40% to 60% of hardware costs) • Public hardware subsidy: about US\$20 per household (19% of hardware costs). This can be complemented by a substantial cross-subsidy from other workshop activities (selling cement slabs, renting out space, etc.). • Hardware subsidies = 100% of public funds (following decentralization as data for the previous period is not available)
Access to credit	<ul style="list-style-type: none"> • Not specifically included
Summary evaluation	
Impact on sustainable access	<ul style="list-style-type: none"> • Almost all with improved latrine got it through PLM (29% of urban population) • Relatively high level of maintenance and good evidence that slabs have been moved to a new pit when the initial one fills up
Costs	<ul style="list-style-type: none"> • Average hardware costs: US\$70 (about 10% of lowest quintile income) • Moderate to low operating costs (exact figure not estimated)
Effectiveness in the use of public funds	<ul style="list-style-type: none"> • Relatively low leverage ratio: 0.87 (partly due to relatively low cost of latrine) • “Increased access / public funding” ratio not available
Poverty targeting	<ul style="list-style-type: none"> • No explicit poverty targeting: all potential customers assumed to be poor • Implicit targeting via self-selection given relatively low level of service
Financial sustainability	<ul style="list-style-type: none"> • Public funds = 58% of total costs of sanitation adoption (estimated): low sustainability and high dependency on external financing
Scalability	<ul style="list-style-type: none"> • Not scalable in its current state (sources of subsidy financing have almost dried up)

OVERVIEW OF MOZAMBIQUE CASE STUDY (PLM PROJECT) CONTINUED

Some lessons learned

What worked?	<ul style="list-style-type: none"> Subsidies provided to the production workshops, based on sales figures, were an interesting attempt to bolster the supply chain. This was also more effective than providing subsidies to households, especially at times when the administrative system was weak during the civil war.
What did not work so well?	<ul style="list-style-type: none"> The production subsidies have not been updated to reflect price increases As a result, workshops are cash-strapped and cannot invest in adapting what they have on offer to current market demand.

D.1 Overview of the financing approach

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 program 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 “workshops” by the program and they are neither purely public nor private. The approach to the program has evolved substantially over the years. Over the last 17 years, the program 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 program (the improved latrine) was around US\$70.

The program initially helped to set 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 program 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.

This case study starts by providing some brief background on the country and sanitation context. We present the way in which on-site sanitation was provided through the program before analyzing the costs of such provision. We then evaluate the performance of the financing approach for the on-site solution, focusing on its impact on sustainable access to services, its costs and effectiveness in the use of public funds, and its poverty targeting, financial sustainability, and scalability. A summary section draws out key lessons learned from the program, looking at what seems to have worked and what did not work so well.

The detailed evaluation in this case study is focused on the current set-up of the program, since detailed quantitative information on the previous phases was not available.

D.2 Country and sanitation sector context

D.2.1 Country context

Mozambique is one of the world’s least developed nations, with over 50% of the total population of about 20 million living in severe poverty. Its situation has worsened over the last three decades largely due to the civil war, which lasted from independence in 1975 until 1992. The war destroyed much of the social and economic infrastructure of the country. Thousands of people died, 1.5 million became refugees, and 3.5 million were displaced internally, mainly to insani-tary and poverty-stricken peri-urban areas. Drought and economic factors have also contributed to Mozambique’s problems. Mozambique’s GDP per capita stood at US\$396 in 2007 and was US\$842 in PPP-adjusted terms, according to the IMF’s World Economic Outlook.

6 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 while 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.

D.2.2 Initiatives to increase coverage

In peri-urban areas, the major initiative to increase coverage was the National Low-Cost Sanitation Program (*Programa Nacional Saneamento Baixo Custo*, PNSBC), which has been in existence in different forms since its creation in 1985. This program, which was later renamed the Improved Latrines Program (*Programa de Latrinas Melhoradas*, PLM) is the subject of this case study and is reviewed in more detail in Section D.3.

D.2.3 Access to sanitation

Urban coverage. The coverage through sewer networks in Mozambique is very low and will continue to be low despite significant planned investment, benefiting the residents of the central fully urbanized areas of some cities. Only two wastewater treatment plants exist in the country, one in Maputo and one in the model town of Songo that serves the Cabora Bassa dam. In 2006, urban sanitation coverage (including peri-urban areas) was estimated as shown in Table D.1 below. The number of people served by an improved latrine corresponds roughly to the number of improved latrines built under the PLM throughout the various stages of the program, which means that the PLM made a key contribution to improving access to improved sanitation throughout the country.⁷

Coverage is substantially higher in the capital city, Maputo. A comprehensive household survey carried out by the Water and Sanitation for the Urban Poor (WSUP) project

in 2008 in some peri-urban areas of Maputo indicated 82% coverage by improved sanitation (38% of the population had septic tanks, 43% had improved latrines and 1% had ecosan latrines, while 16% had traditional latrines and only 2% no excreta disposal facility at all).

Adequate sanitation coverage is higher in the 23 larger cities (48% of a total of about 5.5 million people) than in the 68 small towns (14.4% of about one million people). These small towns were included in the urban context for water and sanitation in 2006 only.

Rural coverage. Rural coverage lags considerably behind urban coverage, even if towns are included in the definition of rural (see Table D.2 below). Depending on whether unimproved or traditional latrines (without a concrete slab) are included in the coverage numbers, the actual coverage (with an improved traditional latrine) can vary from 2% to 36%.

TABLE D.2 RURAL SANITATION COVERAGE IN MOZAMBIQUE

Year	Total rural coverage	Unimproved Latrine	Improved Latrine	Septic Tanks
2000	28.7%	27%	1.4%	0.3%
2002	33.3%	31.2%	1.8%	0.3%

Source: National Statistics Institute (INE). Note: Statistics include coverage in the 68 towns, still defined as rural at the time.

D.2.4 Institutional set-up for sanitation

TABLE D.1. URBAN SANITATION COVERAGE, 2006

		Coverage (%)	Population
Served by adequate sanitation		44%	2,860,000
of which	Public sewer network	4%	260,000
	Septic tank	11%	715,000
	Improved latrine	29%	1,885,000
No adequate sanitation		56%	3,640,000
of which	Traditional latrine	about 40%	~2,600,000
	Other or none	about 16%	~1,040,000
Total		100%	6,500,000

Sources: National Directorate of Water; sewerage data from individual towns

⁷ The private construction sector provides other types of sanitation solutions, including cesspits and pour-flush toilets, which are targeted at the better-off segment of the population.

Overall set-up. The Ministry of Public Works and Housing (MOPH) is the highest government entity with authority over public works and water resources management that directs and controls activities in the water and sanitation sector. The National Directorate of Water (DNA) is the entity within MOPH responsible for water supply, sanitation and water resources management. DNA is composed of three departments and three offices, with the Sanitation Department (DES) being responsible for the promotion and coordination of both urban and rural sanitation activities. The sectoral functions of MOPH are executed at the provincial government level by Provincial Directorates of Public Works and Housing (DPOPH). The decentralization process assigns increased responsibilities to the district governments and municipal councils.

Urban sanitation. Wastewater and rainwater networks and wastewater treatment infrastructures are generally managed directly by the municipalities. Given that each municipality defines its own internal structure, this service can be managed by a directorate, a department, an office, a councilor, a service or a sector. Only in Maputo, Quelimane, and Beira are the services administered in a more autonomous way. With respect to on-site sanitation, the promotion and construction of improved latrines is the responsibility of the Improved Latrines Program (PLM), the subject of this case study (see Section D.3 for an overview of the program).

Rural sanitation. With decentralization, responsibility for rural sanitation falls to the municipal councils (which often have significant rural areas under the responsibility) and district administrations. Their responsibility is not to build but to give direction, coordination and supervision to NGOs, CBOs and the private sector, so that each family can have its own sanitation facilities. The Provincial Water and Sanitation Department (DAS) under the DPOPH has a key role in supporting the municipal councils and the district administrators through training and technical assistance as well as assisting in identifying financing (supported by DNA at the national level).

D.3 The Improved Latrines Program (PLM)

This section presents the overall set-up of the PLM, the institutional set-up and levels of service, the total costs and sources of financing, as well as the methodology for subsidy design.

D.3.1 Program overview

The PLM has evolved substantially from its inception in the late 1970s to date. We can distinguish several phases, as follows:

- **Initial pilot phase:** From 1979 to 1981, the low-cost latrine technology was developed and tested, mostly in Maputo;
- **Scale-up phase:** From 1982 to 1992, the government extended the approach, creating slab production workshops, first in Maputo and then in other cities, without hardware subsidies but with software support;
- **Development phase:** From 1992 to the late 1990s, the government refined the approach to increase performance, with the introduction of output-based subsidies paid directly to the workshops (based on sales) and the inclusion of community animators in charge of demand promotion and community mobilization; and
- **Decline phase:** From the late 1990s to date, the program has been gradually losing momentum, due to the withdrawal of most external donor support, a badly managed decentralization process, a subsidy freeze (they have not increased in line with costs or have been eliminated by provincial governments), the loss of community animators, and a slump in demand for the workshops' products. The future of the program as it currently stands is seriously at stake, unless it is revitalized.

Initial pilot phase (late 1970s to 1985). The program started when the government, with external support, instituted a research project in 1979 to design a latrine that was technically sound, could be used widely in the country and was affordable to most peri-urban households. The research revealed that most households could dig a pit, typically 1.1 meters in diameter, and most were satisfied with an unroofed fence for privacy, but that the biggest problem was covering the pit. The research project designed a domed latrine slab, and piloted it successfully in one peri-urban area of Maputo. In 1982 the Maputo City Council adopted the research project's approach and began replicating it in other parts of the city by establishing a series of cooperatives.

Scale-up phase (1985 to 1992). The program was expanded to the national level in the mid 1980s with central government and donor support, and in 1985 was transformed into PNSBC with the objective of serving expansion zones on the outskirts of cities. At that time, there was an acute shortage of qualified professionals in Mozambique. They were concentrated in Maputo, so PNSBC's main management and decision-making office was located there. However, Mozambique is a very large country with poor transport infrastructure, so it was necessary to establish production units in cities and towns across the country.

The program led to the creation of PLM workshops in 16 major cities. The initial idea was to establish cooperatives in each neighborhood, where three to five people would make slabs and blocks, carry out promotion and offer installation services for improved latrines. However, the cooperatives did not take off and the workshops were established as semi-public entities, with funding from the central government via the project. By 1987, PNSBC had established 38 production units around the country and was active in all 10 provincial capitals and some large district towns. This helped to bring the program closer to its target beneficiaries. Production rose to 25,000 slabs per year and a rural program was also established, although the focus remained predominantly on peri-urban areas. However, workshops were equipped with donated tractors and trucks and other equipment which was not viable from an economic point of view.

Development phase (1992 to the late 1990s). In 1992, following a sharp increase in the costs of construction materials, production subsidies were introduced and paid to the workshops for each unit produced and sold. By 1994, an increasing effort was made to introduce a promotional element, including health and hygiene, using community animators. Although there were never more than 80 community animators for the whole country, it made a significant impact on the demand for improved latrines. The community animators were assigned to specific PLM Workshops and assisted in publicizing the services offered and increasing demand. This helped in coordinating latrine construction with hygiene promotion and the assessment of eligibility for free latrines.

Decline phase (from the late 1990s to date). In the late 1990s, the external support agencies became increasingly concerned about the sustainability of the program. Demand for the workshops' products had slumped, as the demand in their immediate surroundings had already been fulfilled and the population was getting richer, with higher expectations in terms of level of service. The United Nations Development Programme (UNDP), the main support agency, began planning its withdrawal from PNSBC. Donors facilitated the development of a Low-Cost Rural and Peri-Urban Sanitation Strategy, 1999-2003, with the objectives of decentralizing operations, changing the role of the government from implementation to that of creating an enabling environment and involving the private sector and NGOs in implementation. This Strategy foresaw the gradual transfer of responsibilities to the municipal councils and/or DPOPH with a program of capacity building over three years.

A rapid and poorly prepared decentralization process was initiated in 2002. Despite the development of the strategy, little or no progress was made in decentralizing the PNSBC, and eventually the external donors withdrew their funding because they saw the centralized program as unsustainable. The PLM workshops became "autonomous" units under the direction of the Provincial Water and Sanitation Departments (DAS) with unclear legal status, being halfway public and halfway private bodies. Although the workshops are technically under the supervision of the Provincial DAS, the DAS have no budgetary obligation towards the PLM workshops. The workshop workers are not civil servants and in most cases they do not have a contract (although in Maputo and a few other cases, the DAS does in fact locate civil servants in the workshops). The workshop workers are paid through the proceeds of latrine sales but the transfer of government subsidies varies in each province. The community animators were assigned to municipal councils, while some went to work for NGOs as trained community development agents. As a result, the PLM workshops effectively lost their "sales people". However, in two or three cases, the municipal councils did take a more proactive role in adopting the PLM, and these workshops are still functioning well to date

The PLM is currently going through a serious crisis, and the long-term viability of the PLM workshops is at risk. At present, very few of the PLMs are financially sustainable. They are receiving no training or support from the national level. The approach to the PLM varies from one Province to another. Given that the PLM Workshops have very few remaining social animators, little is carried out regarding hygiene and health education and demand generation. Some technicians from the workshops try to stay in contact with the communities with lectures in schools and house visits, but this is very much dependent on the training and character of each individual.

D.3.2 Program institutional set-up

The PNSBC was initially hosted by the National Institute for Physical Planning, which was later absorbed by the Institute for Rural Development. Following institutional reform, the PNSBC was relocated in 2001 to a low-cost sanitation office within the DNA.

Following decentralization, there is no longer a central PLM office giving guidance and advice to the PLM Workshops. The Department of Sanitation (DES), under DNA, is directly responsible for three PLM workshops in Maputo City, but it only has indicative responsibility for the decentralized PLM workshops in the provinces. With little direction from the national level, each province decides independently what to do with its PLM. The pool of qualified people trained through the PLM is gradually being lost.

This lack of centralized control has had a detrimental impact on program monitoring and evaluation. DES tries to obtain figures of annual production of improved latrines from the Provinces, both by the PLM and others. However, DES admits that it is difficult to obtain “real” numbers for latrine construction, as many different actors are now involved from the PLM workshops through the municipal Councils, NGOs, and the private sector as well as the individual families themselves.

D.3.3 Levels of service

Three basic technologies are proposed through the PLM, as described below:

- The domed slab (with or without lining of the pits, depending on soil conditions);
- The sanplat; and
- The pour-flush latrine using a sanplat.

The *domed slab* (with or without lining of the pits, depending on soil conditions) was the technology initially developed by the PNSBC. It contains about half a bag of cement and no steel and there are a significant number of people trained to fabricate it.

The *sanplat* consists of a 0.6 x 0.6 meter square concrete slab (with lid) that can be placed on existing traditional latrines, making them easier to maintain as well as safer.

The *pour-flush latrine using a sanplat* has been proposed as an alternative model. This option can be used inside the house, linked to the pit through a PVC pipe. The pit can be closed off with a slab. Very few units with this option have been produced and sold, however.

The PLMs generally produce the domed slab with concrete blocks for lining the pits. The other technologies are proposed as models. Since the PLMs no longer have social animators, there is little demand for the other technologies, which are not well known to the population.

CAPITAL COSTS

In 2007, the production costs of a domed slab in the PLMs varied from 375 to 800 MTn (US\$ 10 to 30) and the costs of building a complete latrine varied from 1,462 to 2,350 MTn (US\$ 56 to 89) as shown in Table D.3 below. These costs include labor and overhead.

TABLE D.3 – CAPITAL COSTS OF LATRINE CONSTRUCTION IN PLM WORKSHOPS, 2007

Province	Production costs per unit (2007 US\$)	
	Slab	Latrine (including cost of slab)
Nampula	16.9	55.6
Zambézia urban	19.0	58.9
Zambézia rural	25.9	
Gaza	30.4	89.4
Maputo City	14.3	74.5
Average (straight)	21.3	69.6

Note: The data is expressed in 2007 US\$ based on the following exchange rate: 1US\$= 26.3 MTn

Production costs vary from one province to another largely

due to transport costs and the relative availability of building materials. Production costs are lower in the capital city of Maputo, where all materials are available and transport costs are minimized. Even though the workshops used to build entire latrines (for vulnerable populations that used to receive a 100% subsidy) they are now mostly producing and selling slabs, leaving latrine building to the households. The workshops would only build entire latrines when they got paid by donors for doing it.

OPERATION AND MAINTENANCE COSTS

Operating costs are considered to be low, largely because the latrines are not emptied and cleaning is carried out with locally available products (brooms, water, etc.). When the latrine pit is full, the slab is removed and placed over a new pit. Pits tend to fill approximately every 10 years, although this would depend on their depth and the number of people using them. Although there is evidence that some households have been moving the slabs to new pits, no data is collected on the number of slabs being moved or pit-emptying activities.

SOFTWARE COSTS

Software costs were incurred during the earlier phases of the program to pilot the approach, establish the PLM workshops, fund the community animators and provide overall program coordination at the national level. However, much of these earlier initiatives has unraveled since the late 1990s. The PLM workshops no longer carry out the “soft” activities (such as health and hygiene education and demand generation) which were previously provided by community animators. Since decentralization, administration and

management activities have also been kept to a minimum. Some workshops produce annual reports but these are basic and focus on the number of slabs produced and sold. Due to this lack of project administration, software costs are not accounted for at present and are likely to be very small.

D.3.4 Total program costs

Since the central management of the PNSBC was broken up following decentralization, solid numbers (of any kind, including financial) from the provincial level have been very difficult to collate. The DES attempts to compute annual provincial latrine production figures, although it would itself question the validity of such figures. Given these limitations, it is not possible to compute an estimate of the total costs of the program as they currently stand. Historical information on program costs prior to decentralization was not available either.

D.3.5 Sources of funds

Prior to decentralization. In 1992, the government started providing a subsidy for the cost of production so the slabs would be affordable to the poor in peri-urban areas. Workshops received the subsidy based on actual sales carried out so that the slabs could be sold at lower prices. The costs of building a complete latrine were also subsidized, but the workshop would only receive the subsidy after the latrine had been built.

