Sanitation Finance in Rural Cambodia

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The Water and Sanitation Program is a multi-donor partnership administered by the World Bank to support poor people in obtaining affordable, safe, and sustainable access to water and sanitation services.

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Executive Summary

This document presents the findings of a study on sanitation finance in Cambodia conducted for the Water and Sanitation Program (WSP) with support from the Asian Development Bank (ADB). The overall objective of the assignment was to consider sustainable sanitation financing options with a focus on promoting access for the poorest.

This guidance note contains an introduction on sanitation financing and subsidies, stating the cases for subsidies as well as some of their practical pitfalls. The study used data (as of late 2009) from two case studies of rural sanitation finance in Cambodia to illustrate the practical issues, supplemented by preliminary data from two sanitation marketing projects. The study also examined the potential use and effectiveness of (hardware) subsidies, conditional cash transfers (CCTs), and other financing approaches relevant for sanitation improvement.

The document ends with recommendations for improved sanitation finance, including practical suggestions for sanitation programs in Cambodia. These recommendations bear particular relevance for the ADB's Second Rural Water Supply and Sanitation Sector Project, which commenced in 2010.

PUBLIC FINANCE OF SANITATION

Sanitation improvement provides a particular development challenge due to the difficulty of generating private demand for sanitation facilities. Awareness of the private and external costs of inadequate sanitation is generally low in developing countries. Despite widespread diarrheal disease and high child mortality rates, health costs are rarely ascribed to unhygienic sanitation practices, toilets are often perceived to be unaffordable, and demand for improved sanitation remains low.

Everyone without an improved sanitation facility is "sanitation poor" and, therefore, will benefit from public support to improve sanitation. Furthermore, each new improved sanitation facility will reduce the number of pathogens in the environment, thus provide societal as well as private benefits. In a context of low demand for sanitation, this framework suggests that there is little need for targeting (among those not using improved sanitation facilities) as any new toilet will be beneficial.

The best welfare-enhancing approaches would target the poorest first, due to the higher marginal value of each monetary unit among the poorest. But, in practice, sanitation programs often target the "low-hanging fruit" – those without improved sanitation facilities that are more willing to invest, more responsive to promotional programs, and easier to reach. The intention of this targeting is that, in addition to the benefits from the additional sanitation facilities, the supply of sanitation goods and services to these responsive households will build a larger sanitation market, thus developing the economies of scale and common good practice that will be needed to change sanitation behavior and spending priorities among the poorest households.

In Cambodia, where 77 percent of the rural population lack improved sanitation and 35 percent of rural households are below the official poverty line, more than half of those without improved sanitation facilities are non-poor households. As a result, sanitation programs that target "low-hanging fruit" tend to benefit largely non-poor households because many sanitation programs require a household contribution that is unaffordable or unattractive to poor households.

The exact relationship between health outcomes and sanitation status remains uncertain, but children from poor households have significantly higher mortality and malnutrition rates than those from non-poor households; and the risk of diarrheal disease in Cambodia is three to four times higher among severely underweight children. Therefore, children from poor households, particularly those that are malnourished, are likely to contribute more pathogens to the environment through unsafe excreta disposal than children from non-poor households. As a result, sanitation strategies that fail to deliver improved sanitation to poor households are likely to have less optimal outcomes, with fewer health and economic benefits, than those that succeed in reaching the poor.

TYPE OF BENEFIT

The social welfare literature suggests that cash transfer is the best instrument for addressing concerns about poverty and inequality because it respects the principle of consumer sovereignty, allowing beneficiary households to allocate the additional income they receive to the good or service representing the highest priority for the household. Cash transfers also avoid potential distortions in economic decisions caused by changes in the relative prices of goods.

Despite the theoretical advantages of cash transfers, the prevalent instruments of social policy and sanitation finance in most developing countries are in-kind transfers. The practical concerns associated with cash transfers in developing countries, such as administrative constraints linked to limited financial infrastructure, inefficient targeting mechanisms, and the risk of corruption, result in most programs utilizing in-kind transfers. In addition, there is no guarantee that cash transfers will be used to improve human capital unless specific conditions are attached to the use of the transfers, which further complicates the administrative requirements.

Recent growth in the use and effectiveness of conditional cash transfers demonstrates that the administrative requirements are no longer insurmountable in developing countries. Technological advances mean that the options for financial payment, means testing and compliance monitoring systems have improved dramatically; while there is increasing evidence of the drawbacks of conventional in-kind subsidies.

MINIMUM BENEFIT LEVEL

The administrative cost associated with any benefit transfer system – for operation of the targeting, delivery and monitoring systems – limits the minimum effective size of the benefit. Significant economies of scale are available in the administration of national benefit programs, and additional economies are available from the use of existing targeting and financial systems. Nevertheless, the benefit level needs to be set high enough to justify the administrative expenditures.

It is also important that the benefit level is set high enough to have an impact on the beneficiaries' behavior and investment decisions. A recent review of conditional cash transfer (CCT) programs found that monthly benefit payments ranged between 1 percent and 29 percent of pre-transfer household expenditures. In Cambodia, this implies a CCT benefit level of US$1 to US$20 per month, or as much as US$240 per household per year, which is higher than the transfer provided by most sanitation programs.

However, improvements in sanitation behavior take time, thus there is an argument for the provision of benefits over a longer time period in order to achieve sustained improvements in behavior. The first step towards improved sanitation is to stop open defecation through a change in individual sanitation behavior. Sanitation finance mechanisms should recognize that sanitation improvement involves a number of different steps over time, including initial behavior change, construction of a sanitation facility, adoption of improved sanitation behaviors, improvement of the sanitation facility, and safe disposal of wastes.

Therefore, while sanitation policies and strategies should promote universal use of improved sanitation facilities, sanitation finance should be designed to promote and support the adoption of a range of sanitation behaviors, and a range of sanitation technologies that will change as individuals and communities become more familiar with improved sanitation behavior and more willing to invest in improved sanitation services. Importantly, the setting and financing of any minimum level of sanitation service should not preclude or prevent the construction of low-cost hygienic facilities, or constrain the development of innovative, local latrine designs.

SERVICE DELIVERY

Recent research by the IDE Cambodia sanitation marketing project (supported by WSP and USAID) found that local producers in two provinces were willing to provide the basic below-ground components of a pour-flush latrine for a total cost of only US$25. Yet a similar package of latrine materials provided by private contractors through the ADB Tonle Sap Rural Water Supply and Sanitation Program (TS-RWSSP) currently costs more than US$88 per latrine.

Wherever possible, sanitation programs should aim to support the provision of services through local markets rather than through parallel project delivery systems. The intention is to reduce the costs of supply, to provide the user with a choice of service providers, to make the service provider accountable to the user of the services (rather than to the financier or project manager), and therefore to encourage competition and service improvements among suppliers and service providers.

CONDITIONAL CASH TRANSFERS FOR SANITATION IMPROVEMENT

Although a relatively recent phenomenon, the CCT literature contains a number of evaluations that highlight the success of CCT programs in improving the uptake of health and education services such as preventive health checkups, vaccinations, and school enrolment. However, the evidence that these gains result in improvements in health and education outcomes is mixed, with recent evaluations reporting little or no improvement in malnutrition rates and learning outcomes.

Recent research has confirmed that inadequate sanitation plays a significant role in the nutritional status of children. The intuition that diarrheal disease caused by inadequate water supply and sanitation affects nutritional uptake, and that malnutrition in turn increases the relative risk of diarrheal disease, is supported by a recent collective expert opinion that about 50 percent of the consequences of malnutrition are caused by inadequate water and sanitation services and poor hygienic practices. Repeated infections, especially diarrhea and helminthes, caused by poor environmental health lead to underweight (low weight for age) and stunted (low height for age) children, and these conditions, in turn, make these individuals more predisposed to predatory infections and chronic diseases later in life.

Most CCT nutrition programs target mothers with young children, with regular payments made based on records of health and nutrition service use (including child growth monitoring, vaccinations and attendance at nutrition seminars). Despite increased awareness of the links between malnutrition and diarrhea, few nutrition programs include any components that promote improved sanitation and hygiene. Initial discussions suggest that the current failure to link sanitation improvement and nutrition provides a significant opportunity for the improvement of CCT nutrition programs, through the potential for additional conditions that encourage the use of improved sanitation facilities and the achievement of collective sanitation outcomes.

CASE STUDIES

Four case studies were completed as part of the research for this study. The first two were detailed case studies of programs that had already been running for three years (as of 2009 where the study was undertaken), using preliminary household survey data collected by WSP's Economics of Sanitation Initiative (ESI) Phase 2 study:

- ADB Tonle Sap Rural Water Supply and Sanitation Project (ADB TS-RWSSP);
- Plan Cambodia CLTS program.

The other two case studies were partial assessments of sanitation marketing interventions[1]:

- IDE sanitation marketing project;
- WTO and LienAid sanitation marketing project.

The information on the case studies was drawn from ESI household surveys (where available), interviews with program managers and technical advisers, data provided by the implementing organizations, and analysis conducted by the author.

ADB TONLE SAP RURAL WATER SUPPLY AND SANITATION PROJECT

The TS-RWSSP is the largest rural sanitation program in Cambodia, with an estimated US$5.1 million spent on the sanitation component over the last three years. The project area includes 3.42 million people, who comprise roughly 25 percent of the total population of Cambodia. The project villages will include about one in four of all villages within the five provinces, thus the project aims to make a substantial impact on quality of life and environmental health within these provinces.

Expenditure data collected by the WSP ESI study suggest that the typical user contribution per ADB pour-flush latrine is as follows:

• Cash contribution	= US$90
• In-kind materials	= US$46
• Labor	= US$1
Total household	= **US$137 per latrine**

In 2007, data collected by the WSP-IDE sanitation demand assessment study suggested that 73 percent of rural households (that do not own a latrine) were willing to pay US$10 for a pit latrine. The same data suggest that just over 40 percent would be willing to pay US$30 for a pit latrine (the cost of the "sanitation core" currently being promoted by the IDE sanitation marketing program), and that only 15 percent would be willing to pay the US$80 contribution demanded by the ADB TS-RWSSP.

The project expenditure data show that three-quarters of the sanitation investment to date has been on pour-flush latrines, all of which are likely to have been built by non-poor households that could afford the US$80 cash contribution; while at most half of those that built dry latrines are likely to be poor households (as the level of investment made in building the latrine superstructures indicate that the majority were non-poor households). In total, only about 10 percent of the sanitation investment appears to have reached those below the poverty line; the remaining 90 percent has benefited non-poor rural households that took advantage of the generous subsidies offered by the ADB TS-RWSSP.

PLAN CAMBODIA COMMUNITY-LED TOTAL SANITATION PROGRAM

The Plan Cambodia Community Led Total Sanitation (CLTS) program was initiated as a pilot project in two villages in 2006. Since then, the program has expanded to cover another 45 villages with a total expenditure of just under US$0.5 million. The Plan interventions aim to achieve

[1] At the time of the study in late 2009, these sanitation marketing programs were just recently launched.

open defecation free communities, where 100 percent of the population use sanitation facilities. As in most CLTS programs, no hardware subsidy or in-kind benefits are provided to households that build private sanitation facilities.