The PNSBC was initially supported by several external agencies, principally the UNDP. The sanitation work was funded from three sources: external support agencies (mostly support for personnel, equipment, slab production costs and some recurrent costs); householders (purchase and transport of slabs,

TABLE D.4 CENTRAL GOVERNMENT SUBSIDIES FOR IMPROVED LATRINES (IN 2000 US\$)

City	Product	Production price	Subsidy	Charge to Household	% subsidy
Maputo/	Slab	10.7	4.5	6.2	42%
Matola	Latrine	44.9	22.2	22.7	49%
	Lining	36.9	20.7	16.2	56%
Xai-xai	Slab	8.8	4.3	4.5	48%
	Latrine	36.8	17.3	19.4	47%
	Lining	30.1	17.2	12.9	57%
Tete	Slab	11.6	6.4	5.2	55%
	Latrine	36.5	17.1	19.4	47%
	Lining	26.3	11.4	14.9	43%

Note: The data is expressed in 2000 US\$, based on the following exchange rate: 1US\$= 15,447 MZM. The total latrine cost includes the cost of the slab, as well as digging and lining costs.

construction work); and the national government (part funding of the subsidy for slabs, staff and other costs). In 2000, the relative contributions amounted to 57% from external support agencies, 10% from the government and 33% from households.

Subsidy amounts and percentage of costs varied from one province to the other, as shown in Table D.4 below. The last time subsidies were based on a fairly detailed analysis of production costs was in 2000. Different subsidy rates were defined in order to reflect varying levels of poverty in the provinces.

Following decentralization, responsibility for the program was transferred from the central to the provincial governments. The subsidy system was continued only in certain cases. The subsidy amounts have not been updated since 2000 levels (as shown in Table D.4 above), while production costs have substantially increased, partly due to substantial general inflation.

Moreover, a 2005 regulation regarding the disbursement of government funds (Regulation 54/2005) has been interpreted in different ways by provincial authorities. Some have interpreted this regulation to mean that DPOPH cannot fund or transfer subsidies to the PLM workshops as they do not have an official license to build (*alvará*). To obtain such a license, they would need, among other conditions, to have 150,000 MTn (US\$5,700) in a bank account, an impossible task for the workshops. Without such a license, some provincial authorities have decided to stop providing subsidies. In addition, outside of Maputo, little effort is made to inform the provincial directors of the procedures for obtaining the subsidies.

The PLM workshops were expected to take on other activities in order to survive, without actually specifying what and how. The workshops have to be self-supporting to pay for their staff. In general, slabs and latrines are being sold at a loss, even if taking account of the subsidies from the DPOPH in some cases. As a result, each PLM workshop had to develop its own strategy in order to survive, including the following elements:

- *Some PLM workshops have increased sales prices.* Even though the charges to the client were set in 2000 together with the subsidy levels, some workshops have increased their charges to bring those closer to

production costs. For example, the PLM workshop in Nampula sold a slab for 300 MTn (US\$11) in 2007 instead of the price set by the government in 2000 of 80,000 MZM (US\$5). Others, such as the PLM workshops in Maputo, which are still controlled by the DAS, have not been able to do so and are still charging the same nominal prices as in 2000 (i.e. not even adjusted for inflation).

- *Some PLM workshops have developed other income-generation activities to cross-subsidize the latrines*, including some for which they do not have permits (e.g., civil construction), some that are inappropriate (selling chickens or renting out office space), and others where they are competing directly with the unsubsidized private sector (e.g., concrete block production).
- *Some PLM workshops have sought other subsidy sources from donors and NGOs.* In Zambézia Province, for example, the workshop has entered into a contract with UNICEF to provide services for rural areas. Thanks to this contract, the PLM workshop was able to recruit new social animators. The PLM workshop trains local artisans in sanitation infrastructure construction techniques as well as health and hygiene education. They also create demonstration centers where the different technologies can be seen and the social animators spend time in communities. UNICEF subsidizes each latrine with half a bag of cement per family. The family pays the rest to the local artisan and provides most of the physical labor.

In several cases, however, these strategies have not been sufficient. Many PLM workshops have not paid staff salaries for several months and are on the verge of bankruptcy. In Nampula, for example, the workshop has 21 workers with a total salary base of 20,000 MTn (US\$760) per month and has had to delay paying salaries for several months. Some workshops (in Nampula) have closed down or have stopped production (for example, in Maputo city). Box D.1 on page 105 gives an example of the PLM workshops' financial situation.

BOX D.1 – FINANCIAL IMBALANCES AND CROSS-SUBSIDIES IN ONE MAPUTO CITY PLM WORKSHOP

In the Maputo City PLM workshop, the actual cost of production of each slab was about 375 MTn (about US\$14) in 2007, but the sales price is still 95 MTn (about US\$4) and has not changed since 2000 in local currency. PLM workshops in Maputo City are still under central government control, which may explain why sales prices have not changed. On the other hand, they are among the few workshops which still receive a subsidy for each unit sold.

A particular feature of the Maputo workshop is that it employs a high number of civil servants, since it maintains a connection with the Department of Sanitation in the central government.

To cover the shortfall between sales revenues and workshop costs, income is generated through the sale of concrete blocks and the rental of office space to the private sector within the workshop compound (the workshop was built on land donated by the municipality).

YEARLY P&L ACCOUNT FOR MAPUTO CITY PLM WORKSHOP (2007)

	US\$	Comments
Number of latrines / slabs produced	686	Estimated to be only slabs rather than latrines
Sale price / unit	4	
Sales revenues	2,478	
Production costs / unit	14	
Total estimated production costs	9,781	
Workshop salary costs (12 contract staff)	8,213	Based on 12 employees at 18,000 MTn/month
Other staff costs (10 civil servants)	0	Civil servants are paid by central government – estimated cost to the government: US\$6,844
Other costs	1,141	Based on 2500 MTn/month
Total workshop costs	9,354	Difference from production costs may reflect the fact that civil servants are not paid by workshop
Shortfall (sales / production)	-6,876	Based on actual production costs, without the costs of civil servants
Subsidies	1,826	Paid by central government @ 70 MTn/slab
Shortfall after subsidies	- 5,049	To be covered through other activities, such as office rental, and cement block construction

D.3.6 Subsidy design

At different stages of the program, two types of direct hardware subsidies have been provided by the government: hardware subsidies to poor households and production subsidies to PLM workshops. In the mid 1990s, hardware subsidies were provided to poor households but they were discontinued following decentralization. Production subsidies to PLM workshops are now the main source of subsidies, but they are only paid in certain provinces.

Targeted hardware subsidies to poor households have been discontinued.

In the mid-1990s under the PNSBC, the poor and vulnerable became a specific target for support with improved latrines. Vulnerable segments of the population were identified with the support of the GAPVU (*Gabinete de Apoio a População Vulnerável* – Office for Support to Vulnerable Populations). Vulnerable people were identified by GAPVU in collaboration with local leaders according to established criteria (e.g., single mothers with at least five children, chronically disabled people over 18 years old, elderly people over age 60 more than two years unemployed, etc.). They would receive food subsidies as well as other support. About 10% of the production of the PLM workshops was given to these vulnerable populations with a 100% subsidy towards a complete latrine. Following decentralization, these direct sanitation subsidies were discontinued. INAS (Instituto Nacional de Accção Social – National Institute for Social Action) helps vulnerable people through cash and food transfers but has no contact with the PLM.

Production subsidies to PLM workshops is now the main form of government transfer, although these subsidies are grossly insufficient and have often not been paid since decentralization.

Around 1992, following a sharp increase in the costs of construction materials, production subsidies were introduced and paid directly to the workshops for each unit produced and sold (see Table D.4 above for subsidy levels). Given that the country was still going through the civil war, paying subsidies to the workshops rather than to households was also seen as easier to manage, even though it was clearly supply-driven rather than demand-driven. As discussed in

Section D.3.5, however, decentralization has resulted in those production subsidies not being paid in many provinces, depending on their interpretation of the workshops' legal status.

This method of subsidization can be seen as a crude form of output-based aid, with subsidies paid directly to the provider after the product has been provided. However, OBA usually requires strong monitoring systems in place to ensure that the subsidy is paid when the product has been delivered and that the level of subsidy closely matches demand in order to target the subsidy on the poor. Such monitoring and targeting systems appear to be crucially missing in the current PLM set-up.

Households receive a much higher subsidy when, as in the case of the Maputo workshop, sales prices have not been increased since 2000.

In the case of the Maputo workshop, sales prices have not been updated since 2000 despite cost increases. As a result, the workshop has to cover the cost differential by finding ways of cross-subsidizing the sale of slabs (at a loss) from other income-generation activities.

D.4 Evaluation of the program's performance

In this last section, we seek to evaluate the program's performance at extending household sanitation based on criteria set out in the common methodology for the project. Due to data limitations, it was only possible to carry out this more detailed analysis for the current phase of the program, with a particular focus on the situation in Maputo (as data for other regional workshops was incomplete).

D.4.1 Impact on sustainable access to services

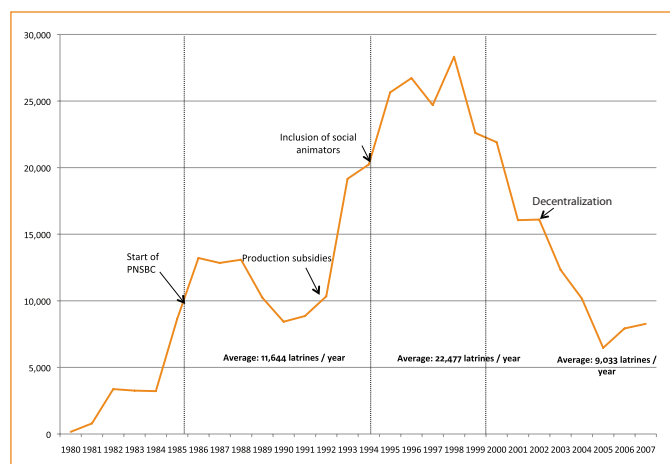
Virtually all improved latrines in peri-urban Mozambique have been built with PLM support.

Since the beginning of the PLM in 1980 in Maputo City, an estimated 363,056 improved latrines have been constructed with PLM support, serving 1,887,891 people in the peri-urban areas of Mozambican cities and towns. As noted in the discussion of coverage figures, this is roughly equivalent to the total number of people having access to improved sanitation.

The program's performance has varied hugely over the years.

As can be seen in Figure D.1 below, the performance of the PLM has varied hugely during the four phases of the program. The most productive phase of the program was from 1994 to 2002, when production subsidies were provided, social animators were carrying out social marketing activities and the central government was providing overall guidance and management. During that phase, the program sold an average of 22,477 latrines per year. Since decentralization, this figure dropped by more than half to 9,033 (between 2003 and 2007).

FIGURE D.1. TOTAL SALES OF IMPROVED LATRINES, 1980 – 2007



Source: Draft Urban Water and Sanitation Road Map

There has been a marked decline in sales since the late 1990s, for a number of reasons:

- **Overall reduction in demand for the PLM products.** In many of the peri-urban areas where PLM workshops are established, economic development in these areas, as well as current sanitation coverage, is such that the PLM workshop no longer has a significant market. Most people now build concrete block houses with internal bathrooms and septic tanks. They would use the cheaper domed slab latrines only for “guards and maids.” The workshops neither have the capacity to move in order to meet demand where it exists (as they cannot invest in building new production workshops closer to the demand) nor can they finance transporting their production to those who

need it, since most of their (often donated) vehicles have fallen into disrepair and they have no funds to buy new ones.

- **A hasty and badly designed decentralization process** combined with the withdrawal of external donor funding resulted in the loss of social animators (the “sales persons” of the PLM) and in a lack of managerial and financial supports to the Provincial PLM workshops. Subsidies to the workshops have often been discontinued, leaving them in a very difficult financial position, with no funds or human resources to carry out promotional activities.

The improved latrines that have been built seem to be well maintained.

There have been no recent studies on usage of the improve latrines. The last study on this topic was carried out in the late 1990s. At the time, that study showed that more than 70% of improved latrines constructed during the previous 17 years were still in use and that a significant number of slabs had been moved to replacement pits. Already in those days, some households had adapted the pits to water flushed systems. The current situation appears to be similar. Anecdotal evidence during latrines visits in the peri-urban areas showed correct usage and good cleanliness, sometimes combining the latrine with the bathing area. A household survey carried out by WSUP in peri-urban Maputo confirms the widespread use of improved sanitation including the improved latrine.

D.4.2 Costs

The hardware costs averaged at US\$70 per improved latrine, including US\$21 for the slab

At the moment, the software costs of the PLM workshops are close to nil for most workshops, as all social animators were moved to the municipalities, so they could not be accounted for specifically, except in the case of a Maputo workshop as described below.

In Maputo, the hardware cost of a slab was US\$14, but the costs of civil servants employed by the workshop added approximately another US\$10 per slab or 42% of total costs.

In the case of the Maputo workshop described above (see Box D.1), this situation is less clear given the high number of civil servants employed at the workshop (even some of these civil servants are not employed as social promoters but rather as administration staff, chauffeurs or guards). In that case, the software cost mark-up amounted to 42% of total costs. This is a very high mark-up considering that the contribution of those civil servants is not entirely clear, as they do not perform any clear managerial role within the workshop, raising doubts about whether the Maputo workshop is not simply a source of employment for civil servants.

A few software activities are carried out by workshop technicians, but with no specific value attached to them. Not all “sunk” software investments in the project can be accounted for.

A few animation activities (such as house visits, school lectures) are carried out by PLM workshop technicians based on the experience they had with the PNSBC in the 1990s. These activities do not have an additional cost since the PLM employees tend to do this in their spare time, at no extra cost to the workshop. All previous investments in software, such as training the masons (let alone the social animators, who subsequently left) and establishing the workshop management structures during the life of the program cannot be taken into account as this was done earlier in the program and there are no statistics on this.

For households, the program provides access to improved latrines at a very affordable cost, including for those earning the poverty threshold.

At the national level, the average sales price of a latrine represents 1.8% of an average household’s yearly income and 4.1% for poor households (at the national poverty threshold). The hardware costs represent 4% of the yearly income of an average household and 9% for a poor household.

In certain cases, these costs may be charged fully to the customers, i.e. where workshops have increased their sales prices and when production subsidies have been discontinued. However, given the type of technical standard adopted, this seems relatively affordable to the local population given current socio-economic conditions.

D.4.3 Effectiveness in the use of public funds

From the public standpoint, it was not possible to calculate an increased access / public funding ratio.

The increased access / public funding ratio is defined as the number of households served with US\$1000 of public investments. However, due to a lack of data on the use of public funds throughout the life of the program, it was not possible to calculate such a ratio.

It is not possible to estimate how much households have invested in improved sanitation nor to estimate the ratio of private/public investments at the national level.

The leverage ratio gives the ratio of private investment for each US\$ of public money spent on the project. Given the lack of reliable financial data and the decentralized nature of the program (with no central data base and variations in implementation strategy from province to province), it is not possible to estimate such a ratio in a reliable manner at the national level. We do not have any information on the amount of public funds which were invested in setting up the program (to create the workshops and train the staff) nor do we have information on the amounts of public subsidies which are paid at present (some provinces pay a subsidy, others do not). In addition, although we have capital cost estimates for latrine costs, we do not know how much households have invested in building latrines.

In the Maputo workshop, the leverage ratio was a mere 0.87 if the costs of civil servants at the workshop are included but rises to 4.36 if those costs are ignored.

We can estimate the leverage ratio (i.e. the amount of private funds invested per US\$ of public funds spent) only for the case of a workshop in Maputo City, on which we have more detailed information (see Box D.1 above). We assumed that the workshop only produced slabs and did not get involved in latrine construction. Public funds correspond to the hardware subsidies, which continue to be paid at the rate of MTn 70 (US\$3) per slab, and the payment of civil servant salaries (as noted in Box D.1, the Maputo workshop is exceptional in the way it employs a high number of civil servants attached to the central government). We do not have staff cost estimates for these civil servants but we formulated an estimate based

on the same salary as contract staff. Private funds include the price paid by households per slab (US\$4) as well as the cross-subsidies from the workshop itself, which must finance the shortfall with other activities.

If salaries for civil servants are taken into account, the leverage ratio was a mere 0.87, i.e., US\$0.87 of private investment was made for each dollar of public money spent. This ratio is likely to be higher in other workshops, which function with less staff and no civil servants. It is possible that this workshop, which is still under the responsibility of the central PLM program, is used as a source of employment for central government staff. Therefore, we also estimated that the leverage ratio if civil servant costs are not included rises to 4.36.

D.4.4 Poverty targeting

The PLM workshops do not particularly target poor customers unless an outside agency such as UNICEF provides support in emergencies (e.g., during a cholera epidemic).

Even though efforts were made when it was the national PNSBC program to assist the poor through the GAPVU, now that sanitation is the responsibility of the municipal councils, there is little the PLM can do to support the poor specifically other than respond to requests from appropriate agencies.

When sales prices have not been updated, as in Maputo, the effective subsidy (including cross-subsidies from the workshops) can be very high, ranging from 75% to 85%.

The subsidy to households can be calculated by comparing the sales price to the actual costs of production. In Maputo, households are paying only 25% of the total production costs for slabs (hardware only) and only 15% of the total costs if the costs of civil servants employed by the workshops are treated as software costs. The remainder of those costs are subsidized by the government via production subsidies to the workshop (11% of total subsidy) and by cross-subsidies from the workshop level.

D.4.4 Financial sustainability and scalability

Financial sustainability is highly uncertain and dependent on other workshop activities.

At the national level, households contribute about 49% of the costs of production for slabs and 43% of the costs of production for latrines. The remainder needs to be financed through cross-subsidies from other activities undertaken by the PLM workshops, which may not be completely legal.

The risk of bankruptcy for PLM workshops is high, which would result in the loss of all investments made in the program. Due to their unclear legal status, workshops cannot borrow from banks, which means that they cannot invest in order to expand their activities sustainably, as a private undertaking may be able to do.

In its current state, the PLM is not scalable as its financial sustainability is in question.

The PLM workshops are struggling to survive with what they have, i.e. with existing buildings and trained staff, but they have no possibility to expand. The program as it stands is therefore not deemed to be scalable. The government is considering adopting a new approach, with the possibility of privatizing production and using the PLM workshops simply as demonstration and education centers. For the purpose of the urban road map, the government has estimated that improved latrines could be built for an average of US\$60, of which 45%, or about US\$25, would be for latrine promotion and health and hygiene education, to be covered by the government. This approach has yet to be tested and costed adequately however.

D.5 Summary evaluation

In this section, we summarize the evaluation of the financing approach based on our set of criteria and draw practical implications for the applicability of this financing approach. Overall, the PLM achieved substantial results in terms of increasing coverage. However, significant changes in program design have led to a gradual decline and the current financial crisis faced by most production workshops throughout the country.

In terms of impact on sustainable access to services, the PLM was critical in getting people throughout Mozambique to adopt improved sanitation, since virtually all improved latrines in the country were built through the program and those latrines appear well maintained. The PLM was most

successful during the development stage (from 1992 to the late 1990s), when production subsidies were paid to the workshops and the central government financed community animators to carry out sanitation marketing activities. Demand for the products started slowing down while these mechanisms were still in place, due to the workshops' inability to expand beyond their existing service area. The removal of community animators was a blow to the program and accelerated the drop in sales.

In cost terms, the price of slabs and of latrines is fairly low when compared to households' income. Hardware costs represent 4% of yearly annual income for an average household and 9% for a poor household. These sales prices are particularly low because they have not been adjusted for inflation, even though production costs had gone up. The program has therefore been successful at maintaining its focus on a low-cost sanitation solution. Such emphasis has probably dampened sales over time, as the areas immediately surrounding the workshops got richer and the population was more interested in higher levels of service, such as septic tanks.

It was not possible to evaluate effectiveness in the use of public funds in detail for lack of reliable information, particularly in the period when substantial public support was provided, which can be considered as the “heyday” of the program.

In terms of poverty targeting, even though the program in theory serves all classes of customers, its emphasis on low-cost solutions makes it attractive primarily to poor customers. When cross-subsidies from income-generating activities carried out by the workshops are taken into account, the prices of slabs and latrines are highly subsidized (up to 85% of actual production costs). As a result, the sales price accounts for less than 5% of a poor household's income.

Financial sustainability at present is highly uncertain, as the production subsidies have been discontinued in certain provinces and workshops have been unable to increase their sales prices in others. Many existing workshops are on the verge of bankruptcy or have already stopped operating.

Even though the program was successfully scaled up from the mid 1980s to the late 1990s, this was highly donor-dependent, and further scale-up is highly unlikely due to concerns about the financial sustainability of the approach.

WHAT SEEMS TO HAVE WORKED?

The national program was effective at supplying a substantial number of improved latrines over a large geographic area in very difficult circumstances. The provision of subsidies to the production workshops, based on sales figures, was an interesting attempt to bolster the supply chain and improve access using output-based subsidies. In 2000, those subsidies were defined based on an analysis of production costs and varied by region to reflect differences in production costs and poverty levels, indicating a reasonable targeting of the initial subsidy program.

AND WHAT DID NOT WORK SO WELL?

Since decentralization in 2002, the program has been less effective for a combination of reasons.

The production subsidies have either been capped at their previous level (and not updated for inflation) or discontinued. Since the sales prices were not updated either in most cases, the PLMs were expected to compensate for these losses by taking on other activities. However, these activities have not been clearly specified, leaving each PLM workshop to invent fund-raising activities in order to survive, including some for which they do not have permits (e.g., civil construction), or which are inappropriate (selling chickens or renting office space) or where they are competing directly with the private sector (e.g. concrete block production). However, it is thanks to such activities that the workshops can cross-subsidize the costs of latrine production and sell them to households at affordable prices.

In many of the peri-urban areas where PLM workshops are established, economic development in these areas, as well as current sanitation coverage, is such that *the PLM no longer has a significant market.* But no mechanisms are in place for the workshops to move to more appropriate areas, in part because there is no real understanding of what the “autonomous” PLMs are allowed to do and also because the workshops are cash-strapped and cannot afford to invest in new premises or new production facilities.

The PLM workshops have been left in a legal vacuum.

During the decentralization process, little thought was given to what the PLM workshops were actually supposed to do or where or how it should fit into the provincial structure. Following decentralization, their legal status was left unclear. They are neither a fully funded public entity nor a private company able to raise their own resources and set tariffs for their services. In many workshops, the workers have never had any type of work contract, thus leaving them in limbo regarding social security, severance pay, etc. However, in the few cases where municipal councils have taken a proactive role in taking on the workshops, these are still working well. This is a clear example of the need for political will to implement effective sanitation programs.

Finally, *no capacity building was carried out to assist either the PLM workshops or the supporting DPOPH in improving their management skills to manage “autonomous” workshops.* Management skills are therefore crucially lacking, which partly explains the poor quality of data (including financial data) available at the workshops. The pool of qualified sanitation people that had been created thanks to software investments at the beginning of the program is gradually being lost.

Annex E - Senegal case study

Case study written by Ousseynou Guène, Chimère Diop, and Sophie Trémolet

OVERVIEW OF SENEGAL CASE STUDY (PAQPUD PROJECT)

Key facts	
Project name	Programme d'Assainissement Autonome des Quartiers Périurbains de Dakar
Project objectives	Scale up the Community Led Total Sanitation (CLTS) approach and strengthen local governments so that they can become main implementers of the approach.
Public financiers	Government of Senegal, World Bank
Scale	366,000 people served in peri-urban areas in and around Dakar (capital city)
Time frame	Program years: 2002 to date / Study period: 2002 to 2005
Level of service	Range of options, from improved latrines to septic tanks
Summary of financing approach	
Software support	<ul style="list-style-type: none"> • Software support for sanitation promotion, including hygiene promotion and education, community organization, technical support • Software mark-up = 20% of total costs of sanitation solution
Hardware subsidies	<ul style="list-style-type: none"> • Output-based hardware subsidies to local sanitation providers for each sanitation solution built • Hardware subsidy: US\$200 to US\$1,000 per household depending on sanitation solution built (75% of hardware costs) • Hardware subsidies = 77% of public funds
Access to credit	<ul style="list-style-type: none"> • Various channels to provide access to credit to households to pay their contributions; limited take-up
Summary evaluation	
Impact on sustainable access	<ul style="list-style-type: none"> • About 22% of population in project area accessed sanitation through PAQPUD • All facilities appeared to be working well, with high levels of satisfaction
Costs	<ul style="list-style-type: none"> • Average hardware costs: US\$568 per household (16% of lowest quintile income) • Operating costs: US\$137 per year (3.4% of lowest quintile income):
Effectiveness in the use of public funds	<ul style="list-style-type: none"> • Low leverage ratio: 0.13 • Low "increased access/ public funding": 1.6 sanitation solution built / US\$1,000 public funds
Poverty targeting	<ul style="list-style-type: none"> • All households in project area eligible for subsidy; in practice, about 22% received the subsidy, the vast majority of them were poor (small inclusion error)
Financial sustainability	<ul style="list-style-type: none"> • Public funds = 89% of total costs of sanitation adoption (low sustainability)
Scalability	<ul style="list-style-type: none"> • Scaling-up PAQPUD to serve the population not yet covered would be very expensive, accounting for a substantial share of the national budget

OVERVIEW OF SENEGAL CASE STUDY (PAQPUD PROJECT) CONTINUED

Some lessons learned

What worked?	<ul style="list-style-type: none"> PAQPUD was successful at raising the profile of on-site sanitation, which was neglected up to that point, and met the needs of a population of over 400,000 people.
What did not work so well?	<ul style="list-style-type: none"> High subsidies were offered for all sanitation solutions (as a percentage of costs, resulting in higher subsidies for costlier solutions) with limited targeting. Household contributions were reduced (from 50% to 25% of hardware costs) to increase take-up, but recipients still have difficulties or are unwilling to invest. Attempts at providing credit to spread household contribution (which must be paid up-front) have largely failed. Current approach is costly and not scalable to meet MDGs.

E.1 Overview of the financing approach

PAQPUD (*Programme d'Assainissement Autonome des Quartiers Périurbains de Dakar*) provided sanitation services in poor peri-urban areas around Dakar, Senegal's capital. The program, which was developed between 2002 and 2008, offered a wide range of sanitation options, mostly on-site facilities as well as small-bore sewers in areas where on-site sanitation could not be considered for technical reasons. Over that period, the program benefited over 400,000 people, although a large proportion of the facilities built were for management of gray waters rather than human excreta. The hardware costs of the sanitation facilities built through the program varied substantially depending on the option retained, with an average of about 568 per household covered (bearing in mind that each household received 1.56 sanitation facilities on average).

Software support was provided to develop a catalog of services, promote sanitation and hygiene and organize community mobilization. On average, software support represented US\$144 per sanitation solution built, or 20% of the total costs of sanitation adoption. The entrepreneurs building the sanitation facilities were paid directly through the project for every item built based on a catalog of services. This is equivalent to an output-based subsidy, something which was later formalized through an extension of the project via the GPOBA. The beneficiary households were required to make an up-front contribution in order to obtain access. Based on a willingness-to-pay survey, households were initially required to contribute 50% of hardware costs, but the hardware subsidy was subsequently increased to cover 75% of hardware costs, given limited demand for the facilities and a low

take-up rate. The hardware subsidy provided by the program ranged between US\$200 and 1,000 per sanitation solution, depending on the costs of each solution. Access to credit was provided in the second phase in order to spread the burden of this contribution over time.

This case study starts by providing some brief background on the country and sanitation context. We present the way in which on-site sanitation was provided through the project before analyzing the costs of such provision. We then evaluate the performance of the financing approach for on-site solution, focusing on impact on sustainable access to services, costs, effectiveness in the use of public funds, poverty targeting, financial sustainability and scalability. A summary section draws out key lessons learned, looking at what seems to have worked and what did not work so well.

E.2 Country and sanitation sector context

E.2.1 Country context

Senegal is a West African country with a population of 11.3 million, of which 40.7% are qualified as urban. GDP per capita in 2007 was estimated at US\$914 at current exchange rates, but was US\$1,692 at PPP-adjusted exchange rates.

E.2.2 Initiatives taken to increase coverage

Up to 1996, SONEES (*Société Nationale d'Exploitation des Eaux du Sénégal*), a publicly-owned company, was in charge of water and sanitation services in urban areas throughout the national territory. With respect to sanitation, SONEES was managing the sewerage systems in Dakar (the capital) and six other urban centers where such

networks had been built. Reforms of the water and sanitation sector were initiated in 1995 under a World Bank loan, the *Projet Sectoriel Eau (PSE)*. The national company was split into three entities: two in the water sector, including SONES (*Société Nationale des Eaux du Sénégal*), a publicly-owned asset-holding company, and SDE (*Sénégalaise des Eaux*), a private operator operating under an affermage contract.¹ Responsibilities for sanitation services were spun off to a dedicated public office, ONAS (*Office National de l'Assainissement du Sénégal*). During the first phase of the reforms financed by the PSE, most investments were allocated to the water sector as it was considered urgent to increase water production, reduce leaks, improve service efficiency and extend coverage of water services. The sanitation sector was somewhat neglected and sanitation coverage did not increase much. There was a perceived lack of political will to promote on-site sanitation solutions.

The *Programme Eau à Long Terme (PLT)*, initiated at the end of 2001 with World Bank financing, intended to redress these imbalances by allocating more resources to the sanitation sector. One component of this overall program was the *Programme d'Assainissement Autonome des Quartiers Périurbains* de Dakar (PAQPUD), the first government-led program to provide support to on-site sanitation solutions (only NGOs had provided support in this area up to that point). This program targeted peri-urban areas of the capital, where it was deemed too expensive or impractical to extend conventional sewerage networks. Whereas previous on-site sanitation programs had not met with much success in Senegal, this proved to be more successful thanks to social mobilization and demand-generation activities being put in place.

E.2.3 Access to sanitation in urban areas

In 2002, the access rate to sanitation among urban households stood at 64% in the Dakar region, of which 25% had access through a sewerage system. Coverage was much lower in secondary towns (around 39% coverage, mostly with on-site sanitation). Access to sanitation in rural areas was even lower, with only 17% of households having access to an improved sanitation solution.

To meet the MDGs and reduce by half the number of people without access to water and sanitation, the government established the PEPAM (*Programme Eau Potable et Assainissement pour le Millénaire*). In the urban sector, PEPAM's objective is to bring the overall urban sanitation coverage from 56.7% in 2002 to 78% in 2015. The rate of progress towards achieving these objectives was deemed to be slow as of 2008, partly due to a low level of financial resources being mobilized and spent on sanitation.

E.2.4 Institutional set-up for sanitation

At the national level, sanitation is under the responsibility of the Ministry of Urban Planning, Habitat, Public Hygiene and Sanitation. This ministry includes two operational directorates, DAS (*Direction de l'Assainissement*) which is responsible for overseeing sanitation in rural areas and overall sector planning, and DPIC (*Direction de la prévention individuelle et collective*), which is responsible for ensuring the adoption of hygienic practices.

ONAS, a public agency, is responsible for sanitation in urban areas throughout the country under the supervision of DAS. As part of its overall responsibilities, ONAS is in charge of developing on-site sanitation solutions and has overall responsibility for managing PAQPUD.

E.3 PAQPUD program design

E.3.1 Program overview

The general objective of PAQPUD was to help improve the living conditions of low-income populations in the peri-urban areas of Dakar by providing access to better sanitation services. The program focused on the provision of sanitation services and included household sanitation, small-bore sewers, community sanitation (public toilets), school sanitation, and sludge treatment facilities.

The program also served as a platform for building the capacity of actors in the subsectors, and promoting hygiene and technologies that had been used only sporadically up to that point. The program aimed to increase the technical skills of

¹ An affermage contract (or lease contract) is a contract under which a government delegates the management of a public service to a company in return for a specified fee. In Senegal, the operator receives a fee based on the volume of water sold.

small entrepreneurs and service providers and to improve the ability of ONAS and NGOs to manage sanitation projects in peri-urban areas. The project sought to adapt sanitation to the sociocultural and financial context of the populations by offering technical solutions that were effective and capable of evolving over time and space, with a view to achieving the MDGs. The program was divided into two phases: a pilot phase from 2002 to 2003 (two years) covering four municipalities (*or communes*) (Sicap-Mbao, Wakhinane-Nimzatt, Ouakam, and Ngor), and an expansion phase from 2004 to 2006 (three years), which was subsequently extended until December 2008 for the construction of collective facilities and sludge treatment plants. The expansion phase covered 31 municipalities, including the four aforementioned ones.

Pilot phase, 2002-2003. The activities conducted during the pilot phase yielded poor results (approximately 600 on-site sanitation facilities were built, including wash basins and latrines) owing to a number of factors, including in particular:

- A high household contribution rate (50% of the hardware costs);
- The low level and lack of skills of a number of the actors, including for technical supervision and within the NGOs;
- Delays in the implementation of several components, such as mass communication (mass-media, posters, etc.); and
- The fact that on-site sanitation facilities (the only ones on offer during the pilot phase) were not suitable for several areas of the four targeted municipalities.

In particular, the NGOs that had been recruited had only had experience with highly subsidized programs (95%) and they were not eager to change their ways of operating and request households' participations more than they used to in previous programs. They had high management costs, demonstrated little flexibility to play by the project rules and were not used to working towards specific performance targets and on a given time frame. This delayed the implementation of the program and impacted the population's willingness to make their contributions.

Expansion Phase, 2004-2008. For the expansion phase, ONAS modified a number of the parameters with a view to improving results. The beneficiaries' contribution rate was lowered to between 20 and 25% of the hardware costs, depending on the type of facility. Technical contractors (consulting firms, consultants) were recruited and tasked with serving as intermediaries between AGETIP² and the artisans responsible for construction and supervising construction work. Community supervision of the project was also reorganized with the recruitment, in tandem with the NGOs responsible to date for this component, of community based organizations (CBOs), which are closer to the households. Extension workers were given incentives to make a high number of household visits and to be remunerated based on results. Lastly, AGETIP recruited firms specializing in mass communication (mass media, posters). These measures helped to significantly increase the program's efficiency and the access rate to sanitation services.

E.3.2 Program institutional set-up

As project manager, ONAS was responsible for implementing PAQPUD, which was achieved through an implementation agreement between the Government of Senegal and ONAS. ONAS outlined the objectives and activities, and then implemented the program on the state's behalf. In order to effectively achieve the program's objectives and manage on-site sanitation solutions, ONAS established a program coordination unit (PCU) and signed, along with AGETIP, a delegated management contract for a fee of 5% of all services provided.

As the program's delegated executing agency, AGETIP was responsible for implementing the program by recruiting private service providers. AGETIP selected, supervised, and paid the service providers that implemented the program's various components, including the main technical contractors, the community project supervisors, and the SMEs and artisans for the provision of materials, labor, and construction work. It was responsible for managing the contracts, ensuring the quality of work and reaching the contractual targets.

² AGETIP is a private NGO that was established in July 1989 to execute projects aimed at reducing underemployment which were deemed to be economically and socially beneficial. It was established as an association and signed a contract with the State so that it can manage public funds in the manner of a private enterprise.

The main technical contractors (consultants, consulting firms) that were recruited by AGETIP during the expansion phase helped to improve monitoring of the quality of the facilities and compliance with work deadlines, through close monitoring and assistance provided to the contractors to resolve any technical problems. The contractors, who were paid more quickly and received technical assistance, were able to improve their performance, thus helping to increase the program's responsiveness to meeting needs.

Community mobilization (including collecting beneficiary contributions, support and follow-up) was entrusted to community based organizations (CBOs) during the expansion phase instead of the NGOs used during the pilot phase. Community supervision had initially been entrusted to three NGOs, which had not facilitated program ownership by the populations, and contributed to the inertia inherent in the beginning of any program. CBOs were specifically recruited instead of the NGOs to reduce or eliminate this inertia. The CBOs took advantage of their proximity to the grassroots communities in several ways:

- Appointing residents of the towns to serve as facilitators to mobilize the populations' support;
- Making optimal use of households, given their in-depth knowledge of the communities; and
- Effectively managing collection efforts; in the case of the households, not paying a debt contracted through a resident is tantamount to compromising one's respectability in the community.

Lastly, a local project committee was established in each program area in order to have a representative for the beneficiaries present for certain contractual procedures, including investments for semi-collective or community systems, monitoring activities, and the operation and management of semi-collective or community facilities. The local project committee was composed of local, religious, and traditional authorities, representatives from associations, representatives from the public and private sectors and civil society, ONAS and AGETIP representatives, and community project supervisors in a support role.

The local project committee members are volunteers. The local project committee was responsible, among other things, for outlining the choice of facility and its funding, ensuring social mobilization in the communities and ensuring the financing of contributions by the populations.

E.3.3 Levels of service

*The program offered a broad range of technical options, with capital costs ranging from CFAF 21,917 (US\$40 at the 2005 exchange rate) for a clearing device to separate cooking oils from gray water (*dégraisseur*) to CFAF 734,966 (US\$1,395 at 2005 rate) for a septic tank with three compartments. Not all sanitation options could be offered in each area, as their feasibility depends on soil conditions. A catalog of potential technical options was prepared for each geographical area, based on a detailed analysis of soil conditions. The costs of each facility were the same across the whole project area. Households could select their preferred options based on this catalog and on their ability to pay.*

The sanitation options on offer can be classified as follows:

- Gray water disposal facilities, to discharge water used for cooking, washing and bathing;
- On-site excreta disposal options, ranging from dry facilities such as VIP latrines to water based options, such as septic tanks and pour-flush toilets;
- Semi-collective sewerage systems and public toilets.