The ESI household survey data suggest that, while significant numbers have built latrines without any external subsidy, latrine coverage and usage levels are low. Latrine usage (among those that own latrines) is estimated at 64 percent, based on the number of non-operational latrines reported in the ESI survey villages. Therefore, 41 percent of the project population are using their latrines, with another 23 percent having abandoned their latrines, and the remaining 35 percent with no latrines.

The 2009 MRD CLTS evaluation in Cambodia found that a similar proportion of simple CLTS latrines had been abandoned during the rainy season due to flooding or collapse. However, the MRD evaluation also reported that most of the people who had abandoned their latrines were practicing "dig and bury" techniques during the rainy season and planned to return to latrine use once the rains were finished and they were able to clean and repair their latrines.

More than two-thirds of the Plan latrine-owning households reported that they had not used any cash in the construction of the latrine, with the total latrine cost valued at only US$11, including all labor and in-kind materials. The remaining households with self-built toilets reported an average cash expenditure of US$6 on top of similar in-kind material and labor contributions, making a total cost of US$17. Therefore, the average amount spent on a latrine in the Plan households surveyed was less than 10 percent of the amount spent on the ADB latrines.

IDE SANITATION MARKETING PROJECT

The project is supported by both WSP and USAID, with a combined budget of US$760,000 over a 21-month period. The project target is to sell 10,000 household latrines in two provinces using a market-based approach with no sanitation hardware subsidy. The R&D work enabled IDE to identify strong demand for a package of latrine components that enables rural households to build their own pour-flush latrine, including a basic enclosure, for as little as US$30. The main implementation phase was launched in late 2009, immediately prior to the fieldwork for this study, thus the review herein is based largely on proposed implementation plans rather than an evaluation of project outcomes.

Willingness to pay data from an IDE study completed in 2007 suggest that less than 43 percent of households without a latrine will be willing to pay this much – US$30 or more – for a new latrine. Given that roughly half of those without latrines are below the poverty line, these data imply that few poor households will be willing or able to afford the IDE latrine core package.

However, IDE reports that its initial village marketing campaigns have generated sales right across communities, with even poor households committing to invest US$25 in the latrine core package (with another US$5 to be spent on the enclosure). Willingness to pay estimates are notoriously unreliable, thus it is possible that effective marketing of a more desirable sanitation product has shifted the willingness to pay curve upwards, capturing a far higher proportion of those without latrines at the US$25 price point.

The program cost data suggest that the following average costs will be linked to the program sanitation development activities:

Software (hygiene promotion, training)	= US$20 per latrine
Program costs (management, technical assistance)	= US$56 per latrine
Average project sanitation cost	**= US$ 76 per latrine**
Household contribution (cash and in-kind)	= US$60 per latrine
Average total latrine cost	**= US$136 per latrine**

WTO-LIENAID SANITATION MARKETING PROJECT

The World Toilet Organization (WTO) and LienAid sanitation marketing project builds on the research and development work done by the IDE project, supplemented by its own research on reasons for investment in sanitation facilities. One of the key differences between the two sanitation marketing projects is that the WTO-LienAid project has identified a durable superstructure as critical to the success

of rural sanitation interventions, thus the project would also market flat-pack latrine enclosures.

As of the time of the study in 2009, the WTO-LienAid program is not yet in its full implementation phase, but it planned to sell 4,000 latrine packages through trained producers over the following 12 months. Given a total budget of US$338,000, achievement of this target will result in a program cost per latrine of about US$84.

The cost data suggest that the following average costs will be linked to the project sanitation activities:

Software (marketing, research, strategy)	= US$28 per latrine
Program costs (management, technical assistance)	= US$56 per latrine
Average project sanitation cost	**= US$ 84 per latrine**
Household contribution (cash and in-kind)	= US$80 per latrine
Average total latrine cost	**= US$164 per latrine**

COMPARATIVE ANALYSIS OF CASE STUDIES

The comparative analysis confirms that public finance for sanitation in Cambodia is not reaching those below the poverty line. Ninety percent of the public finance for the large ADB program goes to non-poor households, and the two sanitation marketing projects will require households to contribute at least US$30 in order to obtain a latrine, whereas the willingness to pay data imply that US$10 is the maximum amount that most poor households are willing to spend on a latrine.

The Plan CLTS program promotes far cheaper and simpler facilities than the other programs, which should be more affordable and appropriate for poor households. However, 35 percent of households in its program communities continue to practice open defecation, and most of these open defecators are likely to be poor households.

The use of public finance to subsidize the development, promotion and marketing of appropriate sanitation products is to be encouraged, but there is a risk that the current sanitation marketing programs will not benefit many poor households. It is important that an appropriate amount of public finance is directed towards developing and marketing products and services that are specifically targeted at the poorest households and those that cannot afford the US$30 sanitation core package.

Finally, few of the programs examined have been successful in achieving collective sanitation outcomes, such as open defecation free communities, which should be the ultimate aim of all sanitation programs (in order to achieve the optimal benefits). The population segment that practices open defecation in the program communities is largely made up of poor households, and generally includes those with the highest disease burdens – those that are most likely to transmit diseases to others through unsafe excreta disposal. As a result, the benefits achieved by these sanitation programs may be limited.

LESSONS AND RECOMMENDATIONS

1. Leave no one out: complementary programs are needed to reach all groups
2. Check who benefits: monitor targeting effectiveness
3. Aim for efficiency: recognize the advantages of market-led service delivery
4. Use vouchers to encourage sustainable service provision
5. Design finance for long-term improvements in sanitation practice
6. Use large-scale means testing systems wherever possible
7. Develop effective compliance monitoring systems

INNOVATION: THE GROW-UP-WITH-A-TOILET PLAN

The following plan is proposed to ensure that every child in Cambodia "grows up with a toilet" through the provision of sanitation finance to poor households during the first five years after their first child is born. The intention is that the development of improved sanitation facilities and the establishment of good sanitation practices among both parents and the first-born will ensure that the rest of the family grows up using a hygienic latrine and observing good sanitation and hygiene practices.

The five-year plan would be targeted at poor mothers on the birth of their first child, on the basis that poor children under-five are the highest risk group for diarrhea, malnutrition and worms. Assistance would be provided to the mother of the household to improve household sanitation throughout the five-year period, with both connection subsidies (incentives for the construction of facilities) and outcome-based sustainability incentives (to encourage long-term improved sanitation practices).

Year 0 (birth of first child)	US$15 toilet voucher (redeemable by local producers)
Plus	US$5 rebate on construction of second latrine pit
Year 1-5 (annual reward)	US$0-10 each year based on following criteria • Toilet usage (verified) • Village toilet coverage (verified) • Completion of hygiene course • Presence of handwashing facility

The plan would be supported by demand creation programs (CLTS, mass media), sanitation marketing programs to increase and improve the supply of low-cost sanitation goods and services, and microfinance programs to enable non-poor households to develop improved sanitation facilities.

The intention of the plan is three-fold: firstly, to focus attention on the need to target sanitation finance towards improved sanitation among under-five children; secondly, to recognize that sanitation finance should promote a process of sanitation development over a period of several years (providing incentives for the upgrading of facilities and the adoption of improved behaviors); and thirdly, to encourage more efficient demand-side financing through vouchers and cash transfers in place of existing mechanisms for the supply of in-kind materials and services.

Abbreviations and Acronyms

ADB	Asian Development Bank
CCT	Conditional cash transfer
CLTS	Community-Led Total Sanitation
DHS	Demographic and Health Survey
ESI	Economics of Sanitation Initiative
FGD	Focus group discussion
HH	Household
IDE	International Development Enterprises
JMP	WHO-UNICEF Joint Monitoring Programme for Water Supply and Sanitation
MDG	Millennium Development Goal
ODF	Open defecation free
TS-RWSSP	Tonle Sap Rural Water Supply and Sanitation Project
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
US$	United States dollar
WASH	Water, Sanitation and Hygiene (Sector)
WHO	World Health Organization
WSP	Water and Sanitation Program of the World Bank
WTO	World Toilet Organization

Glossary of Terms

Administrative costs: The costs required to deliver services, including identification of target population, dealing with appeals, processing payments, undertaking monitoring and evaluation, and exercising oversight.

Conditional cash transfer: Provision of money to poor families contingent on them making investments in human capital, such as keeping their children in school or taking them to health centers on a regular basis.

Error of inclusion: The inclusion of an ineligible person in a program.

Error of exclusion: The exclusion of a person who meets eligibility criteria of a program.

Externality: A consequence of activity that affects other parties without this effect being reflected in the cost of the goods or services involved.

Fee waiver: Exemption from service charges granted to individuals (usually based on personal characteristics such as poverty).

Geographic targeting: A targeting method in which location determines eligibility for benefits or allocates budget to concentrate resources on specific areas.

In-kind transfer: Provision of additional non-monetary resources to households such as food rations or latrine components.

Internalized costs: Costs that are incorporated into the pricing structure of goods or services, such as social costs of the manufacture and use of a product.

Market failure: Inefficient production or use of goods and services by the market, often associated with non-competitive markets, externalities or public goods.

Means testing: A targeting method based on income that seeks to collect comprehensive information about household income and wealth.

Poverty line: Cut-off point separating the poor from the non-poor, either based on monetary (e.g. consumption level) or non-monetary (e.g. a certain level of literacy) measures.

Proxy means testing: A targeting method based on fairly easy to observe household characteristics, such as the location and quality of the household's dwelling, ownership of durable goods, demographic structure, education and so on.

Subsidy: Financial measure aimed at controlling the prices of food or other essential commodities and services.

Targeting: The effort to focus resources among those most in need of them.

Voucher: A printed coupon or ticket that entitles the holder to a discount or can be exchanged for specific goods or services. Also called a “near cash transfer”.

Content

I. Introduction

This guidance note presents the findings of a study on sanitation finance in Cambodia conducted for the Water and Sanitation Program (WSP). The overall objective of the assignment was to consider sustainable sanitation financing options with a focus on promoting access for the poorest.

This document contains an introduction on sanitation financing and subsidies, stating the (economic and public health) cases for subsidies as well as some of their practical pitfalls, in order to introduce and frame the sanitation financing debate for a wider audience. The study utilized two case studies of rural sanitation finance in Cambodia to illustrate the practical issues, and the data from these case studies were supplemented by preliminary data from two recently-launched sanitation marketing projects. The study also examined the potential use and effectiveness of (hardware) subsidies, conditional cash transfers (CCTs) and other financing approaches relevant for sanitation improvement.

The guidance note ends with recommendations for improved sanitation finance, including practical suggestions for sanitation programs in Cambodia. These recommendations bear particular relevance for the ADB's Second Rural Water Supply and Sanitation Sector Project, which commenced in 2010.

1.1 OBJECTIVES

The assignment had the following specific objectives:

- Using existing information to the extent possible, study existing projects and information to develop an understanding of the different approaches to sanitation promotion used in country, and their strengths and weaknesses;
- Based on available and collected information, analyze one CLTS-based and one subsidy-based sanitation program, using the format and analytical structure provided through the WSP global study of sanitation financing (thus contributing to the global database on sanitation financing);
- Given an understanding of the pitfalls of traditional sanitation subsidies (and informed by positive examples in Cambodia and elsewhere), develop alternative financing recommendations that avoid issues with targeting, administration, technology choice, perverse incentives, etc.;
- Expressly consider the applicability of CCT approaches, including practical suggestions for piloting and implementation if such approaches appear feasible.