Operating costs for each type of installation have been evaluated based on technical factors. For example, in the case of all sewerage work, a period greater than or equal to three years with respect to the filling of septic tanks was used as the working hypothesis. Operating costs relate to ongoing maintenance, cyclical maintenance, preventive maintenance, and corrective maintenance.

Capital costs and operating costs for the main on-site sanitation solutions are presented in Table E.1.

TABLE E.1. CAPITAL COSTS AND OPERATING COSTS FOR MAIN ON-SITE SANITATION FACILITIES (2005 US\$)

Sanitation facility	Capital	
	costs	Operating costs per year
Washing facility and soakaway (BALP)	261	45
VIP Latrine + shower	672	101
Pour-flush latrine + shower	739	129
Toilet connected to small-bore sewer	910	140
Toilet with water-tight pit (fosse étanche)	910	170
Toilet with septic tank	1,393	147

Note 1: The BALP only allows getting rid of gray water and is not a solution for elimination of human excreta.

Note 2: As the CFAF is pegged to the Euro, it has appreciated against the US\$ throughout the project period. For example, a toilet with septic tank cost CFAF 734,966 according to the project catalog. This was equivalent to US\$1,054 at the start of the project in 2002 but rose to US\$1,709 in 2008, which is equivalent to a 60% increase in US\$ terms. For our purposes, CFAF costs were converted using 2005 average rate (1 US\$= 528 CFAF), as this is the date by which all on-site sanitation facilities had been built. This exchange rate is close to the average exchange rate for the entire project period.

E.3.4 Total PAQPUD program costs

The overall costs for the PAQPUD program at the end of October 2008 are presented below.

TABLE E.2. SUMMARY OF PROGRAM COSTS (END OCTOBER 2008)

In 2005 US\$ (1 US\$ = 528 CFAF)	Program costs	Household contributions
Total hardware costs	32,626,000	-
Household sanitation	19,853,000	3,354,000
Sanitation systems and treatment stations	12,773,000	-
- Public toilets	102,359	-
- School sanitation	813,455	-
- Collective and semi-collective networks	10,052,000	368,000
- Treatment centers	1,805,000	-
Total software costs	10,053,000	-
Hygiene promotion and communication	6,395,000	-
Program management (AGETIP & ONAS)	2,447,000	-
Technical assistance / works supervision	1,211,000	-
Total costs	42,679,000	3,722,000

Total software costs accounted for about 30% of investments costs and were split as follows: 5% were charged by AGETIP as a management fee, 2.5% was charged by ONAS, 20% went to finance hygiene promotion and communication activities and approximately 4% went to site supervision. For on-site sanitation, the amounts spent on hygiene promotion and communication were slightly lower, standing at 18% of investment costs in this area.

E.3.5 Sources of finance for household on-site sanitation

Table E.3 see 127 shows the costs and sources of finance for household on-site sanitation, including PAQPUD project funds (financed through a World Bank loan) and household contributions. Hardware costs are the actual costs of household sanitation, although a portion of software costs has been allocated to this component using the ratios mentioned in the section above and applying such ratios to the household sanitation hardware costs. These costs are expressed in 2005 US\$ as the construction of household sanitation solutions stopped at the end of 2005.

Whereas households were asked to contribute 20% to 25% of hardware costs, their contribution accounted for only 11% of total costs after software costs were taken into account, as shown in Table E.3 below. Note that the table shows the maximum amount of household contributions likely to be mobilized. As of October 2008, CFAF 107.8 million (or 6% of total household contributions) were still outstanding.

TABLE E.3. TOTAL COSTS FOR THE HOUSEHOLD SANITATION COMPONENT (2005 US\$)

	Hardware	Software	Total	% of total
PAQPUD project	19,852,000	5,857,000	25,709,000	89%
Household sanitation investments	19,852,000			
Hygiene promotion and communication		3,573,000		
Program management		1,489,000		
Technical assistance / work supervision		794,000		
Household finance	3,267,000		3,267,000	11%
Total	23,119,000	5,857,000	28,976,000	100%
% of total	80%	20%	100%	

E.3.6 Subsidy design

The PAQPUD project provided a high subsidy for hardware costs (70% to 75% of hardware costs depending on the technical solution). The subsidy was paid in-kind, given that the program financed the construction of the facilities at the households' premises, following payment of the households' contribution, usually in cash (payment in-kind was offered as an alternative but was not popular). The subsidy amount was increased from 50% to 75% following a slow program start.

Definition of the subsidy amount. With a view to fixing the subsidy amount, a study to determine the populations' willingness and ability to pay was conducted in seven district communes. According to this study, the majority of these populations (in six of the seven communes) indicated their readiness to contribute up to 50%. However, poor take-up rates during the pilot phase showed that this rate of contribution was too high: after two years of implementation (2002-2003), there was very low take-up relative to expressed demand (on the order of 14%).

Slow take-up during the pilot phase could be attributed to a series of factors:

- The contribution rate of 50% applied to hardware costs translated into amounts that were excessive in relation to the income of the targeted households, especially in the absence of credit facilities. Previous NGO-led programs had been offering a 95% subsidy and the population therefore was expecting a similar level of financial support.

- Prior to the start of construction of the facility, the household was required to pay its contribution up-front and in full, which, in addition to the financial barrier, meant that the program was not assuming any risk and that the households therefore bore full responsibility.
- Owing to its novelty, the low level of participation of local and political leaders, and the delay in launching the mass communication component, the program was not well known and did not have enough credibility to reassure even the households that could or wanted to pay their contributions in installments.
- During the pilot phase, the technical solutions on offer, which consisted solely of individual facilities, were unsuitable for several areas in the four targeted towns, either because of a high water table, a lack of space on the plots of land, or the existence of a virtually impermeable rocky substrate. This discouraged the targeted populations who were cognizant of the fact that the construction of individual facilities was not a viable solution.

In January 2004, a series of changes were introduced to address the perceived shortcomings of the first phase of the program. Household contributions were brought down from 50% to 25% for excreta management facilities and to 20% for gray water management facilities (with an increase in subsidy). Households were given the possibility to spread payment via credit. The institutional set-up was modified, with community-based organizations managing the project level rather than NGOs.

Rules on subsidy eligibility. Subsidy eligibility for households was subject to the following criteria:

- The household must be located in one of the areas targeted by the program;
- The requested facility must be included in the program's investments catalog;
- The requested facility must be technically feasible in terms of the site's physical characteristics (water table level, presence of rocks, space on the plot of land); and
- The household must be willing to contribute the percentage amounts stipulated by the program, depending on the type of solution. This contribution is paid up-front, prior to construction of the facility.

The community project manager and the main technical contractor were responsible for processing the request. The procedure was initiated once the main technical contractor had examined the site's parameters to determine the feasibility of constructing a sanitation solution and the community project supervisor has received the household's support and contribution to finance the facility.

The CBOs developed initiatives to finance the contribution from the poorest. These included:

- The search for sponsors (locally based companies such as SHELL, institutions such as UNDP, and local entities) to finance the contribution from the poorest; and
- The appeal to local authorities that drew on their own resources or used resources derived from decentralized cooperation.

Impact of the methods for mobilizing household contributions on program performance. The program faced a number of difficulties with respect to mobilizing the household's contribution to the project. Two types of approaches were adopted by the program to secure the payment of household contributions: dealing directly with households or through an organization. The advantages and drawbacks of these alternative approaches are presented in Table E.4 see page 121.

Impact of credit on program performance. During the second phase of the program, households had the opportunity to secure credit to spread payments of their contribution over time, based on three options:

- *Credit from the program:* Under this mechanism the site was opened once the household had advanced a portion of the contribution, with the determination of the amount of this advance being left to the discretion of the CBO, which is then responsible for collecting the balance.
- *Credit from the community association:* Women were generally members of an association in their community and were accustomed to organizing tontines (rotating savings and credit associations) to facilitate payment of individual projects. They needed only to be apprised of this option for tontines to be organized specifically for the acquisition of sanitation facilities.
- *Credit from a micro-credit institution:* Only the PAMECAS entity offered its services for the PAQPUD. Households could access credit to finance their contribution after opening an account, mobilizing one-third of the requested amount and making a commitment to pay the principal and interest of the loan.

Only the first two options generated enthusiasm from households for the following reasons:

- The process to make credit available was simplified as there were very few formalities;
- Credit could be provided in-kind (the program) or in cash (*tontine*);
- Credit was provided interest-free, and therefore payment of the principal only was required; and
- Credit management was community based, which contributed to a high collection rate because of community oversight; 95% of household contributions were collected using this system.

The advantages of credit for the households were that financing needs could be spread over a longer period and risks could be shared between the program and the households, in contrast to the ex-ante payment of the contribution which leaves the household with the impression that it is assuming sole responsibility for all risks. The introduction of credit therefore improved relations between the program and households by establishing greater symmetry, equity, and confidence between them.

TABLE E.4. ALTERNATIVE METHODS FOR COLLECTING HOUSEHOLD CONTRIBUTIONS

Approach	Advantages	Drawbacks
Approaches where the project deals directly with the households		
The contribution is collected from the household in cash and in full before the site is opened.	– Allows for collection in full of all household contributions.	– Negative effect on the results of the program in terms of facilities constructed because the amount to be paid represents a significant share of the household’s income.
The contribution is collected from the household in cash and in installments, and the site is opened once the household has paid a certain amount of the contribution (flat fee of CFAF 10,000 or one-third of the contribution amount).	– Boosts the program’s results in terms of facilities constructed.	– Risk of noncollection of a portion of the households’ contribution.
The contribution is in-kind and entails the construction of the superstructure by the household. In this case, the site opens once the household has been registered.	– Facilitates access by the poorest by removing the financial barrier. - Possibility of a reduction of the household contribution if rules governing construction of the superstructure are relaxed.	– The standards established for the superstructure are not necessarily adhered to. - Negative influence on the willingness of the other households to pay.
Approaches where the project deals with an organization		
The community organization has a fund that is financed by the contributions from all household members. It deposits the amount corresponding to the contributions from member households, in cash and in full, into the program’s account. The opening of the site is contingent on payment in full of the contributions.	– Allows for collection in full of all household contributions in a very short period of time.	– Individual opinion is suppressed because the household has lost its main means of exerting pressure, which was the ability to solely decide whether or not to pay its contribution.
A sponsor assumes responsibility for the contributions from targeted households, which are paid in cash directly to the program. Sites are opened once the contributions have been paid in full.	– Allows for access to sanitation by the poorest by removing the financial barrier.	– Negative influence on the willingness of the other households to pay, who begin to believe that the facilities are being provided free of charge.

By contrast, giving households the possibility to make their contribution in-kind, by building the superstructure while the program was responsible for the main components of the latrine, has had limited take-up. Only 283 pour-flush latrines were built in that way (0.45% of the total number of latrines built). This solution was only offered to the very poor and only for the TCM-douche model (pour flush latrine + shower), which was the type of latrine that was most in demand.

E.4 Evaluation of program performance

E.4.1 Impact on sustainable access to services

The PAQPUD program provided sanitation to 366,039 people in Dakar's poor peri-urban areas, which is equivalent to 22% of the population in the program area.

The PAQPUD program led to the construction of 63,548 on-site sanitation solutions, which was more than the original objective of 60,000 and two years ahead of schedule.³ On average, households benefited from 1.56 sanitation solutions per household, since many of them built facilities for dealing with gray water as well as excreta disposal. This means that the program reached 40,671 households, which is equivalent to 410,507 people (based on the PEPAM benchmark estimate of nine persons per household). Approximately 22% of the population in the project area (of 1,694,904) received sanitation facilities through the program.

In addition, the program was successful at establishing a social intermediation program and strengthening the ability of public bodies to carry out such programs.

Social engineering activities targeted, without restriction, all populations in the program area and exceeded construction projections. These activities included house visits, PHAST⁴ meetings or meetings with the local project committees.

Only 57% of the facilities built were solutions for safe excreta management.

The most popular technical sanitation facility was the BALP (*Bac à Laver Puisard*), which represented 43% of the number of facilities built. The BALP proved very popular as it was the cheapest solution on offer and helped families in managing gray water, which is often a reason for conflicts between neighbors in densely built areas. Although these facilities do not allow for safe management of human excreta (except for babies and small children), they have made a significant contribution to improving the cleanliness of the immediate environment; they helped eliminate stagnant grey water in the yard and in the street and reduced the prevalence of insects, odors and rodents with potentially significant health impacts.

The pour-flush latrine was the second most popular facility (31%). It qualifies as improved sanitation by the definitions of the UNICEF/WHO Joint Monitoring Programme, adopted by this study. The least popular option was the septic tank (4%), which can probably be explained by its comparatively higher costs.

Offering connections to small-bore sewers improved the attractiveness of the program.

Approximately 8,827 households, that is, 87,387 inhabitants, were connected to a small-bore sewer network, after construction, where necessary, of an interceptor tank for the household. Offering connections to collective sanitation networks during the second phase boosted demand in these ways:

- Through the provision of solutions adapted to contexts that had previously been neglected, which allowed for inclusion of the sectors in the program area for which the individual solutions were not technically feasible;
- Through increased awareness of the program, because households considered the network connection to be very attractive as it was synonymous with integration into a real city; and

³ An additional allocation from the proceeds of the World Bank loan led to the construction of an additional 3,562 facilities. This second phase ended in May 2008. These additional facilities were not included in the detailed analysis as we did not have detailed information on their associated costs.

⁴ PHAST stands for Participatory Hygiene and Sanitation Transformation, and is a well-established method for carrying out hygiene promotion activities.

- In areas with high water tables, small plots of land, or rocky soil, the prospect of being connected to the sanitation network boosted demand for individual facilities. A facility such as a water tight pit or a septic tank was indeed essential before connection to the small-bore sewer network could be provided.

All facilities appeared to be working well as of late 2008 and households were satisfied with the outcome, except in some cases with the connections to the small-bore sewers, as there were some delays in implementation of that program component.

E.4.2 Costs

The total costs of building sanitation facilities were US\$712.4 on average, of which 80% were spent on hardware (US\$568) and 20% on software (US\$144).

These costs have been calculated by dividing the total costs of providing on-site sanitation by the number of households reached, rather than by the number of facilities, to reflect the fact that households served received 1.56 facilities on average. This reflects the approach of the program to provide complete coverage of all sanitation and hygiene needs to a few families rather than partial coverage of some needs to a larger number of families.

We did not have access to a breakdown of total hardware costs for the households that obtained excreta management facilities. If we did, the average costs would likely be higher. The hardware costs of these options are high (as shown on Table E.1 above), particularly for a toilet with septic tank, which costs US\$1,393. This may explain the very limited take-up of such facilities and people's preferences for cheaper options (such as the BALP, at US\$261).

Even though these costs are high, they were comparatively lower than the costs of previous NGO-led programs with very high rates of subsidy (up to 95%), except for programs conducted in secondary towns where input costs tend to be lower. At design stage, several studies were carried out in order to identify cheaper technical solutions, but there are a number of exogenous factors that partly account for such high costs. First, hardware costs tend to be higher in Dakar than in the rest of the country or than in the surrounding region because input costs are higher, in particular labor

and cement costs. In addition, the water table is very high in certain areas, which means that higher quantities of cement must be used. Finally, the local currency (CFAF) is pegged to the Euro and tends to be over-valued versus the US\$.

With respect to software costs, the costs of technical and social supervision were comparatively high, because the PAQPUD program offered a broad range of sanitation solutions and the program required a comparatively higher and more diversified level of technical expertise. The institutional set-up, with several institutions responsible for program management and technical supervision under delegated arrangements, may also account for comparatively higher software costs.

Finally, the PAQPUD program financed some activities to build ONAS's capacity over the long term, such as the setting up of a GIS database covering all on-site sanitation facilities to integrate with the ONAS GIS database of collective sanitation systems or the training of ONAS staff on condominal sewerage. It was not possible to separate such costs out for lack of specific data.

The costs of software activities (such as hygiene promotion and mass media campaigns) per household reached overall were much lower, at US\$18 per household.

Approximately 97% of the population in the project area was reached through hygiene promotion and mass media campaigns. The costs of these activities alone (without work supervision or program management) stood at US\$18 per household. It is difficult to evaluate the impact of such activities, however, and to differentiate their impact from increasing the level of subsidy to boost demand.

From the public standpoint, the increased access / public funding ratio was low, with only 1.6 households provided with sanitation facilities per US\$1000 of public funds spent.

This reflects many factors: on the one hand, each household served by the program could have access to 1.56 sanitation facilities, which would at least include a gray water management facility and in some cases a latrine. The levels of service were therefore quite high, as were the unit costs of the solutions on offer. Finally, the high level of public subsidy made the program expensive for the public purse.

While capital expenditure represented a high share of household income, household contributions (after the subsidy) represented 1% to 15% of income, depending on the solution and income bracket.

Table E.5 below shows capital costs, operating costs and household contributions as a percentage of income for average income in the project area (Av Inc), poor households (Poor Inc) and the bottom quintile. This table shows that capital expenditure accounts for a substantial portion of household income, ranging from 6% for a BALP for an average household to 59% for a toilet with septic tank for a hardcore poor household. The household contribution (taking account of the subsidy) is much more accessible and is in fact not significantly different from the ongoing operating costs for some of these solutions (especially the BALP), which explains their popularity.

Operating and management costs stood at US\$138 per household per year on average

There was considerable variations in operating costs depending on the technical solution retained, however, ranging from US\$45 for a BALP to US\$170 for a toilet with water tight pit. These estimates are at the upper bound of how much it costs households to operate them, however. For example, for a BALP, they included daily cleaning of the facilities with water, soap and bleach as well as regular maintenance, which many households would save on depending on what they can afford. In addition, labor can be provided by the households themselves, which can greatly reduce the cash outlay required to keep the installations going.

E.4.3 Effectiveness in the use of public funds

A critical issue is the program's heavy reliance on public funding: US\$1 of public funds was used to leverage only US\$0.13 of private funds via household contributions.

As mentioned above, the size of household contributions was reduced, which means that households financed only 11% of total project costs (including software costs). Difficulties in mobilizing investments from households may be due to the high cost of the sanitation solutions on offer, which represent a high share of the local population's income and lack of credit facilities.

Offering credit to the population as a way of boosting household investment was tried during the second phase of the program and the GPOBA extension, but this was deemed difficult and is taking time. Local microcredit institutions are used to offering their products for income-generation activities rather than this type of household investment.

E.4.4 Poverty targeting

PAQPUD targeted the most poverty stricken areas in the Dakar region

Subsidies were primarily granted to poor households, through two types of targeting mechanisms:

- The program focused mainly on peri-urban areas deemed poor and lacking in appropriate sanitation systems. While 33% of the population in the Dakar urban area was living below the poverty line in 2002, 66% of the population in the program areas was below this line.