1.2 METHODOLOGY

The study involved three weeks spent in Cambodia, including field visits to project communities of the ADB Tonle Sap Rural Water Supply and Sanitation Project (TS-RWSSP); consultations with sector stakeholders; attendance at a one-day World Bank-led seminar on Community Cash Transfers; and secondary research.

Two sanitation finance case studies were prepared, one on the ADB TS-RWSSP and the second based on the Plan Cambodia CLTS program. The case studies utilized household survey data collected for the second phase of the WSP Economics of Sanitation Initiative (ESI), notably on household investments in sanitation facilities; and program finance data obtained directly from the ADB and Plan program managers. In addition, comparative studies were made of two sanitation marketing programs by IDE and WTO-LienAid.

The case study analysis was based on the template developed by the WSP Global Sanitation Finance study in order that the findings are comparable with those from other WSP country studies.

II. Public Finance of Sanitation

2.1 GENERAL CASE FOR PUBLIC FINANCE OF SANITATION

The case for the public finance of sanitation rests on the consequence of individual sanitation behavior on the health and well-being of other people. In economic terms, unhygienic sanitation behavior by an individual causes a negative externality, in that bad sanitation practice has adverse effects on the health and well-being of others.

In most instances, the polluter does not have to pay for bad sanitation practice, thus the practice is more widespread than it would be if the individual were held accountable for these external costs. Furthermore, those who incur these external costs do so involuntarily, resulting in outcomes that are neither socially nor economically optimal.

The market-driven approach to correcting negative externalities is to internalize third party costs by requiring the polluter to repair or repay any damage caused. However, this is difficult when the true monetary value of the costs is hard to determine, or when the supply and demand for the goods and services are constrained because of market or information failures. Those who pollute the environment through open defecation would be charged the cost of cleaning up the environment and of any illnesses that result from fecal contamination, as well as the cost of the medical services provided to those were ill, and of the lost time and productivity of those affected by the open defecation. Clearly, this would be impractical given the difficulties of attribution, valuation and enforcement.

An alternative theoretical approach is for public finance to be used to reduce the negative externalities by increasing the private consumption of the "under-consumed goods", in this case by using public funds to promote private investment in hygienic sanitation practices. In practice, public finance has long been used to support the promotion of improved sanitation, but with mixed results.

This study tries to assess whether current approaches to the public finance of sanitation have been effective, and whether alternative approaches are likely to result in more socially or economically optimal outcomes.

FEWER PATHOGENS IN THE ENVIRONMENT?

Sanitation improvement presents a particular development challenge due to the difficulty of generating private demand for sanitation facilities. Awareness of the private and external costs of inadequate sanitation is generally low in developing countries. Despite widespread diarrheal disease and high child mortality rates, health costs are rarely ascribed to unhygienic sanitation practices; toilets are often perceived to be unaffordable; and demand for improved sanitation remains low.

Everyone without an improved sanitation facility[1] is "sanitation poor" and, therefore, will benefit from public support to improve sanitation. Furthermore, each new improved sanitation facility will reduce the number of pathogens in the environment, thus provide societal as well as private benefits. In a context of low demand for sanitation, this framework suggests that there is little need for targeting (among those not using improved sanitation facilities) as any new toilet will be beneficial.

Unfortunately, scarce public resources often force policy makers to concentrate or ration investments and interventions among specific population groups or geographical areas. The best welfare-enhancing approaches would target the poorest first, due to the higher marginal value of each monetary unit among the poorest. But, in practice, sanitation programs often target the "low-hanging fruit" – those without improved sanitation facilities who are more willing to invest, more responsive to promotional programs, and easier to reach. The intention of this targeting is that, in addition to the benefits from the additional sanitation facilities, the supply of sanitation goods and services to these responsive households will build a larger sanitation market, thus developing the economies of scale and common good practice that will be needed to change sanitation behavior and spending priorities among the poorest households.

LOWER HEALTH AND ECONOMIC BENEFITS DUE TO INCLUSION ERRORS

In Cambodia, where 77 percent of the rural population lack improved sanitation and 35 percent of rural households are below the official poverty line, more than half of those without improved sanitation facilities are non-poor households. As a result, sanitation programs that target "low-hanging fruit" tend to benefit largely non-poor households. This is because many sanitation programs require a household contribution that is unaffordable to the poorest households. In addition, the rationing and allocation of subsidies through local leaders means that those who are well connected often obtain benefits ahead of the poorest households.

There is a social justice question associated with the use of scarce resources to provide subsidized sanitation facilities to non-poor households at the expense of poor households. There is also an important issue regarding the alignment of sectoral objectives, often focused narrowly on increasing coverage numbers, with wider national objectives of poverty alleviation, welfare improvement and social protection. But, most importantly, there is a risk that the benefits of public investment in improved sanitation are limited by an approach that fails to reach the poor, due to the lower disease and mortality burden found among non-poor households.

Household survey data from Cambodia[2] illustrate the extent of the problem. These data confirm that children from poor households have significantly higher mortality and malnutrition rates than those from non-poor households[3]; and that the risk of diarrheal disease is three to four times higher among severely underweight children.

The exact relationship between these health outcomes and sanitation status remains uncertain[4], but children from poor households, particularly those that are malnourished, are likely to contribute more pathogens to the environment through unsafe excreta disposal than children from non-poor households. Therefore, sanitation strategies that fail to deliver improved sanitation to poor households are likely to have less optimal outcomes, and fewer health benefits, than those that succeed in reaching the poor.

[1] Defined by the WHO-UNICEF Joint Monitoring Programme for Water Supply and Sanitation as "facilities that ensure hygienic separation of human excreta from human contact" in JMP (2008) *Progress on drinking water and sanitation: a special focus on sanitation* New York: WHO-UNICEF Joint Monitoring Programme for Water Supply and Sanitation.

[2] DHS (2006) *Cambodia: Demographic and Health Survey 2005* Maryland: ORC Macro and National Institute of Statistics.

[3] Under-five mortality rates in Cambodia were found to be 39 percent higher across the bottom two wealth quintiles than in the fourth quintile; similarly, the proportion of severely underweight children was 76 percent higher in the bottom two wealth quintiles than in the fourth quintile. Recent research in Laos indicated that severely underweight children aged 0 to 4 years had 2.8 times higher likelihood of diarrhea than children with normal weight-for-age status, with 3.6 times higher likelihood of diarrhea found in severely underweight children aged 0 to 11 months (analysis based on Lao PDR MICS 2006 household survey data, to be published in UNICEF (forthcoming) *Lao PDR: Child well-being and disparities – health, nutrition, water sanitation hygiene, education and protection*).

[4] Higher sanitation coverage is generally associated with better health outcomes, but the relative importance of the factors that influence these outcomes are not well known; for instance, there is little understanding of the role that unsafe infant excreta disposal plays in determining health outcomes (considering that this practice is often independent of the use of sanitation facilities by adults and older children).

IMPORTANCE OF ACHIEVING COLLECTIVE SANITATION OUTCOMES

In theory, the negative externality associated with unhygienic sanitation practice means that open defecation or unsafe excreta disposal by even one person will adversely affect other people. Therefore, the full benefits from public sanitation finance, which aims to reduce these negative externalities, will not be available unless collective sanitation outcomes, such as open defecation free status or 100 percent improved sanitation coverage within a community, are achieved.

In practice, the consequence of one person's, or one household's, unsafe excreta disposal on a wider group proves hard to measure. While some evaluation findings[5] suggest additional reductions in diarrheal prevalence from open defecation free (ODF) outcomes, and anecdotal evidence is mounting of reduced clinical caseloads in rural health centers surrounded by ODF communities[6], there remain sufficient doubts over the rigor, scale, and cross-sectional nature of these findings to question the importance of the external effects of unhygienic sanitation practice.

Nevertheless, it remains true that excreta-related pathogens will remain in the environment until everyone uses improved sanitation all of the time[7], hence that the gains from investing in collective sanitation outcomes (on a community by community basis) should be higher than those from equivalent incremental increases in sanitation coverage across a wider population.

2.2 DEVELOPMENT OBJECTIVES

There is some tension in the discussion of development objectives between economic development models, which aim to reward entrepreneurship and hard work by putting money into as many pockets as possible, and social development models, which recognize the market failures that prevent poor and disadvantaged people from playing a full and active part in the economy.

The economic development model is related to the "low-hanging fruit" approach discussed earlier, whereby support to responsive individuals and households is intended to leverage sanitation investments by others (commercial, private and non-government) and, eventually, it is hoped that the benefits from these investments will trickle down to poor and disadvantaged households.

The social development model suggests that direct interventions and positive discrimination are necessary to tackle pockets of deprivation, with benefits targeted explicitly at poor and disadvantaged households in order to lift them out of poverty, improve their well-being and enable them to be productive members of society.

Social development approaches are often favored in developing countries, but suffer from serious targeting and efficiency problems. Therefore, any attempt to direct sanitation finance towards specific segments of the population (poor households, mothers, disadvantaged households, people living in areas with difficult ground conditions) needs to utilize a robust targeting system and include explicit mechanisms for monitoring the efficiency of service delivery.

[5] RMRCT (2007) Quantitative microbial risk based approaches to evaluate Nirmal Gram and Non Nirmal Gram Villages of Rewa District, Madhya Pradesh UNICEF Project report; Knowledge Links (2007) Formative research: development of sanitation IEC manual for Himachal Pradesh.
[6] For instance, in Lumajang District, East Java, Indonesia.
[7] This broad description includes safe infant and child excreta disposal; use of improved sanitation while away from home (at school, in markets, in the fields); and implies safe disposal of wastes from sanitation facilities.

These contrasting development objectives appear to require a mixture of universal interventions designed to stimulate economic development by leveraging sanitation investments from a wide spectrum of the population, and more targeted interventions aimed at providing benefits directly to excluded groups and deprived households.

2.3 TARGETING

Concentrating resources on the poor or disadvantaged can increase the benefits that these resources achieve within a given budget, or can achieve a given impact at the lowest cost. In practice, the full theoretical gain is not realized because targeting is never completely accurate, and because costs are associated with targeting[8].

Programs aim to focus resources on the poor without incurring unacceptably high errors of exclusion[9] or costs (administrative, private and incentive). Several different targeting methods can often be used for a particular type of program; for instance cash and in-kind transfers can be targeted by means tests, proxy means tests[10], nutritional status or risk factors, geographic area, demographic characteristic, or self-selection. For a single program to use a number of methods is common, for example first using geographic targeting to identify poor areas and then proxy means testing to identify beneficiary households. This combined approach usually yields better targeting than use of a single method[11].

The social protection literature suggests that means tests and proxy means tests have the highest costs, but tend to produce the lowest errors of inclusion[12] and are often good investments. Self-selection, via setting a low benefit level, and geographic targeting are also powerful and proven targeting tools.