TABLE E.5 – CAPEX, OPEX AND HOUSEHOLD CONTRIBUTION AS PERCENTAGE OF HOUSEHOLD ANNUAL INCOME

	Capex as % of ...			Household contribution as % of ...			Opex as % of ...		
	Av Inc	Poor Inc	Bottom quintile	Av Inc	Poor Inc	Bottom quintile	Av Inc	Poor Inc	Bottom quintile
BALP	6%	7%	11%	1%	1%	2%	1%	1%	2%
VIP latrine + shower	16	19	28	4	5	7	2	3	4
Pour-flush latrine + shower	18	21	31	5	5	8	3	4	5
Toilet connected to small-bore sewer	22	25	38	6	6	10	3	4	6
Toilet with water-tight pit	22	25	38	6	6	10	4	5	7
Toilet with septic tank	34	39	59	8	10	15	4	4	6

- Within the communities, the community project supervisors (associations of youths or women residing in the community) usually visited households that either lacked or had substandard sanitation facilities, based on their sound knowledge of the area.

A study carried out at the design stage established that such geographical targeting was going to be the cheapest targeting method, as other more specific methods would have been extremely costly and would not have brought a significant difference compared to the costs involved.

Anecdotal evidence shows that a few comparatively richer households benefited from the program, particularly during the pilot phase.

No study has been carried out to evaluate inclusion and exclusion errors. There was some anecdotal evidence that a few comparatively richer households benefited from the program during the pilot phase (and therefore paid a 50% contribution). In some cases, they had a positive impact on the program as their participation served as a demonstration factor for other households.

E.4.4 Financial sustainability

Public funds accounted for 89% of total initial costs, pointing to a low financial sustainability.

Households were responsible for covering operating costs, however, and a good level of maintenance of the existing infrastructure indicates that they were willing and able to finance such expenses once the infrastructure has been built.

Lack of public funding has put the program on hold, leaving interested households unserved.

Allocated funding for the household sanitation component was used up at the end of 2005 and construction of on-site facilities had to stop, leaving 70,400 demands for facilities unmet as of late 2008. Those households have applied for a sanitation solution, a technical feasibility study has been carried out, and the households are ready to pay their contribution but there are no project funds to meet their demands. The PAQPUD project continued till 2008 in order to complete the construction of collective equipments, such as sludge treatment plants.

An extension of the PAQPUD project has been defined with GPOBA financing to serve an additional 15,100 households. The design of the GPOBA program largely built on the PAQPUD project but with a number of key modifications, such as a stream-lined technical catalog and the requirement of no more than one facility per household. A maximum subsidy ceiling of US\$487 per household on average was set for the program as a whole, although the subsidy for more expensive facilities such as a toilet and shower can go up to US\$757 per household.

The project has been relatively slow to start, however. The gap between the two projects has led to a partial waste of resources, particularly in social mobilization. The households that have applied for a subsidy do not seem to invest in the facilities themselves (i.e. without a subsidy) as they may be waiting for extensions of the program to materialize and their economic situation has deteriorated sharply in recent years due to the food crisis, the rise in energy costs and the global economic crisis. The sector's stakeholders are unanimous in emphasizing the necessity to rapidly resume funding to preserve the trust and dynamics of the program.

E.4.5 Scalability

Serving the 70,400 households that have expressed demand would require another US\$54.5 million, to cover hardware subsidies and software costs.

This represents 514% of the annual sanitation budget for the entire country, which was estimated at CFAF 4.5 billion in 2008 (or US\$10.6 million at 2008 exchange rates). Besides, this demand is only the outstanding demand within the original boundaries of the project. Meeting the MDG by 2015 would require building an additional 135,300 on-site sanitation facilities, which means that more than double this amount would be required. At current levels of spending on sanitation, scaling up the PAQPUD program approach would clearly be unattainable.

Concerns that the sanitation MDGs will not be met due to lack of funds are legitimate.

Additional funding would need to come from external sources (as is the case with the GPOBA program, which is providing grant financing) or through an increase in the

share of the sanitation budget out of the total budget. The sums needed to meet unmet demand under the original PAQPUD project represent 1.42% of the national budget, which seems relatively small but would most likely not be mobilized given other competing pressures on limited funds. Given that mobilizing such additional financing is very unlikely, a change in approach, with cheaper facilities or more leveraging of private investments, is therefore needed. Scaling up the current approach would require a high level of financing that is not currently available.

E.5 Summary evaluation

In this section, we summarize the evaluation of the financing approach based on our set of criteria and review what seems to have worked and what did not work so well. Overall, PAQPUD achieved significant impact, but questions about the costs and the financial sustainability of the scheme mean that scaling up this program to meet the Millennium Development Goals is unlikely to be achievable for lack of funding.

In terms of impact on sustainable access to services, PAQPUD led to substantial increases in coverage in its program area.

The program served about 366,000 people in the peri-urban areas of Dakar, who previously had no facilities and were using public toilets or a neighbor's toilet or were defecating in the open. The target number of facilities was overshot and built ahead of schedule. The program was a "victim of its own success" since investments in household facilities had to stop early, not for a lack of demand (more than 70,000 households expressed a demand and could not be served) but due to a lack of funding.

In cost terms, the costs of sanitation facilities provided under the program are high. The program offered a range of sanitation solutions, and households could choose one or several based on the physical characteristics of their plots and what they could afford. The most popular facility was a sink for washing with a soakaway (BALP), which was the cheapest facility on offer but does not provide an improved method for excreta management. The improved sanitation solution that was most popular was the pour-flush latrine and shower. Total investment costs accounted for 31% of household income for hard-core poor households, but the household contribution (after subsidy) was only 8% of these

households' income. The most expensive solution was the septic tank, which accounted for 59% of the poorest households' annual income but only 15% after the subsidy.

In terms of effectiveness in the use of public funds, the increased access / public funding ratio was low, as US\$1,000 was only sufficient to serve 1.6 households. On the other hand, the financing approach did not succeed in leveraging private financing, since only US\$0.13 of private funds were mobilized for each US\$1 of public funds spent.

In terms of poverty targeting, PAQPUD targeted areas with a high incidence of poverty. The same level of subsidy was offered to all within the target area for all sanitation solutions. There was some anecdotal evidence that comparatively richer households captured the subsidy, particularly for building more expensive solutions like a septic tank. Reliance on community-based organizations allowed an improvement in the targeting to some extent.

PAQPUD's financial sustainability was very low, given that public funds accounted for 89% of initial costs. As has been experienced, the program was totally dependent on external financing and it actually ground to a halt when World Bank financing was exhausted.

The approach does not appear to be scalable, given its high dependency on external funding. Serving the 70,400 outstanding demands alone would require another US\$54.5 million, which represents 514% of the sanitation budget for the entire country and 1.42% of the national budget.

WHAT SEEMS TO HAVE WORKED?

PAQPUD was successful at focusing attention on on-site sanitation, which had been neglected up to that point. In the context of the reforms of the water and sanitation sector in Senegal, the sanitation sector had received comparatively little attention and on-site sanitation had only been promoted by NGOs on a small scale. PAQPUD was therefore successful at placing on-site sanitation on the agenda for politicians, policy makers and ONAS, the para-statal agency in charge of sanitation that had previously been focused on network-based solutions. This was a significant achievement, since on-site sanitation will need to form part of the solution for Senegal to meet the sanitation MDGs. The program's

integrated approach, with attention paid to organizing the whole chain of excreta management (and building of sludge treatment facilities) was also extremely interesting.

PAQPUD offered a broad catalog of services that could meet the varied needs of the target population. The inclusion of connections to small-bore sewers improved the attractiveness of the program, since on-site sanitation was not technically possible in certain areas. Moreover, the beneficiary populations liked small-bore sewers, which they considered more attractive in an urban setting.

AND WHAT DID NOT WORK SO WELL?

The rate of hardware subsidy was increased from 50% to 75% halfway through the project, due to initial poor take-up of the facilities. The initial rate of subsidy had been defined based on a willingness to pay survey that gave an inflated picture of how much the population would be willing to pay for the facilities. Although the increase in subsidy increased take-up substantially, it also negatively affected the financial sustainability of the program, which had to stop due to lack of funds. Additional grant financing has been mobilized via GPOBA with a similar project design, but such financing has been slow to arrive and will not be sufficient to meet all the unmet demand. The gap between the end of PAQPUD's investment period (at the end of 2005) and the start of the GPOBA program means that social mobilization efforts may have been partially wasted or will need to be rekindled via additional funding. About 2,000 sanitation facilities were built in the interim with World Bank financing, but this was insufficient to sustain the previous rate of investment.

High subsidies were offered for all sanitation solutions, with limited targeting. On the one hand, 80% of the costs of gray water management solutions were subsidized. Even though demand was clearly there, one could question whether public funds should be used for building such facilities. On the other hand, high subsidies were also offered for high-cost solutions, such as septic tanks, which were only attractive to comparatively richer households. Focusing subsidies on a narrower set of sanitation solutions that help with excreta management at a reasonable cost might have been preferable.

A key stumbling block seems to be the requirement that households pay their contribution up-front, with limited possibility of spreading the costs of this contribution over time. Even though credit was made available during the second phase, it was not at the core of the program design and does not seem to have been accessed by those who would need it most. Ways of improving access to credit may need to be sought in order to increase demand for the program and ultimately reduce public fund outlays.

The approach does not seem to be scalable, unless substantial amounts of external funding are provided or the government reallocates resources to the sanitation sector. Given the competition for existing funds, a change in PAQPUD's approach may be warranted. Efficiency gains in hardware costs may be needed, since such costs appear to be high (this may even require the households to play a larger role in choosing the optimal technical solution or type of superstructure given what they can afford). Finally, social mobilization efforts could be stepped up in order to increase the acceptability of household financing and make the local population feel more responsible for investing in their own facilities rather than "wait" for the program to deliver heavily subsidized latrines. The recent deterioration in households' finances, linked to the food crisis, the increase in energy prices, and the global economic crisis, makes all of these challenges even more challenging, as households are focused on day-to-day expenses rather than making long term investments.

Annex F - Vietnam case study

Case study written by Mai Van Huyen, Cu Thuy and Sophie Trémolet

OVERVIEW OF VIETNAM CASE STUDY (THE THREE CITIES SANITATION PROJECT)

Key facts	
Project name	Three Cities Sanitation project – Sanitation Revolving Fund component
Project objectives	Provide loans to low-income households to help them construct or improve sanitation facilities (both on-site and with sewer connections)
Public financiers	World Bank, Government of Australia, Government of Finland, Government of Denmark
Scale	193,670 people served in peri-urban areas in three regions
Time frame	Program years: 2001 to date / Study period: 2001-2004
Level of service	Mostly septic tanks (also composting/urine-diverting latrines and sewer connections)
Summary of financing approach	
Software support	<ul style="list-style-type: none"> • Software support for sanitation promotion and hygiene education • Software mark-up = 10% of total costs of sanitation solution
Hardware subsidies	<ul style="list-style-type: none"> • Subsidized interest rates on loans for hardware construction • Hardware subsidy: US\$6 per household (3% of hardware costs) • Hardware subsidies = 30% of public funds
Access to credit	<ul style="list-style-type: none"> • Facilitated access to credit via Sanitation Revolving Funds is the program's core
Summary evaluation	
Impact on sustainable access	<ul style="list-style-type: none"> • Contributed to increasing coverage in target area by between 13% and 21% • All facilities appeared to be working well five years down the line
Costs	<ul style="list-style-type: none"> • Average hardware costs: US\$197 (30% of lowest quintile income) • Operating costs: US\$30 per year (6.5% of lowest quintile income):
Effectiveness in the use of public funds	<ul style="list-style-type: none"> • High leverage ratio: 20 • High “increased access/ public funding”: 117 latrines built / US\$1,000 public funds
Poverty targeting	<ul style="list-style-type: none"> • People in targeted areas have no sewer connection and are predominantly poor. • Savings and Credit group leader plays an important role in selecting group members who are eligible for a loan.
Financial sustainability	<ul style="list-style-type: none"> • Public funds = 7% of total costs of sanitation adoption (high sustainability)
Scalability	<ul style="list-style-type: none"> • Scaling-up to cover the remaining uncovered population is achievable. • Approach already scaled up through World Bank and government-led projects.

OVERVIEW OF VIETNAM CASE STUDY (THE THREE CITIES SANITATION PROJECT) CONTINUED

Some lessons learned

<p>What worked?</p>	<ul style="list-style-type: none"> • The revolving fund proved highly sustainable, as the funds were revolved several times before being transferred back to the municipalities to allocate further. • The Women’s Union, a pervasive organization throughout the country with experience in microfinance, managed the scheme initiated by the local utilities. • Lending procedures were attractive to borrowers, and the loans worked as a catalyst for the households to find additional financing and invest. • The creation of Savings and Credit groups was seen as critical to ensure repayment of the loans and regular saving contributions.
<p>What did not work so well?</p>	<ul style="list-style-type: none"> • The solutions built represent a high proportion of poor households’ income and are not affordable to the poorest, who were excluded from the scheme.

F.1 Overview of the financing approach

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, the Government of Australia, the Government of Finland and the Government of Denmark for three sub-projects in Danang City, Haiphong City and Quang Ninh Province (Halong City and Campha Town). The program benefited almost 200,000 people over the course of seven years. The average hardware costs of the sanitation facilities built was US\$197.

The SRF provided small loans (US\$145) over two years at partially subsidized rates to low-income and poor households to build septic tanks or, in fewer cases, urine diverting / composting latrines or sewer connections. The subsidized interest rate was equivalent to providing a US\$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. They acted as a catalyst for household investment, though households needed to find other sources of financing to cover their total investment costs, such as borrowing from friends and family.

The program also included a significant software support component, for sanitation promotion, the creation of Savings and Credit groups, and hygiene promotion. Software support

per household was about US\$21 and represented about 10% of the total costs of sanitation adoption.

This case study starts by providing some brief background on the country and sanitation context. We present the way in which on-site sanitation was provided through the project before analyzing the costs of such provision. We then evaluate the performance of the financing approach for the on-site solution, focusing on its impact on sustainable access to services, on costs and effectiveness in the use of public funds, and on poverty targeting, financial sustainability, and scalability. A summary section draws out key lessons learned, looking at what seems to have worked and what did not work so well.

F.2 Country and sanitation sector context

F.2.1 Country context

Vietnam, a country of 85.6 million people at the end of 2007, is the 13th most populous country in the world. Although urbanization is developing rapidly, only 27% of the population was living in cities as of 2007. In recent years, Vietnam has experienced relatively high economic growth, at approximately 7% per annum.

In 2007, GDP per capita was estimated at US\$828,⁵ although this was considerably higher when considered in PPP-adjusted terms (US\$2,589). The national poverty rate was estimated at 15% in 2007.

5 International Monetary Fund, World Economic Outlook Database, April 2009. <http://www.imf.org/external/pubs/ft/weo/2009/01/weodata/index.aspx>

F.2.2 Initiatives to increase sanitation coverage

The government's sanitation sector strategy was developed with assistance from UNDP/World Bank in 1990 and the Finnish Government in 1995/1996. Among other things, the strategy focused on decentralizing activities to the local level and, where appropriate, outsourcing service functions such as septage collection or maintenance of equipment to the private sector. At the household level, it was decided that property owners would continue to be fully responsible for on-site sanitation costs, although it was recognized that lower-income households would need assistance to build suitable sanitation facilities through access to credit. Prior to this, however, donors had tried to develop sanitation investments through heavily subsidized schemes, but by and large these had failed.

Between 2000 and 2006, access to improved drinking water and improved sanitation increased from 78.7% to 89.0% and from 44.1% to 64.3%, respectively. According to Joint Monitoring Programme (JMP) figures, 88% of the urban population in Vietnam had access to improved sanitation in 2006 and 5% had shared facilities.⁶ Urban water-supply coverage reached 97.1% in 2006.

F.2.3 Institutional set-up for urban sanitation

At the national level, the Ministry of Construction (MOC) is responsible for urban water supply, sanitation, and drainage. This includes responsibilities for planning, policy formulation, regulation, training, and technology transfer.

At the provincial level, the Provincial People's Committees (PPCs) are responsible for urban infrastructure development, including water supply, sanitation and drainage. In the “special” cities such as Ho Chi Minh City and Hanoi as well as some other large cities—such as Haiphong, Da Nang and Ba Ria Vung Tau—where there are large drainage systems, the PPCs established Sewerage and Drainage Companies (SADCOs) or Urban Drainage Companies (UDCs) for maintaining existing drainage systems and collecting and treating waste water and solid waste. In smaller cities, the PPCs have established Urban Environmental Companies (URENCOs), which are public enterprises responsible for

maintaining existing drainage systems, collecting and treating wastewater and solid waste, and other services such as street pavement maintenance, parks, street lighting, road construction, and burial services. We refer to these collectively as the “local sanitation service companies” in the rest of this case study.

F.3 Sanitation Revolving Fund project design

This section presents the overall set-up of the Sanitation Revolving Fund (SRF) component of the Three Cities sanitation project, its institutional set-up and levels of service, the total costs and sources of financing, as well as the main characteristics of the lending product.

F.3.1. Project overview

The Three Cities Sanitation Project was initiated to support the Government of Vietnam's sanitation sector strategy. The World Bank-funded Three Cities sanitation project was approved in May 1999. It officially started in January 2000 and closed in June 2008, although the Sanitation Revolving Fund component is scheduled to continue operating under a different institutional set-up until at least 2010 in some cities. The original project operated in three subprojects, in Da Nang City, Haiphong City, and Quang Ninh Province (Halong City and Campha town). A project management unit was established in each city/province.

The project as a whole aimed to make sustained improvements to public health and to increase economic development by reducing the incidence of flooding, upgrading the urban environment, and developing more efficient and financially sustainable sanitation and drainage companies. In terms of implementation, it focused on increasing decentralization by developing greater financial and governance capacity at the local level and promoting private sector participation by helping to commercialize public utility agencies.

The project included rehabilitating essential sanitation infrastructure, institutional strengthening of the local sanitation services companies, and facilitating greater private-sector participation. This was done directly by providing technical assistance for the procurement and regulation of private

⁶ These figures are disputed. Other figures, from the MOC/ Vietnam Water Supply and Sewerage Association, placed urban water supply coverage at 70% in 2006 and urban drainage coverage at about 60%.

contractors and indirectly by helping to build commercially oriented public utilities. It was expected that, by the end of the project, local governments and their sanitation service companies would be in a position to take over responsibility for an increased share of the investment costs of sanitation infrastructure. In terms of hardware, the project focused on improving primary and secondary drains, sewers, and solid waste collection, transfer and disposal.

Project components were designed in the same way in all three areas including (i) sewerage and sewage treatment; (ii) drainage; (iii) institutional development and construction management; and (iv) revolving funds for household sanitation facilities.