MEANS TESTING

Means testing systems are evolving and improving rapidly. A new system called ID-Poor has been instituted in Cambodia over the last few years, which provides photo-identity cards to households identified as very poor (Poor Level 1) or poor (Poor Level 2) based on an asset scoring system.

The ID-poor system is now in place, either fully or partially over different time horizon, in all provinces in Cambodia, and is being used as the principal targeting mechanism for Health Equity Funds, which provide health service fee waivers to households identified as poor through their ID-poor cards.

Implementation of the ID-poor system costs about US$1.50 per household, with similar investments required every two years to update the system. There are plans for third party verification of the ID-poor system in 2010 and, as the number of programs that utilize the ID-poor system grows, it seems likely that the accuracy of the targeting and the performance of the system will improve further. Use of the same targeting system by several different programs should enable the administrative costs to be shared, giving the ID-poor system substantial financial advantages over program-specific targeting systems.

[8] Grosh et al (2008) For protection and promotion: the design and implementation of effective safety nets Washington DC: The World Bank.
[9] Error of exclusion: the exclusion of an eligible person from a program.
[10] Proxy means tests use easy to observe household characteristics (such as housing quality, ownership of durable goods, demographic structure and education) as substitutes for measures of income or wealth.
[11] Ibid.
[12] Error of inclusion: the inclusion of an ineligible person in a program.

BOX 1. PROXY MEANS TESTING WHERE ADMINISTRATIVE CAPACITY IS LOW: CAMBODIA'S SCHOLARSHIP PROGRAMS

Because Cambodia has rather less administrative capacity than the middle-income Latin American countries where proxy means testing originated, it has adapted the general practice of proxy means testing in a way that makes rigorous but simplified testing viable. The schools that participate in its scholarship program are subject to a prior round of geographic targeting, and applicants complete a proxy means test that is used to allocate scholarships among each selected school's students.

Cambodia's CESSP program dispenses with the cadre of field worker/social workers who often administer the instrument. Instead, students fill out the program application/proxy means test form in school. Then the teacher reads the information aloud and the classmates help verify/certify that it is correct. A local committee of school and community leaders score the forms by hand.[a] To assist in manual scoring, the formula uses only integers.

The ranking is done only within schools, rather than against a national standard as in most proxy means tests. In each school, the scored forms are arranged by score and the poorest children, up to the quota for that school, are selected for the scholarship. This process implies that recipients in poorer schools will be poorer, on average, than recipients in less-poor schools. It is thus less accurate than a ranking against a national standard, but eliminates the need for a national database and the information technology and communications networks that would be required to support it.

In a previous scholarship program, the formula was not very sound, so the committees were given leeway to deviate when they thought it appropriate; and when they did so, the students selected were, in fact, poor (as judged later by an evaluation survey). Subsequently the formula was based on statistical analysis of the same type used elsewhere, and the discretion of the local committees was reduced.

[a] In the first year of the CESSP program, an independent firm scored the forms centrally.
Source: CESSP scholarship team 2005 in Fiszbein and Schady (2008) *Conditional Cash Transfers: reducing present and future poverty* Washington DC: The World Bank, Policy Research Report.

SELF-TARGETING

Self-targeting goods are those that are widely and disproportionately consumed by the poor and are, therefore, most likely to ensure that any associated subsidies reach the desired target population. The best candidates for self-targeting goods are those that meet the following criteria[13]:

- Universal reach among poor households
- Significant percentage of expenditure among poor households
- Inferior goods with low or negative income elasticities[14]
- Differentiated by quality (e.g. lower quality variants are used by the poor)
- Not readily tradable

An examination of these criteria suggests that pour-flush latrine pans, which are one of the most commonly and heavily subsidized of sanitation goods, are not suitable for self-targeting. Latrine pans are not inferior goods; consumption of latrine pans is higher by rich households than by poor households (e.g. positive income elasticity); and latrine pans are tradable.

Recent demand studies in Cambodia[15] confirm that there is strong demand for pour-flush latrine pans, hence that many people may be willing to pay for them without subsidy. Given the importance of differentiating self-targeting goods by quality, there is a clear case for discontinuing any subsidy of pour-flush latrine pans in favor of goods that are utilized more frequently by poor households.

[13] Komives et al (2008) Water, electricity and the poor: who benefits from utility subsidies? Washington DC: The World Bank.
[14] The amount consumed (as a percentage of income) rises as income falls.
[15] Roberts M (2006) Demand assessment for sanitary latrines in rural and urban areas of Cambodia Phnom Penh: International Development Enterprises; and, Chapin J (2009) Design project: Sanitation marketing pilot project, final report Phnom Penh: IDEO and IDE.

INTRA-HOUSEHOLD TARGETING

Most sanitation programs target households based on a number of criteria, and then make transfers, or provide support, to the "head of the household". In contrast, conditional cash transfers[16] (CCTs) are often paid explicitly to mothers, on the basis that mothers have a stronger preference for investing in children than do fathers[17].

In addition, CCT conditions often apply to use of services by children aged 0 to 5 years, with the age limit set to allow continuous eligibility from birth to schooling. There is a strong argument for linking sanitation finance to child sanitation outcomes, and for targeting transfers at mothers. Diarrhea incidence is higher in children than in adults; 95 percent of sanitation-related deaths are among under-five children[18]; and, consequently, many of the pathogens that cause serious illness are passed on via unconfined child excreta.

In addition, the inter-generational effects of inadequate sanitation are significant. Children that grow up without improved sanitation suffer health, nutrition, growth, education, self-respect and life opportunity deprivations that prevent them developing to their full potential. Child mortality rates are associated with long-term economic growth[19], thus sanitation improvements are likely to have a dramatic economic impact in countries with low sanitation coverage and high child mortality.

Many of the serious and irreversible impacts of inadequate sanitation, such as premature death, stunting and impaired cognitive development, occur before children are five years old, thus sanitation investments targeted at pre-school children are likely to have a significant impact on their well-being and on economic development.

Women generally attach more value to sanitation than do men, thus are more likely than male household members to utilize transfers to improve sanitation. In circumstances in which women's power within the household is limited, conditions that mandate specific human capital investments, and transfers that strengthen the mother's bargaining position, will reinforce her ability to shift household spending and time allocation decisions to improve children's welfare.

AVOID PENALIZING EARLY ADOPTERS

Many sanitation programs target only households without sanitation facilities, which penalizes poor households that are early adopters of improved sanitation, and creates disincentives for the self-provision of sanitation facilities.

In contrast, the CCT targeting model provides benefits to all eligible households, i.e. those that meet poverty and other targeting criteria, and adopt good behaviors, on the understanding that these households (and their communities) will require lower public investments in basic services like health care due to better local outcomes.

Sanitation finance should aim to encourage and reward good sanitation behavior by poor households and, where possible, avoid disincentives to the early adoption and self-provision of improved sanitation. The implication is that sanitation finance should seek to promote longer-term behaviors and outcomes rather than just a one-time investment in a basic sanitation facility.

This approach is linked to the political economy argument of supporting the "deserving poor". In many countries, including developed ones, some voters object to the redistribution of wealth through unconditional handouts. The political economy argument suggests that transfers narrowly targeted at the poor tend to have limited support from the vast majority of taxpayers that finance but do not receive these benefits, unless these people are "deserving poor" who are being rewarded for investing in the health or education of their children. This argument reinforces the importance of extending targeting to include all poor households that invest in improved sanitation and hygiene behavior, whether or not these households already own or use an improved sanitation facility.

[16] Conditional cash transfer: provision of money to poor families contingent on investments in human capital, such as keeping their children in school or taking them to health centers on a regular basis.
[17] Fiszbein et al (2009) Conditional cash transfers: reducing present and future poverty Washington DC: The World Bank.
[18] Hutton et al (2009) Economics impacts of sanitation in Lao PDR: a five country study conducted in Cambodia, Indonesia, Lao PDR, the Philippines and Vietnam under the Economics of Sanitation Initiative The World Bank, Water and Sanitation Program.
[19] WHO (2001) Macroeconomics and Health: Investing in health for economic development Geneva: World Health Organization.

COLLECTIVE SANITATION OUTCOMES

Individual targeting criteria for transfer programs, which are usually based on some measure of household poverty or vulnerability, fail to promote collective sanitation outcomes. Sanitation finance mechanisms should also promote the achievement of collective sanitation outcomes through the inclusion of incentives to achieve both improved individual and improved communal sanitation outcomes.

Examples include additional conditions for the payment of benefits, such as in Maharashtra (India), where the payment of post-latrine construction rebates to below poverty line households is conditional on the verification of open defecation free (ODF) status in the community. Another possibility is the payment of additional benefits to poor households that both use improved sanitation facilities and live in ODF communities, subject to annual verification of this status.

2.4 TYPE AND LEVEL OF BENEFIT

There are essentially two alternative ways of providing direct assistance to low-income households: cash transfers and in-kind transfers.

The social welfare literature suggests that a cash transfer is the best instrument for addressing concerns about poverty and inequality because it respects the principle of consumer sovereignty, allowing beneficiary households to allocate the additional income they receive to the good or service representing the highest priority for the household[20]. Cash transfers also avoid potential distortions in economic decisions caused by changes in the relative prices of goods.

Despite the theoretical advantages of cash transfers, the prevalent instruments of social policy and sanitation finance in most developing countries are in-kind transfers. The practical concerns associated with cash transfers in developing countries, such as administrative constraints linked to limited financial infrastructure, inefficient targeting mechanisms, and the risk of corruption, result in most programs utilizing in-kind transfers. In addition, there is no guarantee that cash transfers will be used to improve human capital unless specific conditions are attached to the use of the transfers, which then further complicates the administrative requirements.

In-kind transfers should be service specific and aim to boost under-invested services. In the sanitation sub-sector, most in-kind transfers consist of construction materials for latrines, usually prefabricated items such as concrete slabs, concrete rings for lining latrine pits, squatting plates, latrine pans; or construction materials (cement, sand, gravel, wood, metal sheets, pipes) for the on-site construction of household latrines. Few of these items, with the exception of the latrine pans, meet the criteria that they can be used only for sanitation services.

In-kind transfers are almost always provided up-front, before construction or use of the facilities takes place, based on the understanding that the users are either too poor, or are unwilling, to construct the facilities without the up-front assistance. In many cases, households are asked to dig a latrine pit as a sign of their commitment to the latrine construction before the in-kind subsidy is provided. The main condition for the provision of the up-front subsidy is that the facility is constructed, thus there is often little formal monitoring of the use of the facility or of household sanitation behavior after the completion of the facility.

[20] Komives et al (2008) Water, electricity and the poor: who benefits from utility subsidies? Washington DC: The World Bank.

For instance, a review of the Total Sanitation Campaign in Andhra Pradesh (India) during 2005[21] found that while extensive video and photographic evidence confirmed that the up-front subsidies[22] provided by the state government had been used to build more than 1.6 million household latrines in less than a year, less than 50 percent of the new toilets were actually in use in the villages reviewed.

These problems argue for the use of output or outcome based finance, whereby rebates or fee waivers are granted to households that make specific investments or utilize specific services; cash transfers are made to households that achieve specific outcomes; and service providers are remunerated or rewarded based on performance measures such as the number of new latrines in use, the number of latrine pits emptied safely, or the number of low-cost sanitation products sold.

Critics of output or outcome based finance suggest that the administrative costs of the monitoring required to measure sanitation outputs and outcomes exceed the benefits from these approaches; and that output-based aid tends to favor the non-poor, as these households are often better able to mobilize the resources needed to meet the output or outcome conditions. In addition, outcome-based approaches risk penalizing people who live in areas where service provision is inadequate.

There is little hard evidence to support either viewpoint, as there are very few examples of output or outcome based sanitation finance in practice. However, there is increasing recognition that better monitoring of outputs and outcomes is required even when up-front subsidies are provided. Given undeveloped sanitation markets, it is also critical that sanitation programs include a component to improve the supply of sanitation goods and services, and that any failure to achieve the expected outcomes is carefully assessed to determine whether this reflects inadequate demand, ineffective supply, or other external constraints.

The key advantage of an *ex post* approach – one based on actual results rather than on forecasts of predicted behavior – is that it is less likely to create market distortions or have unintended consequences, such as through the finance or subsidy of goods and services that prove unpopular or ineffective.

MINIMUM LEVEL OF SERVICE

Sanitation program finance is often designed around a minimum level of service. Conventionally, the minimum level of service has been defined either by national standards or by an international categorization such as the JMP improved sanitation facility. The minimum level of service is intended to assure the promotion and use of hygienic sanitation facilities, thus to ensure that public finance generates improved health outcomes.

In reality, the relationships between use of different types of sanitation facility and individual or household health outcomes are poorly understood, both because a number of other factors (such as water use, hygiene practices, nutrition, climate, physical conditions, individual behavior and collective behavior) influence these outcomes, and because there is scant evidence that more expensive sanitation facilities provide greater health benefits than basic hygienic sanitation facilities[23].

The Disease Control Priorities report[24] quotes the World Bank Technical Advisory Group conclusion that "the greatest determinants of the efficacy of alternative facilities are, first, whether they are used by everyone all the time, and second, whether they are adequately maintained. … Pit latrines would, from the viewpoint of health rather than convenience, approximate the same rating as a water-borne sewerage system". Similarly, a rigorous study of the impact of drainage and sewerage on diarrhea in Brazil[25] found that "the impact of sanitation in individual households was not significantly affected by the type of toilet – there was no significant difference in the incidence of diarrhea between

[21] Robinson A (2005) Scaling up rural sanitation in South Asia New Delhi: The World Bank, Water and Sanitation Program South Asia.
[22] Provided as a mix of cash and rice vouchers (worth about US$62 in total) to below-poverty line households.
[23] Using the JMP definition of an improved sanitation facility as one that hygienically separates human excreta from human contact.
[24] Cairncross and Valdmanis (2006) Water supply, sanitation and hygiene promotion Chapter 41 pp.771-792 in Jamison et al (2006) Disease control priorities in developing countries: Second edition Washington DC: The World Bank and Oxford University Press.
[25] Moraes et al (2003) Impact of drainage and sewerage on diarrhoea in poor urban areas in Salvador, Brazil Transactions of the Royal Society of Tropical Medicine and Hygiene 97, 153-158.

households with a cistern-flush toilet and those with a rudimentary pit latrine".

This thinking is reflected in the JMP classification of improved sanitation facilities, which includes a wide range of technologies, from simple dry pit latrines to flush latrines connected to sewer systems or septic tanks, all of which are deemed to be hygienic latrines.

Public finance should be utilized to increase the use of improved sanitation facilities (by everyone all of the time), yet the first step towards improved sanitation is to stop open defecation through a change in individual sanitation behavior. Therefore, effective sanitation finance should recognize that sanitation improvement involves a number of different steps over time, including initial behavior change, construction of a sanitation facility, adoption of improved sanitation behaviors, improvement of the sanitation facility, and safe disposal of wastes.

Therefore, while sanitation policies and strategies should aim for universal use of improved sanitation facilities, sanitation finance should be designed to promote and support the adoption of a range of sanitation behaviors, and a range of sanitation technologies that will change as individuals and communities become more familiar with improved sanitation behavior and more willing to invest in improved sanitation services. Importantly, the setting and financing of any minimum level of sanitation service should not preclude or prevent the construction of low-cost hygienic facilities, or constrain the development of innovative, local latrine designs.

MINIMUM BENEFIT LEVEL

The administrative cost associated with any benefit transfer system – for operation of the targeting, delivery and monitoring systems – limits the minimum effective size of the benefit. Significant economies of scale are available in the administration of national benefit programs, and additional economies are available from the use of existing targeting and financial systems. Nevertheless, the benefit level needs to be set high enough to justify the administrative expenditures.

It is also important that the benefit level is set high enough to have an impact on the beneficiaries' behavior and investment decisions. Conditional cash transfer (CCT) programs typically provide monthly benefit payments that range between 1 percent and 29 percent of pre-transfer household expenditures[26]. In Cambodia, this implies a CCT benefit level of between US$1 and US$20 per month, or as much as US$240 per household per year[27], which is higher than the transfer provided by most sanitation programs.

2.5 SERVICE DELIVERY

Service delivery systems need to be as efficient and accountable as possible in order to reduce administrative costs, provide cost-effective services, and avoid losses due to corruption or mismanagement.

In general, sanitation programs are implemented through non-private delivery systems, either through public agencies (including line ministries, local governments, and public extension workers) or through development partners (including donor-financed program management teams and non-government organizations). Very few of these organizations have experience or specialist skills in logistics, supply chain management, or local procurement systems; and, even where these skills and experience exist, the rigid conditions and procurement rules of government and its development partners often limit the use of informal service providers, locally-sourced materials, and local transport and delivery systems.

[26] Fizbein and Schady (2009) Conditional cash transfers: reducing present and future poverty The World Bank, Policy Research Report.
[27] Household expenditure data were unavailable, thus these calculations were based on an average per capita consumption by poor households in Cambodia of US$815 per year (adapted from CSES 2007 data, World Bank).

Many development programs use competitive bidding processes to procure local services, but these bidding processes are often circumvented or manipulated by contractors who are well connected with those managing the bidding process. Local service providers often lack the administrative skills to produce bidding documents that conform to the required standards.

In addition, management of the delivery system by highly paid professionals (such as consultants and NGO staff) and busy government officials often adds to the expense and complexity of the process. Their remuneration is not usually affected by the performance of the delivery system, or the quality of the service provided. In contrast, local supply chains are run by local manufacturers, transporters and retailers, whose pay and profits are determined by market rates, quality of the service provided, and the resultant demand for their goods and services.

As a result, few development programs are able to provide goods or services in low-income communities at prices anywhere near as low as those offered by local service providers. For instance, recent research by the IDE Cambodia sanitation marketing project (supported by WSP and USAID) found that local producers were willing to provide the basic below-ground materials for a pour-flush latrine, including ceramic latrine pan, concrete slab, three concrete rings, concrete pit cover, pipework and transport to nearby villages, for a total cost of only US$25. A similar package of latrine materials provided by private contractors through the ADB Tonle Sap Rural Water Supply and Sanitation Program (TS-RWSSP) cost an average of US$88 per latrine. While the IDE project involves the use of innovative design and fabrication techniques to reduce costs, previous latrine cost data[28] confirm that the ADB delivery system is several times more expensive than services available from local providers.

Therefore, wherever possible, sanitation programs should aim to deliver services through local markets rather than through parallel delivery systems. The intention is to reduce the costs of supply, to provide the user with a choice of service providers, to make the service provider accountable to the user of the services (rather than to the financier or project manager), and therefore to encourage competition and service improvements among suppliers and service providers.

BENEFIT SYSTEMS

The use of more market-based delivery systems for sanitation improvement implies the provision of purchasing power to the target population. The most common forms of providing this purchasing power are:

- Cash transfers and rebates
- Vouchers and fee waivers
- Microfinance

Cash transfers and rebates involve direct payments to target households, usually on verification of meeting any conditions attached to the payment, such as a rebate paid to poor households on construction and use of a household latrine. Ideally, these payments should be made through existing financial institutions such as banks and microfinance institutions, which have relatively efficient administrative systems, but this may not be possible in remote rural areas, or among households and individuals that lack formal identification or residency papers.

Branchless banking is increasingly popular as a way of delivering money and other financial services to people without bank accounts. Branchless banks use mobile phones, smart cards, debit cards and prepaid cards to transmit information between the agent, customer and the bank[29]. Initial efforts at branchless banking with mobile phones in Cambodia are reported to require the provision of a large number of documents for registration, which is likely to make it difficult for many households; and there remain many poor households that lack easy access to a mobile phone.

Cash distributions are often used in developing countries that lack reliable financial systems. Cash distributions are based on a list of beneficiaries, each of which presents some form of identification, signs the paperwork and receives the cash. In the Meket Project in Ethiopia, beneficiaries gather

[28] Salter D (2009) Sanitation demand and supply in Cambodia: identifying constraints to increasing sanitation coverage Phnom Penh: The World Bank, Water and Sanitation Program Field Note.
[29] Grosh M et al (2008) For protection and promotion: the design and implementation of effective safety nets Washington DC: The World Bank.

along the road or at the market on the day of payment. Names are called out in groups of ten and the first person in the group is given the list that all ten people sign, usually with a fingerprint (to solve the problem of illiteracy and limit duplicate collections through ink stain checks). The first person on the list also collects the money for everyone in that group, each beneficiary is informed of his or her transfer amount, and the cash is then distributed[30].

Vouchers and fee waivers involve program payments to service providers rather than to beneficiaries. Both approaches require some form of beneficiary identification (either a printed voucher or an ID card), accreditation and training of service providers, monitoring and payment systems. The advantage of these approaches is that they can be implemented alongside non-subsidized services with little disruption or distortion of the market for services. For instance, a voucher scheme could be run in parallel with a sanitation marketing project without undermining the demand for services, and can be used to direct customers towards accredited service providers.

There is a risk that a parallel market emerges if beneficiaries resell their vouchers at a discounted value; and service providers may attempt to charge a fee to redeem vouchers, or may overprice their goods, if there are any costs associated with the provision of the subsidized services. Therefore, it is important that the benefit system provides rapid and full redemption of any vouchers accepted by local service providers, and that some form of monitoring checks that the services purchased with the vouchers are delivered.

MICROFINANCE FOR SANITATION IMPROVEMENT

Micro-lending to poor households is often proposed as a solution to financing sanitation improvements in low-income communities. Yet there have been few large-scale examples of successful microfinance for sanitation improvement in rural areas.

A recent study by the Bill & Melinda Gates Foundation[31] reports that about 60 percent of households who built new toilets under the Total Sanitation Campaign (TSC) in Maharashtra took loans with an average size of US$30, which suggests some 640,000 loans totaling US$18 million were utilized for sanitation improvement. The same study reports half a million urban borrowers for sanitation improvements through the Vietnam Bank for Social Policy and the Vietnam Women's Union, with an average loan size of US$250 and cumulative loans now exceeding US$100 million.