Revolving funds were established in selected areas in each city to provide loans to low-income households to help them construct or improve on-site sanitation facilities, mainly individual septic tanks and urine-diverting / composting latrines, or to build sewer connections. This component built on the recognition that on-site sanitation solutions should be offered to those who were located far from existing or expected sewers, because sewers and full biological treatment would not be affordable for the entire population. The sanitation service companies thereby recognized that they should provide sanitation services to all urban citizens and not only the families that are connected to their piped networks.

The revolving fund component was implemented in two distinct phases:

- *During Phase 1 (from 2001 to the end of 2004), the revolving funds were operated under the management of the Three Cities Sanitation Project* in each of the cities. After phase I of the project, funds were handed back to the People's Committees of the three cities/provinces.
- *During Phase 2 (from 2005 to date), the funds were transferred to the management of the Municipal/Provincial People's Committee.* The second phase ran from 2005 to 2008 for Halong and Campha and will extend to 2010 for Da Nang and Haiphong. In Halong and Campha, the funds are now closed and the working capital was sent back to the Provincial People's Committee. A follow-up is being considered

by the Provincial People's Committees since there is still demand from local people. The principle of continuing to use the fund beyond Phase 1 to finance other areas with a social or environmental purpose was agreed to at an early stage.

F.3.2. Revolving fund institutional set-up

In each city, the local sanitation service companies appointed the local branch of the Women's Union to administer the revolving funds on their behalf. The Women's Union has a lot of experience and is the most competent organization to deliver health education programs and manage microcredit schemes in Vietnam. It has been managing similarly funded projects since 1992. As they had been very successful in managing Phase 1, Women's Union branches were assigned to manage the revolving funds during Phase 2 as well. They received assistance from the local sanitation companies in order to develop technical solutions and supervise the quality of constructed work.

At the community level, the Revolving Funds functioned on the basis of Savings and Credit groups, formed by potential borrowers and led by a group leader. Savings and Credit groups included 12 to 20 people each who had to live close to each other in the same ward in order to ensure community control. People in the same groups had to pay back the loan on time to enable others to get a loan. Several groups could be formed in the same ward according to demand. To join a Savings and Credit group (and therefore be eligible for a loan), households had to meet the following eligibility requirements:

- Be in need of funds for construction or improvement of sanitation facilities including latrines, septic tanks, or internal plumbing;
- Have no other outstanding loan and no previous bad debt and they must be deemed able to pay back the loan;
- Be low-income, although hardcore poor⁷ were excluded because of their low ability to pay the loan back; applicants had to have an income above the provincial poverty line but less than 1.5 times that level; and
- Be willing to commit to the group's activities and rules and regulations; this would usually entail making compulsory savings of VND 10,000 to VND 20,000 per month, which cannot be withdrawn before the loan ends, and participating in monthly group meetings.

⁷ Those below the national poverty threshold of VND 150,000 per capita per month, or US\$516 per household per year in 2004

Savings and Credit Groups were led by a group leader, who had to live in the same area and be either a staff from the local Women's Union or the head of the residential block. Group leaders played a very important role to make sure that all borrowers paid back the loan and interest on the loan within the payment term. In some cases, they had to advance their own funds to those who might not be able to pay the installment. Group leaders (mostly women) were involved on a voluntary basis and would usually be motivated by pride or the desire to enhance their reputation. They were responsible for managing group activities, which included identifying eligible households to receive the loans, organizing group meetings, managing the loan repayment progress, and collecting interest as well as compulsory savings, and finally ensuring that investments were carried out within 30 days following the disbursement of a loan.

Saving and Credit groups were monitored at the ward level and at the provincial level by Revolving Fund management boards, which were themselves placed under the scrutiny of the project management units in each city. At the ward level, a three-member management board was formed and was responsible for monitoring the use of funds and supervising the groups' activities. They were also in charge of building up promotion teams and disseminating information on hygiene issues as well as reporting to the Provincial / Municipal Management Boards about the use of the loans. At the provincial level, the management boards were created with five to seven members each, who were permanent staff of the Women's Union and/or contractual staff. In addition, representatives from the local sanitation service companies and/or project management units were part of the Provincial Management Boards. Their responsibilities included monitoring the revolving funds' performance and developing materials that could be used at the ward level, such as IEC materials or bookkeeping and reporting systems.

F.3.3 Levels of service

Three potential technical solutions were offered to borrowers in all three cities: septic tanks, composting/urine-diverting latrines, and sewer connections. Composting/urine-diverting latrines were applicable mainly in the semi-urban communes of Campha and Halong cities, where nutrients from human excreta are needed for vegetable production. Latrines with septic tanks and sewer connection were highly preferable in

Haiphong and Da Nang cities, with better-off people living in urban areas with limited land for accommodation. However, the take-up of sewer connections was considerably reduced by delays in the construction of the main sewers.

CAPITAL COSTS

A detailed design was provided together with the estimated cost to every potential borrower. Borrowers decided on the technical solution that best suited their needs, depending on affordability and other considerations (such as odor and convenience).

The project provided estimated costs for these options to the households: VND 2,050,000 (US\$149, using the 2001 exchange rate) for a composting/urine-diverting latrine, and VND 3,200,000 (US\$225) for a septic tank (2001 prices). Whereas such estimates were sufficient to cover the costs of a septic tank, they represented only a bottom estimate for septic tanks, with actual costs being at least VND 3,500,000. These estimated costs were increased in 2006, partly to reflect inflation, to VND 3,500,000 (US\$218 at 2006 exchange rate) for a composting/urine-diverting latrine and VND 4,100,000 (US\$256) for a latrine with a septic tank.

For sewer connections, the costs varied substantially depending on the length of pipe required and on the type of terrain. An average estimate made by the consultants to the Three Cities Project was VND 1,310,000 (US\$95 at 2001 exchange rate) per sewer connection.

OPERATION AND MAINTENANCE COSTS

The operating cost of a toilet with septic tanks includes cleaning products, electricity, toilet paper, and water for flushing, and ranges from VND 30,000 to VND 60,000 per month in 2008. Emptying septic tanks should be done once each four or five years. It is normally charged at VND 400,000 to VND 800,000 (2008 prices) per tank depending on the accessibility and the volume of the tank.

Since 2001, the sanitation service companies have introduced a wastewater fee for all households connected to the water networks, payable through the water bill. Those households that pay that wastewater charge and have on-site sanitation facilities (rather than being connected to the sewers) can have their pits emptied at no extra charge once every five years.

The sanitation service companies have contracted out the provision of these services to private operators. As a result, the total yearly operating and maintenance costs for a latrine with septic tank (including the costs of pit emptying) were estimated to be US\$31 in 2004 prices (the end of Phase 1).

The operating costs of composting/urine-diverting latrines were smaller, at about VND 10,000 to VND 20,000 per month, mainly for toilet tissues (2008 prices). Pit emptying is done by the owners themselves for crop cultivation purposes, so there is no cost information on this. The total operating costs for that type of latrine were estimated to be US\$8 per year in 2004 prices.

We did not obtain data on the operating costs of a sewer connection.

F.3.4. Project costs and financing sources

Overall project costs. The total cost of the Three Cities Sanitation Project was US\$119.53 million, of which US\$80.50 million (67%) was from an IDA/World Bank loan with a 10-year grace period and 40 years to maturity. In addition, grants were received from the Government of Australia (Da Nang); the Government of Finland (Haiphong) and the Government of Denmark (Quang Ninh) for a total of US\$18.74 million (16%). The contribution from the Government of Vietnam was about US\$20.29 million (17%).

Revolving fund component. A total of US\$3 million was allocated to the revolving fund component (less than 3% of the total budget), of which US\$1 million was a grant from Denmark (transferred to the World Bank through a trust fund), US\$1 million a grant from Finland to Haiphong's Women's Union and US\$1 million from the World Bank project funds (transferred by the central government to the recipient cities as grants). The funds for Phase 1 were allocated as shown in Table F.1 below.

Approximately 15% of the total was allocated as operating costs and hygiene education activities for the revolving fund component (in Haiphong, there was also a contingency which corresponded to the funds made available by the City of Haiphong itself). In addition, funded out of the main project, a group of technical consultants helped the Women's Union carry out intensive hygiene education activities.

The remainder was used as working capital for the revolving fund component. Administrative expenses at the local level were funded through interest revenues on this working capital (see next section on loan design).

The total value of loans provided during Phase 1 is shown in Table F.2 below. This shows that, on average, working capital funds were "revolved" about twice.

TABLE F.1. PHASE 1 - REVOLVING FUND ALLOCATIONS (IN 2001 US\$)

	Da Nang	Haiphong	Halong	Campha	Total
Phase 1 – initial allocations					
Working capital	861,000	707,000	545,000	398,000	2,511,000
Operating costs*	152,000	151,000	85,000	64,000	452,000
Contingencies	0	151,000	0	0	151,000
Total	1,013,000	1,010,000	630,000	461,000	3,114,000

Converted using 2001 exchange rates, US\$1= VND 13,800

Note: Operating costs were split between, approximately, 5% for management and 10% for hygiene education.

TABLE F.2. TOTAL VALUE OF LOANS PROVIDED DURING PHASE 1 (IN 2001 US\$)

	Danang	Haiphong	Halong	Campha	Total
Total number of loans	12,815	8,608	7,547	6,854	35,824
Total value of loans	1,950,000	1,254,000	990,000	847,000	5,041,000
Loans/working capital	2.27	1.77	1.82	2.13	2.07

At the end of Phase 1, the working capital was returned to the Provincial People’s Committees, which re-allocated those funds to be used for Phase 2. With the effect of inflation, the value of this working capital had decreased, however. In addition, the operating costs for Phase 2 were retained out of the transferred funds, which led to an overall reduction in working capital value, as shown in Table F.3 below. In Halong and Campha, there had been savings on operating costs during Phase 1, which meant that funds transferred for Phase 2 were slightly higher.

Additional expenses were incurred by the project as a whole, such as in community participation development or hygiene awareness campaigns, but it was not possible to disaggregate such figures in order to allocate them to the revolving fund component. The estimate of the software costs (including hygiene promotion and administrative expenses) is therefore an underestimate.

F.3.5 Loan design

The Sanitation Revolving Funds (SRFs) offered two main types of loans: sanitation loans and income-generation loans, the latter for activities such as garment sewing or handmade production.⁸ Sanitation loans accounted for 80% of the number of loans provided by the SRFs, and income-generation loans were made mainly out of the funds available from compulsory savings.

The key characteristics of the sanitation loans provided by the SRFs were as follows:

- *Loan size:* The maximum amount that could be awarded to each borrower was VND 2,000,000 (US\$145 at 2001 exchange rates). This was increased to VND 3,000,000 in 2006 (US\$187 at 2006 exchange rates)

for the second phase of the project.

- *Interest:* The monthly interest rate was 0.5%, which as about half the normal commercial rate.⁹ This is equivalent to a 5.85% annualized interest rate over the life of the loan (taking into account the grace period). These interest rates were increased slightly during Phase 2.
- *Payment terms:* The loan had to be repaid over 24 months, with a 6-month grace period during which no capital repayment is due. Interest had to be paid from the first month.

Disbursement schedule: An advance payment of 20% was paid to the household borrowers on approval of the loan by the Management Board. Subsequent percentage payments were made at predefined stages of completion, based on progress certificates signed by the Women’s Union. Revenues from interest payments were used to cover administrative costs and any potential default. Those revenues were allocated as follows: 50% for administrative costs at the ward and group level; 20% for administrative costs at the provincial level; 20% for defaults; and 10% to make incentive payments and reward groups with significant achievement in loan repayment. The decision to write-off a bad debt must be approved by the Provincial Management Board, and the Savings and Credit group must pay at least half of the outstanding loan principal from its compulsory savings pool.

In addition, Savings and Credit group members had to make compulsory savings, from at least VND 10,000 to 1% of the value of the loan, which had to be paid from the first month.¹⁰ Members were not allowed to withdraw their savings before the end of the loan term and they did not earn interest on these compulsory savings, which can therefore be seen as a deposit.

TABLE F.3. PHASE 2 – REVOLVING FUND ALLOCATIONS (IN 2004 US\$)

	Da Nang	Haiphong	Halong	Campha	Total
Value of principal fund reimbursed - end of Phase 1	755,053	620,313	478,137	348,926	2,202,428
Value of principal fund brought to use in Phase 2	645,100	508,453	448,456	357,760	1,959,769
Allocated for operating costs of Phase 2	109,953	111,860	28,028	22,372	272,213
Allocated for operating costs of Phase 2 (%)	15%	18%	6%	6%	12%

8 In addition, during Phase 2, some revolving funds provided loans for water supply investments. This was not allowed during Phase 1.

9 This subsidized rate has not been taken into account into the computation of the use of public funds, as the funds were provided as a grant to the project. Estimating the value of this subsidy would require putting a value on the public cost of capital, which goes beyond the scope of this project.

10 In Haiphong, savings were not compulsory, but capital repayments equivalent to 5% of the total loan had to be returned each month from the 5th month of the cycle. They were able to offer these conditions because the population was better-off in Haiphong, which meant that the credit risk was lower.

Savings could be retained and managed by the Savings and Credit groups. Group members decided how to use savings, but in general they were used to give loans for income generation and sanitation improvements. Loan recipients who received this savings had had to prove their capability for repayment by performing well on previous sanitation loans awarded.

F.4 Evaluation of the project's performance

In this last section, we seek to evaluate the project's performance at extending household sanitation based on criteria set out in the common methodology for the project. Detailed calculations are based on Phase 1 only, as some critical data was missing for Phase 2.

F.4.1 Impact on sustainable access to services

The SRF mechanism covered 94 wards in the four cities and benefited about 200,000 people from 2001 to 2008, as shown in Table F.4 below.

Of the 46,308 sanitation facilities built with financial support from the revolving funds, 88% were septic tanks, 9% were for sewer connections, and 3% were for composting/urine-diverting latrines.

At the project design stage, it was envisaged that a higher percentage of the loans would be used to invest in sewer connections rather than septic tanks. However, the construction of the main sewers encountered some delays and did not keep up with the pace of the revolving fund component. When the main sewers eventually got built, toward the end of the Three Cities Sanitation project, the revolving funds had to be wound down and transferred to the municipalities and

households that had already invested in septic tanks, so they were reluctant to connect to the newly built sewers. This is a potential limitation of the SRF scheme, and it would have been preferable to delay it until the sewers were actually built. However, the Women's Union was keen to press on with the loan program so as to provide access where demand was high.

Improved sanitation facility coverage rates have significantly increased in all four cities.

Coverage with improved sanitation facilities varied between 15% (Campa) and 70% in Da Nang and Haiphong, prior to the project being in place. The project made a significant contribution to increasing coverage in all four cities, ranging from 13% to 21% coverage increase when compared to the baseline population in 2000. However, the percentage of coverage increase is lower when compared to the 2007 population, reflecting the population growth during the period.

Not all these achievements can be attributed to the revolving fund component alone, however. For example, it was estimated that about 20% of households invested in improving their sanitation facilities from their own resources, thanks to the overall impact on sustainable access to services, such as the hygiene promotion campaign. In Da Nang, for example, it was estimated that about 1,700 households improved their sanitation facilities following the communication campaign but without a loan from the SRF. Those improved sanitation units contributed to an increase of sanitation access coverage (including nonimproved latrines) from 83.6% in 2000 to 90.4% in 2004. In Halong, access to improved sanitation had risen to 90% by 2007, largely due to the impact of the SRF.

TABLE F.4. ACHIEVEMENTS OF THE REVOLVING FUND APPROACH (PHASES 1 & 2 - 2001-2008)

	Da Nang	Haiphong	Halong	Campa	Total
Total number of loans provided	18,516	15,532	10,978	9,863	54,889
Number of sanitation facilities built	15,368	13,855	9,581	7,504	46,308
Composting / urine-diverting latrine	0	0	411	1,031	1,442
Toilet with septic tanks	15,266	9,980	9,098	6,405	40,749
Sewer connection	102	3,875	72	68	4,117
Number of people reached with sanitation facilities	69,310	54,312	39,282	30,766	193,670
Number of loans for other purposes	3,148	1,677	1,397	2,359	8,581
% of sanitation loans out of total loans	83%	89%	87%	76%	84%

TABLE F.5. INCREASE IN COVERAGE IN PROJECT AREA (2000-2007)

	Date	Da Nang	Haiphong	Halong	Campha
Baseline population in project area	2000	543,637	419,400	186,029	154,035
Baseline coverage	2000	70%	70%	55%	15%
Baseline number of household facilities (estimated)	2000	84,378	74,893	24,955	5,635
Number of sanitation facilities built	2000-2007	15,368	13,855	9,581	7,504
Equivalent increase in coverage vs. baseline population		13%	13%	21%	20%
Increase in coverage vs. 2007 population		9%	8%	20%	19%

Other significant achievements have included the following:

- Awareness of the linkages between hygiene, sanitation, environment, and health was raised by many hygiene promotion campaigns conducted by the technical assistance subcomponents of the overall project.
- The capacity of the Women's Union staff was strengthened by many training activities conducted on credit appraisal, loan portfolio quality monitoring, and study tours to exchange experience among project sites and relevant projects in the country.

According to the Women's Union's experience, as well as focus group discussions and observations, all facilities built with revolving fund financing appear to be still operating five years down the line. This reflects strong ownership of the scheme, with the loan recipients taking good care of the facilities built out of the loan proceeds.

F.4.2 Costs

The total costs of building a septic tank latrine, including financing costs and software costs, were around US\$220, including US\$20 to US\$25 for the software component.

Taking account of the financing costs and the software costs (i.e. the operating costs of the revolving fund), we estimated that the total costs for a septic tank with latrine ranged from US\$221.7 in Haiphong to US\$214.4 in Campha in 2004 prices. The software component (the operating costs of the SRF) represented between 8% and 11% of the total costs for a septic tank.

A composting/urine-diverting latrine was comparatively cheaper, at around US\$150, including US\$17 to US\$19 for the software component (13% of total costs)

Despite this cost difference, borrowers had a strong preference for building septic tank latrines. In the two larger cities, Danang and Haiphong, all loans were used to build a septic tank, reflecting the fact that these two cities are more urban in nature (hence there is no need for compost for agricultural production) and that the population is comparatively better off.

Operating costs of the septic tank latrine were also higher, at about US\$30 per year (in 2004 prices), compared to US\$8 per year for a composting urine-diverting latrine.

However, after 2001, services for emptying septic tanks were offered free of charge to those who were connected to the water system, as this cost would be covered through the wastewater charge. This amounts to a savings of US\$6 on operating costs, although households still needed to pay this service indirectly through the wastewater charge.