Sanitation-related loans are almost always linked to a wider program of demand creation, and the effectiveness of the demand creation activities appears to be critical to the success of the sanitation microfinance initiative. The Maharashtra and Vietnam examples given above link to well-established programs and institutions with significant outreach capacity.

However, the majority of the sanitation loans were made to non-poor rural households, such as in Maharashtra where above-poverty-line households receive no government support for latrine construction, or to low-income urban house-

[30] Ibid.

[31] Mehta M (2008) Assessing microfinance for water and sanitation: exploring opportunities for sustainable scaling up Bill & Melinda Gates Foundation, Final Report http://www.gatesfoundation.org/learning/Pages/microfinance-for-water-and-sanitation.aspx.

holds that have the ability to make regular cash repayments. The Vietnam Women's Union (VWU) provides loans only to households with no other outstanding loan, no previous bad debt, and that are deemed able to pay back the loan. Applicants must also have an income above the provincial poverty line; thus, by definition, they are non-poor.

Despite innovations such as the social collateral approach[32] adopted by the Grameen Bank in Bangladesh, few microfinance institutions are willing to lend to very poor rural households, particularly for non-income generating investments such as sanitation facilities. Therefore, microfinance is likely to be most effective when used to finance sanitation facilities and improvements by non-poor households that do not qualify for sanitation subsidies or other sanitation-related benefits.

DEMAND CREATION

Most sanitation programs include a component for sanitation and hygiene promotion, which aims to generate demand for improved sanitation and encourage the sustained practice of improved sanitation and hygiene behaviors.

In the past, this component received a relatively low priority. The main thrust of sanitation programs, and the bulk of the finance, was to ensure the construction of new toilets, often through the provision of some form of subsidy to increase demand for sanitation and enable poor households to afford hygienic facilities.

More recently, approaches such as Community Led Total Sanitation (CLTS) have increased the focus on the demand creation component, arguing that behavior change is the most important and difficult achievement, and that regular and universal use of simple latrines will provide better outcomes than the implementation of more expensive subsidized facilities with relatively low usage rates.

However, recent evaluations of CLTS interventions in Cambodia[33], India[34] and Nigeria[35] confirm that the sustainability of behavior change, notably the problem of reversion to open defecation (even in previously declared open defecation free communities), remains a challenge. The evaluation findings suggest that CLTS interventions can result in low quality latrines, and that the limited durability of some of these latrines risks relatively rapid collapse and abandonment, particularly in tropical climates where heavy rainfall, high water tables and termite damage present significant challenges to low-cost building techniques.

In addition, the TARU impact assessment suggested that incentives for the achievement of open defecation free (ODF) communities, such as the Nirmal Gram Puraskar[36] (NGP) awards, can lead to short-term interventions, coercive approaches and temporary behavior change.

Critics of the CLTS approach suggest that these findings confirm that higher technical standards are needed; that more durable latrines will have lower operation and maintenance costs, and higher usage rates, thus will result in better long-term outcomes. Once again, it is being suggested that, in order to provide better quality latrines to poor households, some form of initial hardware subsidy will be required.

This interpretation ignores the reality of India's Total Sanitation Campaign, which already includes hardware subsidies and minimum technical standards. The TSC guidelines state that below-poverty-line (BPL) households should be provided with a financial incentive (currently set at INR 2,200[37], US$45) once they have built and started using an individual household latrine. In several states, these guidelines translate into the provision of up-front material packages to BPL households. In addition, the TSC guidelines prohibit the construction of dry pit latrines, hence all new

[32] Whereby loans are made to groups, with social capital and peer pressure utilized to minimize defaults as a default by any member of the group prevents the other members from qualifying for further loans.
[33] MRD (2009) Community-Led Total Sanitation in Cambodia: Formative evaluation report Ministry of Rural Development, Government of Cambodia, draft report.
[34] TARU (2008) Impact assessment of Nirmal Gram Puraskar awarded panchayats: final report UNICEF.
[35] Robinson A (2009) Sustainability and equity aspects of total sanitation programmes: a study of recent WaterAid-supported programmes in Nigeria London: WaterAid, Report.
[36] Clean Village Award provided to villages in India that meet a set of sanitation-related criteria that include verification of open defecation free status.
[37] Government of India, Ministry of Rural Development, Department of Drinking Water Supply Office Memorandum No. W-11037/6/2005-CRSP (Revision of the unit cost of IHHLs under the Total Sanitation Campaign) dated 21 October 2008.

latrines are pour-flush water-seal latrines, usually with a concrete slab either provided by the promoter or required to be in place before the incentive payment is made.

Despite the technical standards imposed by the TSC, the sustainability of latrine usage and behavior change remains problematic across many parts of India. In most cases, these problems relate to ineffective demand creation rather than to technical shortcomings or inadequate hardware subsidy. Therefore, it is critical that sanitation finance mechanisms are designed to address more than the provision of sanitation facilities, as demand creation, supply-side strengthening, capacity development, and outcome monitoring are all central to sustainable and effective sanitation improvement.

III. Conditional Cash Transfers

Conditional cash transfers (CCTs) are an increasingly popular mechanism for transferring benefits to target populations, generally poor households. A CCT is defined as a cash transfer that is conditional on the consumption of a particular good, usually pre-specified investments in the human capital of children. Most CCT programs make regular payments to poor mothers conditional on the use of health or education services by her child or children.

Countries have been adopting CCT programs at a prodigious rate[38]. Virtually every country in Latin America has a program and large-scale programs now operate in Bangladesh, Indonesia and Turkey, with pilot programs in Cambodia (CESSP scholarship program, see box earlier), Malawi, Morocco, Pakistan and South Africa.

CCTs have been hailed as a way of reducing inequality; of helping households break out of a vicious cycle whereby poverty is transmitted from one generation to another; and of promoting child health, nutrition and schooling.

3.1 RELEVANCE FOR SANITATION IMPROVEMENT

Under-nutrition and malnutrition remain significant problems in Cambodia, thus the Government of Cambodia has been discussing the introduction of a CCT program for nutrition with its development partners. A World Bank-supported seminar and workshop was held in Phnom Penh in October 2009, at which the potential for CCTs was discussed and plans for the development of large-scale programs were outlined.

While a relatively recent phenomenon, the CCT literature[39] contains a number of evaluations that highlight the success of CCT programs in improving the uptake of health and education services such as preventive health checkups, vaccinations, and school enrolment. However, the evidence that these gains result in improvements in final health and education outcomes is mixed, with some evaluations finding little or no improvement in malnutrition rates and others that learning outcomes were unchanged.

[38] Fizbein and Schady (2009) Conditional cash transfers: reducing present and future poverty The World Bank, Policy Research Report.
[39] Ibid.

Recent research has confirmed the long-held suspicion that inadequate sanitation plays a significant role in the nutritional status of children. The intuition that diarrheal disease caused by inadequate water supply and sanitation affects nutritional uptake, and that malnutrition in turn increases the relative risk of diarrheal disease, is supported by a recent collective expert opinion that about 50 percent of the consequences of malnutrition are caused by inadequate water and sanitation services and poor hygienic practices[40]. Repeated infections, especially diarrhea and helminthes, caused by poor environmental health lead to underweight (low weight for age) and stunted (low height for age) children, which, in turn, make these individuals more predisposed to infections and chronic diseases later in life.

Most nutrition programs include child growth monitoring, supplementary feeding, vaccinations and micronutrient addition, with CCTs targeted at young mothers with children and paid based on records of service use. Yet few nutrition programs include any components that promote improved sanitation and hygiene. The rapidly developing field of CCT nutrition programs provides an opportunity to address the current failure to link sanitation improvement and nutrition, through the potential for additional conditions that encourage the use of improved sanitation facilities and the achievement of collective sanitation outcomes.

3.2 FEATURES OF CCT PROGRAMS

ARGUMENTS FOR CONDITIONALITY

The attachment of conditions to cash transfers risks complicating the administration of the transfers, hence reducing the efficiency of the delivery system. The main arguments for conditionality are that the persistence of irrational behavior and imperfect information leads to excessive procrastination regarding household investments; conflicts of interest within the household (parent to child, and wife to husband); and private investment below the socially optimal level (notably due to unrecognized externalities). In addition, government policy is often affected by the political economy through lobbying, voting, bureaucracy, and interagency bargaining, which favor politically and publically acceptable conditions such as “good behavior”.

LEVEL OF BENEFIT

The transfer should compensate households for the opportunity cost of using the services required by the transfer conditions, subject to overall budget constraints. As noted earlier, the transfer should be targeted at the poorest for the best welfare-enhancing solution, and at households that cannot support themselves through work (so that the transfers do not discourage the labor supply or crowd out private investments in human capital).

CCTs IN PRACTICE

CCT systems need to demonstrate that the targeting is more effective than alternative systems; the delivery system is more efficient; and the outcomes are more beneficial. Therefore, most CCT programs involve the use or establishment of a national means testing system; transfer delivery through banks, mobile phones or reliable local institutions; and multiple monitoring and redress systems.

SUPPLY OF SERVICES

The CCT literature also recognizes that CCTs alone are not enough to change behavior or improve outcomes. Most CCT programs also incorporate promotional and outreach components designed to encourage investments in human capital; and, in contexts of low capacity and poor governance, supply strengthening components are needed to make sure that the necessary services are available to the poor households targeted by CCT programs.

[40] Prüss-Üstün and Corvalan (2006) in World Bank (2008) Environmental health and child survival: epidemiology, economics, experiences Washington DC, The World Bank.

These elements are a good match for sanitation programs, which generally include sanitation promotion components to build demand and supply-side strengthening to improve the supply and affordability of sanitation goods and services.

One important difference in CCT programs is that the supply of services needs to be carefully monitored to ensure that transfers are not withheld as a result of inadequate service provision (resulting in difficulty in utilizing the services).

3.3 CCTs FOR SANITATION IMPROVEMENT

Discussions with social protection experts in Cambodia suggest that there is likely to be little demand or interest in separate CCTs for sanitation improvement, but that there is potential for the inclusion of conditions linked to sanitation, perhaps through the inclusion of a top-up payment conditional on sanitation behavior.

Given current low sanitation coverage and weak sanitation markets, any CCT sanitation condition would have to be linked to large-scale programs designed to strengthen and improve the supply of sanitation goods and services, and promote improved sanitation behavior.

Most health and education CCT programs require monitoring of service use at the service provider level: at health clinics, and in schools. A key drawback of a sanitation condition is the requirement for household-level monitoring, which would greatly increase the number of service points that need to be monitored. However, use of sanitation services could be monitored on a less frequent basis than health or education services, which would partially offset the household-level monitoring requirement.

The National Community Empowerment Program (PNPM Mandiri) in Indonesia includes a community cash transfer scheme (PNPM Generasi) that provides annual block grants to rural communities, with top-ups conditional on the provision of basic health and education services and the achievement of specific outcome targets. WSP Indonesia has proposed the inclusion of an additional top-up grant conditional on the achievement and verification of open defecation free (ODF) status in the community. This modification is still being debated in Indonesia, but provides a useful model for consideration in Cambodia.

IV. Cambodia Case Studies

Four case studies were completed as part of the research for this study. The first two were detailed case studies of programs that had been running for three years (as of 2009 where the study was undertaken), using preliminary household survey data collected by the WSP Economics of Sanitation Initiative (ESI) Phase 2 study:

- ADB Tonle Sap Rural Water Supply and Sanitation Project (ADB TS-RWSSP);
- Plan Cambodia CLTS program.

The other two case studies were partial assessments of sanitation marketing interventions[41]:

- IDE sanitation marketing project;
- WTO and LienAid sanitation marketing project.

The information on the case studies was drawn from ESI household surveys (where available), interviews with program managers and technical advisers, data provided by the implementing organizations, and analysis conducted by the author.

The template developed for the six-case study WSP sanitation financing study was utilized for the case study analysis in order to allow ready comparability between the Cambodia case studies and other WSP case studies on sanitation finance.

4.1 ADB TONLE SAP RWSSP

Launched in 2006, the US$18 million ADB Tonle Sap Rural Water Supply and Sanitation Program (TS-RWSSP) aims to provide rural water supply and sanitation facilities to 1.09 million people in 1,760 villages in the five provinces that surround the Tonle Sap lake. Sub-project selection combines elements of poverty targeting with a demand-responsive approach intended to improve the sustainability of project facilities.

[41] At the time of the study in late 2009, these sanitation marketing programs were just recently launched.

TABLE 4.1 ADB TS-RWSSP SANITATION OPTIONS

Latrine type	2005 Cost estimate	2007 Cost estimate	Project subsidy	HH cost	No. latrines planned
Pour-flush latrine	US$50	US$120	40%	US$72	79,201
Water seal latrine	US$35	US$100	60%	US$40	26,110
VIP latrine	US$35	US$65	60%	US$26	17,407
Dry pit latrine	US$20	US$50	90%	US$5	24,370
Disabled latrine	US$60	US$120	80%	US$24	2,031
				Total	**149,119**

HH = Household; VIP = Ventilated Improved Pit

The TS-RWSSP is the largest rural sanitation program in Cambodia, with an estimated US$5.1 million spent on the sanitation component over the last three years. The project area includes 3.42 million people, who comprise 25 percent of the total population of Cambodia. The project villages will include roughly one in four of all villages within the five provinces, thus the project aims to make a substantial impact on quality of life and environmental health within these provinces.

The baseline survey conducted at the start of the project indicated 11 percent sanitation coverage within the project area, which compares with an average of 20 percent in rural Cambodia[42]. The project sanitation goal was to build 150,000 household latrines by 2011, which would increase sanitation coverage across the five provinces by about 21 percent.

SANITATION OPTIONS

The TS-RWSSP promotes four types of household sanitation facility:

- Pour-flush latrine (water-seal pan with offset latrine pit)
- Water-seal latrine (water-seal pan with direct latrine pit)
- VIP latrine (ventilated improved pit latrine with direct latrine pit)
- Dry pit latrine (dry pit latrine with direct latrine pit)

The planned project sanitation options and subsidy levels are set out in Table 4.1. In practice, it proved difficult to maintain the theoretical subsidy levels outlined in the project preparation documents, as latrine costs have increased dramatically since the project inception. Several revisions were made to the standard latrine designs utilized by the project in a bid to maintain the proposed subsidy levels and minimize costs. In addition, a form of community contracting was introduced in mid-2009, whereby the provincial rural development office calls for bids from local contractors for each community sub-project, but allows the community to select the preferred contractor.

Unfortunately, rising unit costs have resulted in the premature expenditure of the sanitation budget. The progress report (dated 30 September 2009) suggested that 37,115 household latrines have been completed, with a further 5,870 contracted but not yet complete (making a total of 42,985 contracted latrines). However, expenditure in the "civil works – household latrine" category (31 August 2009) is already at US$2.77 million, exceeding the US$2.38 million budget by 16 percent.

The project team has applied for a major change in project scope in order to reallocate funds from other project areas (notably contingencies, consultant fees, civil works for public latrines and NGO contracts). The majority (61 percent) of the US$2.37 million budget adjustment has been proposed for reallocation to the household latrine budget. ADB financial records reveal that the contracted amount for household latrines is already at US$3.45 million (although only US$2.20 million has been disbursed), thus the contracted amount is already 45 percent higher than the original allocation but only 46,000 of the planned 150,000 latrines will be completed.

[42] NIS (2009) Cambodia Socio-Economic Survey: Housing conditions 2007 Phnom Penh: Ministry of Planning, National Institute of Statistics, Report.

It is clear from the financial data that the average cost of the household latrines has been significantly higher than expected during the design of the project. The original budget for household latrines implied an average "civil works" cost (ADB share) of about US$16 per latrine. In practice, the contracted civil works amount (ADB share) has reached an average of about US$80 per latrine – five times higher than anticipated.

In addition, contract data examined during the project implementation unit (PIU) visits in Siem Reap and Kampong Thom provinces suggest that the average contracted cost of a household latrine reached as high as US$135 – US$140 in 2009 (using community contracting, which was expected to lower the cost and limit procurement problems), which suggests an ADB share of about US$126[43].

The TS-RWSSP consultant team reports that significant increases in construction material and fuel prices during 2006-08 resulted in a dramatic rise in unit costs. It was also noted that the standard designs for pour-flush pit latrines (both offset and direct) were modified in 2008 to allow the use of timber or GI sheet for the walls of the latrine enclosure, in order to reduce costs from the previous design wherein all pour-flush latrines had plastered brick walls build by the contractor.

The latrine policy revisions reflect a more pragmatic approach. The original project design involved set percentages for project and household contributions to each household latrine model, which were intended to limit the external subsidy for the more expensive models. In practice, this approach resulted in perverse incentives, for example to retain expensive superstructure specifications in order to give the appearance of a lower project subsidy (by proportion), which ultimately raised the level of household contribution beyond that affordable to most rural households.

USER CONTRIBUTIONS FOR HOUSEHOLD LATRINES

The original project design envisaged that rural households would contribute between 10 percent and 60 percent of the cost of the latrines, depending on the latrine and superstructure design favored by the household – with the basic below ground components of the latrine (concrete rings and latrine slab) provided by the project, and the higher user contribution being demanded for more expensive pour-flush latrines with higher quality enclosures.

In practice, the TS-RWSSP employs a contractor to build the latrines. For pour-flush latrines, the contractor builds the entire latrine, leaving the household responsible only for digging the pit and paying the contractor for its share of the latrine cost. During the review visits, beneficiary households reported that the minimum household contribution for a pour-flush latrine was about US$80; and that the minimum contribution for a dry pit latrine was about US$10 (although some households contributed more in order to build a better latrine enclosure).

Expenditure data collected by the WSP ESI project suggest that typical user contributions per ADB pour-flush latrine are as follows[44]:

Cash contribution	= US$90
In-kind materials	= US$46
Labor	= US$1
Total household	**= US$137**

[43] 10 percent of the civil works cost of household latrines is covered by the Government of Cambodia.
[44] In-kind materials valued by the respondent households; hours of labor estimated by respondent households and valued based on average rural wage rate of KHR 928 per hour (and a shadow wage rate factor of 0.30).

No ESI data were available for household contributions to dry pit latrines in ADB project villages, but similar cost data from other programs (in-kind materials and labor) suggest that the average household cost for a dry pit latrine (under the ADB program) might be as high as US$48 per latrine (US$10 cash + US$37 in-kind + US$1 labor).

Interestingly, both villagers and PIU staff reported that many households that had obtained dry pit latrines from the ADB project had subsequently upgraded the latrines to pour-flush latrines (usually costing a minimum of US$10 for the pour-flush pan and pipework, with higher upgrade costs if converted to an offset pour-flush latrine).

The consistent message from the PIUs, project consultants and village committee members was that villagers prefer pour-flush latrines. It was suggested that dry pit latrines were smelly and unpleasant, and that the wood ash essential for stopping odors was unavailable in many places. This suggestion appeared to be borne out by recent community contracts for latrines, which were 100 percent pour-flush latrines.

However, it remains unclear whether this message is evidence-based, or is a discourse promoted by the project staff and by the community members that have benefited from project assistance[45].

For instance, 27 percent of all latrines completed by the project have been dry pit latrines, suggesting that there is demand for these simple latrines (perhaps because of the much lower household contribution required). In addition, a larger than average proportion of dry latrines were reported in the few villages that have achieved 100 percent sanitation coverage. Finally, CLTS interventions across Cambodia have demonstrated that many rural people are willing to build simple dry pit latrines, providing the financial cost is relatively low. Questions have been raised regarding the durability of these simple dry latrines, particularly in areas that face high water tables and regular flooding, but there seems clear evidence of initial demand for these low-cost latrines if the household contribution is affordable.

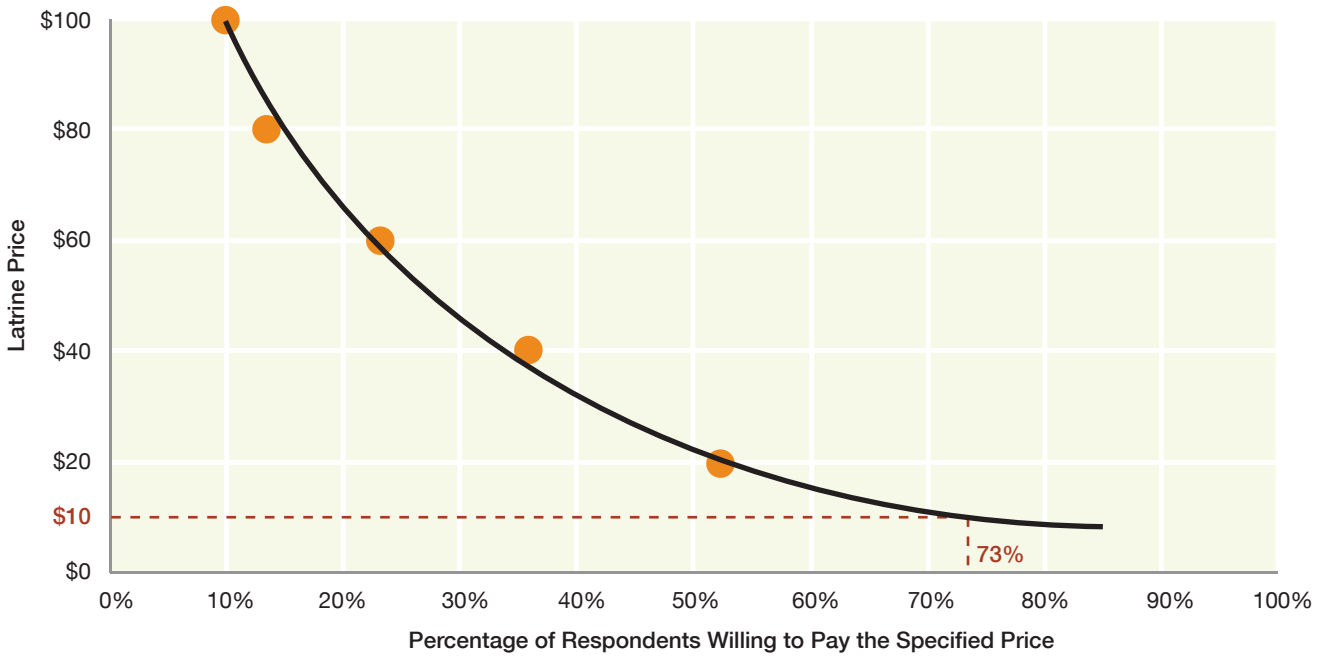
ADB: TARGETING

In 2007, data collected by the WSP-IDE sanitation demand assessment study suggested that 73 percent of rural households (that do not own a latrine) were willing to pay US$10 for a pit latrine. The same data suggest that just over 40 percent were willing to pay US$30 for a pit latrine (the cost of the "latrine core" promoted by the IDE sanitation marketing program since 2009); and that only 15 percent would be willing to pay the US$80 contribution demanded by the ADB TS-RWSSP.