For households, the loans helped spread the burden of the investment costs over time, but the investment still represented a substantial portion of low-income households' income.

Given the choice of technical specification (a latrine connected to a septic tank, which was not at the bottom of the sanitation ladder), the investment costs for households (including hardware and financial costs of the loan) represented a sizeable portion of their annual income. For a composting/urine-diverting latrine, it ranged from 22% for a low-income household to 30% of yearly income for a poor household. For a septic tank, household investment ranged from 24% for a low-income household in Da Nang to 46% for a poor household in Haiphong, as seen in Table F.6 below. Despite this apparent burden, low-income households were still prepared to make substantial investments in improved sanitation.

TABLE F.6. HOUSEHOLD INVESTMENT COMPARED TO HOUSEHOLD INCOME

Composting / urine-diverting latrine	Danang	Haiphong	Halong	Campha
Household investment as % of average income	n.a.	n.a.	7	7
Household investment as % of low income	n.a.	n.a.	22	22
Household investment as % of poor income	n.a.	n.a.	30	30
Latrine with septic tank				
Household investment as % of average income	9	13	10	10
Household investment as % of low income	24	38	32	32
Household investment as % of poor income	40	46	44	44

Note: Information on the percentage of income for an average income household are provided as a basis for comparison, as average households were not a target group for the program.

The total outgoings on a sanitation loan (including the compulsory savings, which are only recouped once the loan has been repaid) amounted to VND 2,385,000 or US\$142 (at the 2004 exchange rate). This represented about 30% of the yearly income of a poor household, defined as being below the national poverty threshold (i.e. a monthly income of VND 150,000 per capita for the period 2001-2004). For low-income households (below a threshold defined by each municipality, slightly higher than the national poverty threshold), the cost of the sanitation loan represented between 18% and 28% of their yearly income depending on the city.

Operation and maintenance costs of a composting / urine-diverting latrine were relatively affordable, ranging from 1.6% of an average household income to 7% of a poor household income. In addition, compost from the latrine could be used for agriculture purposes and therefore generate revenues.

The costs of maintaining a septic tank were also relatively affordable, ranging from 1.3% of an average household income in Da Nang to 6.5% for a poor household. In addition, the fact that emptying septic tanks is provided as a free service by municipalities (and financed through the wastewater charge) can reduce the financial burden of maintaining a septic tank further.

F.4.3 Effectiveness in the use of public funds

From the public-sector point of view, the “bang-for the buck” ratio was particularly high, as US\$1,000 of public funding enabled the construction of septic tanks for 116 households.

This reflects the fact that the type of investment retained was relatively low-cost and, most importantly, that the use of public funds was rather limited, with most of the investments financed by households themselves.

Investments in sanitation facilities have overwhelmingly been financed by the household themselves with prefinancing from the revolving fund.

We sought to estimate the value of household investments, based on the average costs for each technical solution.¹¹ The loans provided by the SRF covered approximately 98% of the hardware costs for a composting/urine-diverting latrine and 65% of the average hardware costs of a septic tank. Taking into account that households had to cover interest costs (which partly paid for administrative expenses), we estimated that households had invested close to US\$5.2 million during Phase 1 alone in septic tanks and urine-diverting /composting latrine.¹² This is likely to be an underestimate, however.

Although SRF loans did not cover 100% of total investment costs, demand for the loans was very high and the loans served to catalyze other sources of funding.

11 This was done only for septic tanks and urine-diverting/composting latrines, since the focus of the project was on on-site sanitation solutions. Besides, sewer connection costs varied substantially from one household to another.

12 The information for Phase 2 was incomplete so we only carried out detailed calculations for Phase 1.

Loan recipients indicated that they often borrowed additional funds from other sources such as friends, brothers/sisters, or even from other funds managed by the Women’s Unions to build an adequate latrine, because they did not want to have to upgrade it in the near future. For example, during Phase 2, it was found that some borrowers built combined bathrooms and toilets for a total cost of VND 30,000,000 (10 times the size of the loan). Those were people with comparatively high incomes in cities such as Haiphong and Halong, however. In addition, it was estimated that about 30% of households within the project area asked for a loan for sanitation improvement but could not obtain one because funds were limited.

The repayment rates have been very high in all cities, with 99.63% and 99.8% in Da Nang and Haiphong, respectively, and 100% in both Halong and Campha during Phase 1. Compulsory savings set aside by borrowers have also made it possible to grant a total of 8,581 loans for income-generation, which contributed to reducing poverty in the cities. The leverage ratio (i.e. the amount of private investment generated by US\$1 of public investment) for the revolving fund mechanism was extremely high, ranging from 13.4 for investment in septic tanks in Haiphong to 25.3 for septic tanks in Campha (where operating costs were kept to a minimum). These are shown in Table F.7 below.

TABLE F.7. LEVERAGE EFFECT (\$ INVESTED PRIVATELY / \$ PUBLIC MONEY SPENT)

	Da Nang	Haiphong	Halong	Campha
Composting / urine-diverting latrine	n.a.	n.a.	14.1	17.1
Septic tank	19.8	13.4	20.9	25.3

TABLE F.8. DISTRIBUTION OF LOAN RECIPIENTS BY INCOME BRACKET

	Da Nang	Haiphong	Halong	Campha
Definition of poor household (provincial level)				
Monthly income per capita <	250,000	180,000	250,000	150,000
Definition of low income household				
Monthly income per capita <	275,000	270,000	275,000	225,000
% recipients defined as poor household	31%	100%	40%	15%
% recipients defined as low income households	69%	100%	60%	85%

The public funds used were calculated based on the operating costs set aside for the revolving fund. The costs of project preparation for the Three Cities Project, as well as overall operating expenses of the overall project, should in theory be included in the estimation of operating costs, but these expenses could not reliably be attributed to the revolving fund component and have therefore been excluded. Funds made available as working capital were not “used” as such, since they were fully repaid and interest revenues covered administrative expenses and the risk of default.

Finally, another “use of public funds” can be associated with the fact that the interest rate on the loans was partially subsidized, as it was about half the commercial rate with a six-month grace period. We have not estimated the value of this subsidy, as this would depend on the opportunity cost of capital for public entities (rather than on the commercial interest rate), a piece of information that was not available to us and would require further analysis to obtain.

F.4.4 Poverty targeting

The revolving funds targeted poor households living in areas not connected to the sewers

Women Unions kept information on the incomes of the loan recipients, as shown in Table F.8 below. The definition of low-income and poor households varied from city to city, depending on their relative wealth.

All households who benefited from the loans were in the first (i.e. the lowest) income quintile according to the local definitions. The majority of loan recipients were defined as low-income households based on city-level definitions of poverty, whereas a smaller percentage loans went to those who are defined as poor based on the provincial definition.

Errors of inclusion were close to nil.

Rich people did not benefit from the scheme, as they would have already had very good facilities and funds were limited compared to demand. The error of inclusion was therefore limited to an absolute minimum via the control of the Savings and Credit group leaders.

Very poor households did not have access to the loans due to their limited ability to pay it back.

The very poorest (i.e. those with an income below the national poverty line of VND 150,000) did not have access to the loans because of their assumed low ability to pay it back. Although this is a potential limitation of the program, its impact was limited. Given that the cities where the program was run were comparatively richer than the small towns, the percentage of people falling below the national poverty line was very small (2.41% of households in Da Nang, 3.21% in Haiphong, 7.97% in Quang Ninh for example). In addition, other government programs, including free housing, were available for those under the national poverty line.

During the design stage of the program, it had originally been contemplated to offer several types of loan products (with varying levels of subsidization) to tackle the needs of different income groups. However, the Women Union's advised against this segmentation, based on their experience, as they indicated that offering highly subsidized loans would dampen the demand for less subsidized ones. The other alternative that was contemplated was to revolve the funds up to the point where all existing demand for the loans had been exhausted and to then use the remaining working capital to provide hardware subsidies to the poorest households, i.e. those who were not able to access a loan. However, the revolving funds are still functioning as there is still untapped demand for loans so it is not possible to assess the validity of such an approach.

F.4.4 Financial sustainability

All costs (except operating costs) were recovered from households via the loan, pointing to a high financial sustainability.

As discussed in Section F.3.4 above, the working capital was revolved about twice during Phase 1 and provided a basis for further loans during Phase 2. Operating costs which were not covered by interest revenues (and which can therefore be seen as a software contribution) represented about 16% of the cost of a septic tank and between 9 and 11% of the costs of a composting/urine-diverting latrine.

Most operating costs were covered by households themselves, except the costs of emptying septic tanks, which were covered via the wastewater charge.

We did not have sufficient data to assess whether the wastewater charge was indeed sufficient to cover the real costs of emptying septic tanks, and whether or not a cross-subsidy is at play here. However, given the logic of the overall set-up and the move towards commercialization of the sanitation companies, cost-recovery of operating costs is likely to be very high, close to 100%.

F.4.5 Scalability

Scaling-up the approach seems affordable compared to the government's budget.

On average, extending coverage via septic tanks consumed about US\$20 (in 2004 prices) of public funds per household, i.e. to pay for the operating costs of the revolving fund that were not covered via interest revenues. If the remaining approximately 12% of Vietnam's urban population which currently does not have access to improved sanitation (i.e., 3.2 million people in 2005) were to gain access via this approach, this would cost about US\$15 million, which is 1.8 times the government's estimated annual budget on sanitation and seems affordable.¹³ In order to reach the very poor who are not deemed able to repay such loan, however, it may be necessary to define alternative lending schemes, with a higher level of subsidized interest rate.

¹³ This estimate is very difficult to obtain given the decentralized nature of the sanitation sector. This is based on an estimate that the government budget covers only 4% of the annual investment needs to meet the MDGs at the national level, estimated to be US\$221 million annually according to government statistics.

The approach has been scaled up through a variety of projects and government-led initiatives.

The SRF was replicated through a variety of projects, including on-going projects funded by the World Bank. For example, the Coastal Cities Environmental Sanitation Project (CCESP), which is ongoing and scheduled to end in 2014, has a sanitation revolving fund component managed by the Women's Union. The loan terms are similar to those of the Three Cities Sanitation Project, but about twice the size. Similarly, the Vietnam Urban Upgrading Project (VUUP) has a revolving fund component for housing improvements, with an average loan amount of US\$390. According to the Project Appraisal Document for this project, the repayment requirements represent 10-25% of average monthly household income in typical project areas, which is within the limit considered affordable for low-income households. The total working capital for microcredit in World Bank projects was estimated to be about US\$25 million as of March 2009, and all existing funds are performing very well.

It is reported that the Vietnam Bank for Social Policy, established in 2003, has also adopted this kind of approach for household improvement and water and sanitation loans throughout the country, with impressive results.

F.5 Summary evaluation

In this section, we summarize the evaluation of the financing approach based on our set of criteria and review what seems to have worked, and what did not work so well. Overall, the Sanitation Revolving Funds (SRFs) achieved great impact, both in raising sanitation and hygiene awareness and sanitation facility improvement.

In terms of impact on sustainable access to services, the SRF component of the Three Cities Sanitation project delivered substantial investment, as it helped almost 200,000 households build sanitation facilities over the course of seven years. This resulted in increases in coverage of about 13% to 21% when compared to the baseline population. According to the Women's Unions, all facilities seemed to be working well five years down the line and septic tanks were emptied on a regular basis thanks to services provided by the local utilities (in exchange for payment of the wastewater charge by those households connected to piped water supply).

In cost terms, the SRF supported investment that represented a relatively high percentage of household income but was still seen as affordable. The average total cost of a septic tank built with financial assistance from the SRF was US\$220, of which only 9% were software costs. From the point of view of the households themselves, the required investment represented about 30% of their annual income for low-income households and up to 46% for poor households. Despite this relatively high burden, they were still willing to invest substantially (from their own funds and other sources of finance) and there is still significant unmet demand for the loans.

In terms of effectiveness in the use of public funds, returns to public fund investments were particularly high since US\$1,000 of public funds used enabled the construction of septic tanks for 116 households. The revolving fund mechanism allowed minimizing the use of public funds while leveraging household investment by a factor of up to 25 times the amount of public funds spent on the project.

In terms of poverty targeting, the SRF targeted poor households not connected to the sewers. The SRF offered loans to households within the first income quintile, i.e. the poorest quintile. The possibility of offering a higher level of subsidized interest rate to the poorest households (those who were not offered a loan due to their perceived low ability to pay it back) was dismissed at project design stage as it may have affected the effectiveness of the main loan product and other types of support could be provided to very poor households via government programs.

The SRF was highly financially sustainable, since 93% of the initial costs were financed by households themselves (via the loans). The seed funds initially provided were revolved several times (more than twice in the first phase and more during the subsequent ones), with minimum leakage in order to cover the operating costs of the scheme. Repayment rates were extremely high (at or close to 100%). In addition, the scheme has generated revenues to provide loans for income-generation activities, contributing to reducing poverty in the project area.

In terms of scalability, the approach appeared to be highly scalable. A dwindling number of Vietnamese households did not have access to sanitation. Extending sanitation services to them via the SRF approach would cost about US\$15 million, which was 1.8 times the government's annual budget on sanitation. The approach has already been successfully scaled up via World Bank-funded projects (with working capital of US\$25 million as of March 2009 in a variety of programs) and by government institutions, such as the Vietnam Bank for Social Policies.

WHAT SEEMS TO HAVE WORKED?

The revolving fund approach has proved to be a highly effective approach to financing household sanitation for the poor. Critical factors for this success were as follows:

- *Demand for sanitation investment was generated through extensive hygiene promotion programs carried out at the level of a whole province*, rather than being focused on the areas where the SRF was operating. These programs sought to increase awareness of health and environmental benefits from sanitation and to encourage communities to extend coverage and improve the quality of septic tanks through the sanitation subloans. They were funded in part from the World Bank loan although it was not possible to obtain a breakdown of such project costs.
- *Lending procedures were attractive to borrowers*, although the loan size was lower than the actual investment cost. The interest rate was attractive, as it was 50% lower than commercial bank rates. The loans helped to spread the investment costs over a period of two years and were instrumental for catalyzing other sources of funding.

- *The size of the loan was adequate*, given that all loans were recovered and the leverage effect was high. If the loan size had been too low, the leverage factor would not have been as significant. Had the cap been too high, there might have been some defaults on the loans.
- *The formation of Savings and Credit groups was seen as critical* to ensure repayment of the loans and regular saving contributions. The role of the Women's Unions in organizing these groups was particularly valuable. They are a well organized and well entrenched organization, with local branches in all wards and considerable experience at managing such microfinance initiatives. Support structures (including the Savings and Credit group leaders, who played a critical role) provided mentoring, monitoring, and guidance with the selection of target group for loan disbursement

AND WHAT DID NOT WORK SO WELL?

Although the scheme is deemed financially sustainable and scalable, its ability to target the poorest people, who are the ones likely to remain unserved as coverage grows, is questionable. Investment costs represent a high percentage of their income (around 45% for the poorest people, i.e. below the national poverty line) which may be unaffordable, even with a subsidized loan. To reach the remaining 3.2 million people without improved sanitation in urban areas, the approach may need to be adapted either with a higher subsidy built into the interest rate or perhaps with a small hardware subsidy.

Annex G – On-site sanitation at household level: A primer

This Annex presents basic information on on-site sanitation at the household level, which supported the development of the methodological framework underlying the study.¹ It includes:

- A typology of on-site sanitation solutions, which is intended to be a quick guide to on-site sanitation for readers not familiar with the sector;
- An assessment of the types of costs associated with the main on-site sanitation solutions presented here, including capital expenditure, operating and maintenance costs and software costs; and
- A typology of the sources of funds for on-site sanitation.

G.1 Types of on-site sanitation interventions

Sanitation interventions can take various forms, depending on the type of technical solution that is provided (the “hardware”) and on the support activities that are carried out to promote the uptake of sanitation solutions by communities and their sustainable use over the long-term (the “software”).

Levels of service

A commonly used concept is that of the *sanitation ladder*, which represents a menu of sanitation solutions that are supposed to deliver incremental levels of service, with corresponding increases in costs. On-site solutions, where facilities are not connected to the municipal or community sewers, are usually considered to be the “first rungs” on the sanitation ladder, because they are relatively simple to install and generally cheap. They are likely to remain the most prevalent and accessible solution for years to come in many regions in a large number of developing countries, even though sewerage networks may also need to be built, particularly in dense urban environments with high water use.

There is a broad range of on-site sanitation solutions available, as presented below:²

- *Simple pit latrine*. This is the most common type of technology, as it is simple and quick to build. It usually consists of a pit (at least 2 meters deep, which can be lined on part of the walls), a slab (with lid) and a superstructure, which can be made of various materials, such as wood, mud and grass or brick and mortar, depending on local material available. The slab can be made from concrete or wood, or from a prefabricated plastic material (which is much lighter and cheaper to transport). A variation of the simple pit latrine which employs an “ecological” approach is the Arborloo. These are constructed with simple, often unlined pits. When the latrine is full, the superstructure has to be moved and the site of the pit is used to plant a crop-bearing tree so as to make use, at least in part, of the nutrients available in the pit waste.
- *Ventilated improved pit latrines (VIP)*. This is an improvement on the simple pit latrine, consisting of adding a vent pipe covered with a gauze mesh or fly-proof netting in order to remove smell and prevent flies entering the pit from flying away. This is a more expensive solution (mostly due to the addition of a PVC pipe) and more difficult to build, as the design is often not fully understood. The interior of the latrine must be kept dark, which makes it less acceptable by local populations and more difficult to use, particularly for children and the elderly.
- *Pour-flush or flush latrine*. These latrines rely on water to act as a hygienic seal and to help remove excreta to a wet or dry disposal system. They require access to a source of water nearby and are more

1 This Annex is based on the methodological note that was prepared at the start of the study in order to define the overall methodological framework for the study and helped the local consultants familiarize themselves with the sector.

2 Each of these “access” solutions would have an associated method for downstream waste management, such as burial in-situ, manual desludging (for compost / eco latrines), mechanical removal and disposal or transfer to a sewer. These are considered in the costs of operating each access solution rather than in their own right.

expensive to build than pit latrines as a sealed pan and piping to the pit must be added. A variation on this approach is the twin-pit pour-flush latrine (pioneered in India), which has two offset pits, linked by a short plastic pipe. When one pit fills, the second is brought into use. In the meantime, the first pit can be safely emptied after its contents are left inert for a year to be brought back into operation when the second one fills up.

- **Latrine connected to a septic tank.**³ A septic tank is designed to collect and treat toilet wastewater and gray water and disperse it through a drain field into the surrounding soil. Such a solution is used when the volume of wastewater produced is too large for disposal in pit latrines and when water-borne sewerage is uneconomic or unaffordable. They are best suited for single households, schools, or health centers. All septic tanks require a system for removing the sludge and disposing of it hygienically.
- **Composting / urine-diverting latrine:** Various types of latrines have been designed to separate urine and feces in such a way that either or both can be re-used. These are based on ecological sanitation principles, which consist of recycling nutrients from human excreta for agricultural production. This requires separating feces from urine through the use of a special slab and in some cases, the addition of ash, carbon, or sawdust to the content of the latrine.

In the context of publicly funded programs or projects, additional fixtures may be added to the on-site sanitation solution such as a shower or a sink provided as a “package” together with the latrine. Although these are not “sanitation” solutions in the narrow sense used in this study (i.e. they cannot be used to manage human excreta in a safe and sustainable manner), they can be useful to improve general hygiene levels and can be a trigger for demand for the sanitation unit. All these elements taken together are referred to as the “level of service”.

The cases reviewed as part of this study included a broad range of levels of service, ranging from simple pit latrines in Bangladesh to a full sanitation unit (including septic tank,

BOX G.1 – “IMPROVED ACCESS” TO SANITATION BY THE JMP DEFINITION

The Joint Monitoring Programme (run by WHO and UNICEF) is the internationally accepted source of information on access to water and sanitation services in developing countries and used as a key source for measuring progress towards the Millennium Development Goals (MDGs). The JMP distinguishes between “improved” and “not improved” sanitation solutions. An improved facility is defined as a facility constructed in such a way that it hygienically separates human excreta from human contact. For evaluating progress towards the MDGs, users of an improved toilet facility are considered to have access to sanitation, while those using a facility defined as “not improved” or having no facility at all are considered not to have access to sanitation.

Improved sanitation facilities	Not improved sanitation facilities
Simple pit latrine with slab	Public or shared latrine
Composting toilet	Open pit latrine
Flush or pour-flush latrine	Bucket latrines
Ventilated improved pit latrine	No facilities
Connection to a septic system	
Connection to a public sewer	

Source: <http://www.wssinfo.org>

sink and shower) in Ecuador. In almost all cases, the level of service provided qualifies as “improved access” by the JMP (Joint Monitoring Programme) definition (see Box G.1 below). In Bangladesh, however, some of the latrines built by households are simple basic latrines or shared latrines and do not qualify as “improved sanitation” by the JMP definition.

Software support associated with hardware solutions
 Besides construction of the sanitation infrastructure, it is usually necessary to conduct additional activities in order to stimulate demand for sanitation or organize community mobilization.

³ Some latrines connected to a cesspit or soakaway are sometimes wrongly referred to as a being connected to a septic tank. The key difference between those solutions is that septic tanks treat sewage whereas cesspits are only used to store it. Septic tanks require more careful and therefore more expensive maintenance but are more effective in stemming contamination.

These additional interventions may consist of the following:

- Training of local staff for project management or all activities below;
- Community mobilization, i.e. activities that help communities get together and manage part or total-ity of sanitation services;
- Sanitation promotion,⁴ i.e. activities that help create or reveal latent demand for sanitation, e.g. total sani-tation approach, sanitation marketing, etc;
- Hygiene promotion, i.e. activities that promote changes in key hygiene behavior to maximize health benefits of water and sanitation facilities. Such “key hygiene behaviors” can be placed into three groups: hand washing with soap at critical moments, prop-er management of child excreta, proper storage of household drinking water.

In addition, program management activities, such as program staff, procurement, monitoring and evaluation, and general overhead need to be carried out in order to ensure the success, sustainability and replicability of any sanitation project or program.

G.2 Costs of on-site sanitation interventions

Sanitation interventions generate a series of costs related to the “hardware” (i.e. the technical solution), including invest-ment costs and operating and maintenance costs. The associ-ated software costs must also be taken into consideration to generate a comprehensive estimate of the unit costs of provid-ing access to sanitation under a given project or program. All too often, the “software” costs are not properly taken into account, which means that a project or program runs the risk of failure once the source of finance for those software costs is interrupted. Table G.1 below outlines the type of costs that may be considered for the main types of service levels.

As a rule of thumb, the higher the technical standard, the higher the level of service and benefits and the more costly the sanitation solution is likely to be. Building low-cost solutions with simple materials may in some case be a “false economy” as the latrines will simply not last as long as higher cost solutions with more permanent materials. As a result, over the long run the poor often have to pay more for their sanitation solutions than the better off.

TABLE G.1. COSTS ASSOCIATED WITH ON-SITE SANITATION SOLUTIONS

On-site sanitation	Capital costs (capex)	O&M	Direct software ⁵
Simple pit latrine	Pit digging and lining, slab, superstructure Manual labor	Emptying services Minimal maintenance	• Capacity building • Community mobilization • Sanitation promotion
Ventilated improved pit latrine (VIP)	Pit digging and lining, slab, superstructure, vent pipe Manual and skilled labor	Emptying services Minimal maintenance	• Demand creation • Sanitation marking • Training of mason
Pour-flush or flush latrine	Pit digging and lining, slab, superstructure Access to water Manual and skilled labor	Emptying services Minimal maintenance Cost of water use	• Management costs
Latrine connected to a septic tank	Excavation, foundations and superstructure, septic tank and soakage pit, PVC pipes Access to water Manual and skilled labor	Regular emptying and maintenance	

⁴ These activities are not always conducted as part of an on-site sanitation project and they may be conducted separately.

⁵ To the extent possible, the costs of strengthening the “enabling environment” need to be taken into consideration as well: these can include expenditures linked to sanitation specific policy development, capacity building, knowledge sharing or coordination. However, it is usually difficult to estimate those costs other than by taking a percentage of overhead costs for staff working on policy development at sector level, either within the government or within donors.

Comparing costs from one country to the next is complicated by differences in purchasing power parity, exchange rates, input prices, transport costs, design features, and so on. As a result, straight cost comparisons across countries may be misleading and should only be considered as indicative. Ratios which are independent of the exchange rates, such as leverage ratios or costs as percentage of income, can be more meaningful for cross-country comparisons.

In addition, a number of complex factors can impact the relative magnitude of such costs, and in particular the balance between capital expenditure (Capex) and operating expenditure (Opex). For example, for pit latrines, a key factor to consider is the size of the pit. A larger pit is more expensive to build but reduces the need for regular pit emptying (higher Capex, lower Opex).

A key difference between urban and rural settings is that in low-density areas (typically rural areas), it is possible to build larger latrines (i.e. excavating a larger pit) so that they fill up over a longer period. When full, the latrine can be moved to another site, which would generate additional capital costs.⁶

By contrast, in high-density areas (typically peri-urban and urban areas), space is a rare commodity. There is a limit to how large a pit can be and the latrine needs to be emptied on a regular basis to ensure safe sanitation. To ensure that such latrines provide sustainable and safe access, the following components should be present:

- Pit emptying services should be available and affordable. The “low-cost” alternatives, i.e. self-emptying or manual emptying, may be adequate if the latrines have twin pits and the sludge is left to rest for at least year before being emptied. However, they may also create more health hazards for the community as a whole. Pit emptying services may be provided by the local private sector, which would need to use specific equipment for accessing poor areas that are usually more difficult to reach (for example, the streets may not be wide enough to allow a standard sludge removal truck).

- Facilities to safely dispose of the sludge once collected should be available. Such facilities would need to be built and maintained by the public agency in charge of sanitation. Public agencies may have to pay to get householders / pit emptiers to dispose of the sludge in the proper facility once it is built, rather than dispose of it in the nearest drainage pipe.

Another critical factor is the cost of transporting the specialized equipment to the site, such as the slab (in the case of a simple pit latrine) or the vent pipe (for a VIP latrine). Such transport costs can be particularly significant in rural areas with low population density. These costs can negatively affect the profitability of local businesses installing latrines, especially if the population is too dispersed to develop a sustainable client base and transport is costly and time-consuming.

The software costs vary depending on the acceptability of the sanitation solution that is proposed. The intensity of software activities to be conducted would depend on prevalent hygiene practices in the region or country and the extent to which the proposed technical solution can be easily related to existing practices.

G.3 Financing sources for on-site sanitation

Funds for on-site household sanitation can come from households, government funds from tax proceeds, or transfers from external sources, as shown in Table G.2 below.

For on-site sanitation facilities, households are usually a main source of investment. Most households rely on small scale providers, such as local masons or pit emptiers, to build latrines and dispose of the waste. However, many of the sanitation facilities that are constructed in that way do not meet any public health or environment standards. They may even not be adequate to protect households' health.

Public-sector support may be needed to change incentives and improve the services on offer, or to create incentives for proper disposal of pit waste in urban areas. Public

⁶ When subsidies are provided for the first latrine to be built, it is not always the case that subsidies are provided for moving the latrine a few years down the line. If the household cannot afford moving the latrine, it may lose access to a sustainable sanitation solution that they had obtained through a publicly funded project.

TABLE G.2. FINANCING SOURCES AND APPROACHES FOR ON-SITE SANITATION

Source of funds	Example of financing approaches for on-site sanitation solutions
Households	<ul style="list-style-type: none"> • Households invest in their own facilities and pay directly for operating and maintenance costs
Government funds	<ul style="list-style-type: none"> • Public subsidy for hardware and / or software • Subsidized credit to households for investment in their own facilities • Subsidized loans to service providers (public or private) • Community-level rewards (e.g. grants to local government)
Transfers from external sources (NGOs, INGOs, philanthropic organizations)	<ul style="list-style-type: none"> • Grants to government (central or local) • Grants directly to households or service providers (e.g. OBA) • Subsidized credit to government, households or service providers

interventions may also be needed to create the right environment for small providers to develop and grow their businesses. Going back to first principles, potential reasons for the government to provide financial support for the adoption of on-site sanitation may include the following:

- **Lack of information (or information asymmetry).** For cultural reasons, demand for sanitation may be limited and households may not fully understand the positive impact they may gain from improved sanitation, particularly on their health. As a result, they may not be willing to invest in sanitation, which is a concern from society’s point of view given the positive externalities from sanitation (see next point).
- **Lifting the affordability constraint.** Sanitation investments at household level may simply be too costly for the poor, so they would either do without or build low-cost solutions that may not provide improved sanitation and / or would be expensive to maintain in a serviceable condition.
- **Positive externalities from sanitation.** Sanitation investments have a positive external effect on the general health of the population (by reducing the prevalence of diarrheal diseases and epidemics) and on the environment. For example, local residents might benefit from an increase in access to sanitation by their neighbors even if they are not connected themselves, as such an increase would help in stemming the spread of epidemics. Subsidies can be used to encourage investment beyond the level that would be done based solely on private benefits.

These reasons are not necessarily made explicit in public policy making, however, and actual interventions may have more to do with local politics than with such economic rationales. It is useful to keep such principles at the back of one’s mind when designing public support schemes for sanitation, however. For example, if lack of information is the main hurdle preventing sanitation adoption, a program emphasizing software support may be the most effective use of public funds. If there are positive externalities from safe sludge disposal (which is usually the case), public support may be needed to encourage safe removal and disposal of the sludge when latrines fill up.

Annex H - Standard terms of reference for case studies

The case studies were prepared by consultants on the ground based on standard Terms of Reference for all six countries so as to produce comparable results across countries. In addition, the consultants were provided with a spreadsheet to facilitate data collection in a comparable manner. The consultants had an average of 6 weeks to prepare the case studies, although the time allocation varied depending on the availability of information and the need for additional field work.

The Scope of Work section of the standard Terms of Reference is presented in this Annex for reference.

[A] Country and sanitation policy overview

The first section should provide an introduction to current sanitation policies in the country and in the town or region of interest within that country. It should address the following topics:

- Access to sanitation in urban and rural areas:
 - Current coverage and trends: has coverage been increasing / decreasing? In qualitative terms, what has been the main driving force behind coverage increases (if any)?
 - How far is the country from meeting the MDGs for sanitation and what efforts have been

undertaken (at a national or local level in the project area) to meet the MDGs?

- What initiatives have been undertaken to increase coverage? How does the program/project under review fit within broader policies to increase coverage?
- Institutional set-up for sanitation:
 - Which institution (s) is responsible for supervision (i.e. ensuring that the service is delivered)?
 - Which institution (s) is responsible for delivering services?
 - Which institution (s) is responsible for monitoring that services are effectively delivered?

[B] Program (or project) design⁷

This section should provide a comprehensive presentation of the program (or project) objectives and design, as well as the characteristics of the targeted area and population. When this information is not known or not available, this should be stated explicitly and ways of obtaining this indicator or deriving a proxy for this indicator should be set out in the draft report.

Program overview

- Overall introduction to the program: start date and end date (if applicable), lead institution and institutional arrangements
- Objectives and overall scope of the program
 - o Is it solely focused on sanitation elements or broader (i.e. it could be water and sanitation, slum improvement program, sanitation and solid waste removal, rural development program etc...)
 - Program approach: is the program providing a total sanitation solution or focusing on certain elements (i.e. only access, or also collection and treatment)?
 - Total program budget, % of funds allocated to sanitation
- Information on the program area
 - Geographical scope and number of households targeted / reached
 - o Population density in the program area
 - Average income of population in the program area
- Type of service provided through the program

⁷ As we can be referring to programs or projects, for convenience, the word “program” is used in what follows to refer to either a program or a project.

Program institutional set-up	<ul style="list-style-type: none"> • Has the program been established by donors or by the government? • Has a program management unit been set-up? • Which institution is in charge of channeling funds to the recipients and how are flows of funds organized? • At what level is the project managed (donor/national government/local government/ utility/ NGO)? • Which organizations are in charge of providing services (government / utility / private providers / NGOs)? • At what level does monitoring and supervision take place (donor/national government/local government/ utility)?
Total Costs of sanitation components (total at program level)	<ul style="list-style-type: none"> • Hardware: capital investments and operating costs • Software (include total project supervision costs and technical assistance) <p>Note: the accompanying spreadsheet provides details of the types of costs to be included in each category. As these are the total costs, they should include the contributions from all sources of finance (including households). If limited data is available, this should be noted</p>
Sources of finance	<p>Give the shares of financing from each the following source, indicating which cost components they are providing finance for (for example, is it for capital costs or operating costs and for which component):</p> <ul style="list-style-type: none"> • Household finance (initial investment made by the household or via the payment of a tariff payment or a tax) • Private sector financing (for example, if the private sector has invested in initial infrastructure and getting its investment back through charges) • Domestic public sector financing: loans/ grants (indicate whether financing is coming from local / regional / central government) • Donor financing: grants / loans (for a loan, indicate the financing terms) <p>From a qualitative point of view:</p> <ul style="list-style-type: none"> • Why are households investing (or not)? Were they investing before or have they started investing in response to the program? What are non-financial constraints to household investment? • Have any incentives / guarantees been offered to the private sector to encourage them to invest? Have these been sufficient to trigger such a response?
Pro-poor focus in project design	<ul style="list-style-type: none"> • Did the program specifically seek to target the poor or was it designed to reach everybody, irrespective of income? • Has any poverty mapping exercise been carried out before implementing the program? • Has any willingness-to-pay study been carried out and how have the results been incorporated in the design of the program?
Subsidy design	<p>If subsidies are provided:</p> <ul style="list-style-type: none"> • Who is the subsidy awarded to: household, service provider? • Is the subsidy provided in kind or in cash? If in kind, what is provided? • What are the cost components covered by the subsidy? • Is the subsidy for a basic level of service? Who pays the complement if a higher level of service is sought? • What are the criteria and procedure to follow to obtain a subsidy? Do the criteria aim to target the poor in particular?

C. Evaluation of the program's performance

This section will seek to evaluate the program's performance on the basis of a number of indicators, which have been standardized in order to facilitate comparisons from one

case study to another. Each of the main questions (in the blue box) should be answered in both a qualitative and quantitative manner (with information on as many indicators that follow as possible for the quantitative part).

Efficacy (did the financing approach trigger investment?)

- Total number of sanitation facilities built (e.g. latrine, sewer connection, etc... - it will be necessary to state these figures by type of sanitation facility built)
- Number of people receiving "adequate" sanitation services as a result of the program
- Number of villages having achieved "Open Defecation Free" status (if applicable)
- Percentage of sanitation facilities built that are still operating 5 years down the line (if the program does not have sufficient history, indicate the percentage of facilities deemed to still be in operation at the present time)
- Indicators of household satisfaction: are they using the facilities and are they satisfied that they have improved their existence?

Efficiency (was investment carried out at a reasonable cost?)

- Average total costs / household served by the project / program
- Average total costs / households in the served community (even if the household itself is not served, in order to capture potential externalities)
- Average hardware costs / household served
- Average "software" cost / household served
- Total capital investment costs (hardware) as a percentage of average income and as a percentage of poor household annual income
- Operating costs as a percentage of average monthly income and of poor monthly income

Equity (effectiveness in reaching the poor)

- Average income of population reached by the project vs. average income of overall population (also use median income if data is available)
- Qualitative assessment of:
 - Errors of exclusion (what percentage of the poor population did not obtain the subsidy?)
 - Errors of inclusion (what percentage of the population obtained the subsidy even though they are above the poverty threshold?)
- Size of household overall contribution (including capital costs) vs. average income of poor household (as an indicator of affordability for the poor)
- Size of household overall contribution (including capital costs) vs. average income of median household (as an indicator of affordability for median households)

Financial sustainability

- Cost recovery indicators: operating cost recovery, capital cost recovery and total project cost recovery (estimated as the percentage of non-subsidized funds covering actual costs)

Scalability

- Number of unserved population (or household) vs. financing availability: how much would it cost to serve all unserved households/ population (in the area of the program and in the country) with this sanitation solution? Compare this to the annual sanitation budget in the country, and to the annual public sector budget (give %)
- Any evidence of spontaneous uptake of what the program offers or demand for expansion?

Note: in the case of projects / programs that span several areas or cities, the analysis should be disaggregated as much as possible and seek to use location-specific data (including in terms of income or poverty levels).

[C] Overall evaluation

- Was the program considered to be a success overall? If sanitation was one element of a broader program, was the sanitation component considered to be a success? If not, why not?
- Did the program reach the intended recipients? What (anecdotal) reflections do the program managers have on how it actually evolved? Were there positive spin-offs, unintended consequences, unforeseen barriers?
- When both on-site sanitation and sewerage connection were available, did users have the choice between those solutions or were areas planned to be served differently by the program designers? How did the financing structure influence users' willingness to invest in either mode of service?
- Based on a qualitative assessment, to which extent was the financing scheme a determinant of either success or failure of the particular program / project?
- Was the financing scheme seen as a good match for the level of service and additional interventions provided?
- Do you know of any parallel program that may have affected the results of the project / program under consideration (for example, if an NGO-led program has been providing "free facilities" whereas the program only provided credit)?

Annex I - Indicative bibliography

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