One of the problems reported by the consultants and promoters of the TS-RWSSP has been that they have struggled to create demand for the latrines. Several practitioners noted that demand has developed slowly, with only 20 or 30 households willing to invest initially, although this number grows as people see the latrines constructed and used, and begin to appreciate their benefits.

[45] Cambodia DHS (2000) reported that 98.6 percent of rural households used either firewood, straw or charcoal as cooking fuel, which suggests that wood ash is rarely unavailable in rural areas. In addition, the UNICEF-MRD evaluation of CLTS projects in Cambodia (2009) found that "dry latrines are suitable – when they are used and maintained properly they do not cause bad smell".

FIGURE 4.1 WILLINGNESS TO PAY FOR A LATRINE (BY RURAL HOUSEHOLDS THAT DO NOT OWN A LATRINE)



Source: Roberts and Long (2007) *Demand assessment for sanitary latrines in rural and urban areas of Cambodia* Phnom Penh: IDE and WSP.

The program data discussed earlier suggest that 20 percent of the households in the ADB project villages have invested in new latrines, of which 73 percent had built the more expensive pour-flush latrines and 27 percent had built dry latrines. The project expenditure data imply that three-quarters of the sanitation investment went on pour-flush latrines, all of which were built by non-poor households that could afford the US$80 cash contribution[46]; while at most half of those that built dry latrines are likely to be poor households (as the investments made in building latrine superstructures indicate that the majority were non-poor households). Therefore, only about 10 percent of the sanitation investment has reached those below the poverty line; the remaining 90 percent has benefited non-poor households that took advantage of the generous subsidies offered by the ADB TS-RWSSP.

Furthermore, these data illustrate that relatively few people were willing to invest in these facilities: only about 15 percent (0.73 x 0.20) of the target population invested in a pour-flush latrine, even in the knowledge that they stood to gain a similar amount from the project contributions in materials and skilled labor; and less than 6 percent invested in dry pit latrines, despite the much lower entry requirements.

The headcount poverty level in the project area averages about 35 percent, and the ADB design documents for the second phase of the TS-RWSSP note that the selection process for target villages should result in a higher proportion of poverty in the selected low-income communities, with perhaps 50 percent of the target village population being below the poverty line. The IDE willingness-to-pay data suggest that these poor households (the bottom third) would be willing to pay around US$12 for a latrine. These data reinforce the suspicion that the ADB latrine options and cost sharing rules required too high a contribution for poor households to benefit from the project.

Another targeting weakness relates to the location of the project villages. The maps provided by the PIUs in Siem Reap and Kampong Thom highlighted the clustering of the project villages along or close to the main road and its feeder roads. Very few project villages were located in more

[46] World Bank adjusted data (based on CSES 2007) suggests US$815 annual consumption by poor households in rural areas of Cambodia.

remote rural areas, despite awareness that the highest poverty and lowest service coverage are usually found in remote rural areas.

The PIUs noted that, while a number of poverty and WASH service criteria are examined in the selection of communities, the determining factor is often accessibility by road, which is required in order for drilling rigs and contractor's vehicles to access the villages to construct water supplies and deliver materials.

ADB: LATRINE USAGE

Both the review and the ESI household data suggest that the use of ADB-subsidized latrines is high in the ADB project villages. Despite concerns that subsidy-based programs often result in low ownership, limited behavior change, and low latrine usage, the requirement for substantial household contributions appears to have ensured that only households that are genuinely interested in latrine ownership (and can afford the household contribution) have participated in the program.

The ESI household survey respondents were selected through a purposive sample, which selected only pour-flush latrine users and open defecators in the three ADB project villages surveyed. As a result, the ESI survey data are not representative of the communities from which the households were sampled, and careful analysis is required to interpret the relevance of the data regarding program outcomes.

In total, 250 households from four villages were surveyed, of which 50 were households practicing open defecation selected from a non-ADB control village. The 200 households surveyed in the three ADB project villages included 124 households that owned pour-flush latrines, and 76 households without latrines.

The households survey data revealed that 42 of the 124 households (34 percent) that owned latrines had built them without any external assistance. Therefore, only 82 of the 250 households surveyed had latrines built with ADB support. Among these households, 94 percent reported that they had "used the latrine yesterday", and only one latrine-owning household reported that they practiced regular open defecation.

ADB: OPEN DEFECATION

As noted earlier, open defecation remains a serious problem in the project villages. On average, the open defecation rate across all of the project villages was 69 percent, which means that about 748,000 people have no latrine and regularly practice open defecation (producing 112 tons of excreta daily across the 957 project villages).

TABLE 4.2: ESI HOUSEHOLD SURVEY IN THE ADB TS-RWSSP VILLAGES

Household type	Survey No.	Total No. latrines	Survey %
Pour-flush latrine (program)	82	179	46%
Pour-flush latrine (self-supply)	42	60	70%
Dry latrines	-	17	0%
No latrine (program)	76	259	29%
Total project households	**200**	**515**	**39%**
No latrine (control village)	50	-	

Source: raw survey data provided by EIC (consultant that undertook the household survey)

In Siem Reap province, the ADB monitoring data suggest that 18 project villages (9 percent) have achieved 100 percent latrine coverage. The proportion of dry pit latrines provided in these villages appeared to be higher than in the other villages, confirming findings from other sanitation projects that the promotion of low-cost latrines is essential for the achievement of ODF communities.

No data were available on latrine usage and sustainability rates in these 100 percent covered communities, but the coverage figures appear a commendable achievement given starting sanitation coverage of only 2.3 percent. However, this achievement needs to be balanced against data showing that 30 of the project villages (16 percent) had achieved less than 10 percent sanitation coverage to date, despite receiving some form of water supply intervention and user group training on improved sanitation and hygiene.

Given this high level of open defecation, and concerns over the targeting of subsidies at non-poor households, it seems unlikely that the project sanitation investments will have achieved the intended health, economic, social or educational benefits.

ADB: SANITATION PROJECT COSTS

A preliminary analysis of the sanitation project costs[47] was undertaken to assess the total cost of the latrines provided through the ADB TS-RWSSP. This analysis involved examining the expenditure headings under the project, and allocating the costs to either water supply or sanitation activities (on the basis of advice from the consultant team).

The analysis suggested that the following average costs are linked to the project sanitation development activities:

Contracted civil works	= US$88 per latrine
Software (hygiene promotion, training)	= US$16 per latrine
Program costs (management, technical assistance)	= US$42 per latrine
Average project sanitation cost	**= US$146 per latrine**
Household contribution (cash and in-kind)	= US$120 per latrine[48]
Average latrine cost	**= US$266 per latrine[49]**

This preliminary cost analysis confirms that the TS-RWSSP is an expensive service delivery mechanism. The provision of program services and contracted civil works through government departments and project implementation units appears more costly than the delivery of these services through market-based mechanisms, such as through user households purchasing similar materials and services from private retailers and service providers.

The sanitation marketing programs currently being implemented by IDE Cambodia (with support from WSP and USAID) and LienAid-WTO are promoting the sale of US$30 low-cost latrine packages by local concrete producers, with each package including three concrete rings, a concrete latrine slab, a proprietary concrete pan stand, and a ceramic latrine pan. Local producers are willing to waive the charge for delivery of these packages to nearby villages (within about 10 km), providing that several orders can be filled in each trip.

Direct comparisons between the latrine costs in the nascent sanitation marketing programs and those over the last three years of the ADB TS-RWSSP are difficult, both because the sanitation marketing costs do not include any allowance for the construction of the latrine or for the supply of the superstructure materials; and because prices have changed significantly over this period[50].

Nevertheless, the ADB's Second Rural Water Supply and Sanitation Sector Project proposes that "a sanitation grant will be provided to each household, covering the cost of an improved and hygienic dry pit latrine with a concrete ring-lined pit (sub-ground structure only)"[51]. The proposed project intends to undertake six months of behavior change and triggering activities in project communities before providing household sanitation grants of US $75 for the construction of an improved dry pit latrine, based on the following costs:

Labor to excavate the pit (household)	US$15
Materials for the four rings (project)	US$44
Materials for the cement slab (project)	US$12
Construction costs (project)	US$13
Supervision costs (project)	US$5
Materials for superstructure (household)	US$26
Total investment	**US$115**

[47] In all cases, the sanitation project costs included all costs available from the project information systems, including direct implementation costs (software, hardware, salaries, allowances, program management and support) and indirect support costs (staff training, travel, research and development).
[48] Average household contribution in the ESI survey households (including cash, in-kind materials and labor valuation) was estimated to be US$137 for pour-flush latrines; author's estimate of household contribution for dry pit latrines is US$48.
[49] Average cost per "latrine in use" (assuming 94 percent usage) across all latrine types, including cheaper dry pit and VIP latrines.
[50] Material prices have risen significantly, thus the average ADB latrine costs are likely to underestimate the current cost of latrine provision through the program.
[51] ADB (2009) Proposed Asian Development Fund Grant – Kingdom of Cambodia: Second Rural Water Supply and Sanitation Sector Project: Report and recommendation of the President to the Board of Directors.

BOX 2. LATRINES COSTS IN CAMBODIA

A key element of the cost of household latrines under both the ADB and IDE sanitation programs is the cost of the concrete rings used to line the latrine pit. Material and production costs appear to vary dramatically across Cambodia, being lower close to Phnom Penh and international border crossings, and higher in remote rural areas. Recent inflation in material prices also makes it difficult to compare prices with any consistency.

The following tables summarize regional cost data on precast concrete rings, with allowance for inflation until 2012 (based on CPI inflation of 7.3 percent in February 2010):

TABLE 4.3 COST PER 100-CM PRECAST CONCRETE RING, IN US$

Province	2006 prices (IDE)	2010 prices (ADB)
Kandal	3.00	
Svay Rieng	4.50	
Siem Reap	6.00	10.00

TABLE 4.4 RELATIVE PROGRAM PRICES FOR CONCRETE RINGS, IN US$

Sanitation Program	2006 prices	2009 prices	2012 prices
IDE (Svay Rieng improved)	-	3.00	3.71
IDE (Svay Rieng normal)	4.50	7.50	9.26
ADB (Siem Reap)	6.00	10.00	12.35

TABLE 4.5 DRY LATRINE COSTS, IN US$ (2009 PRICES)

Latrine component	IDE core	Svay Rieng	Siem Reap
4 x concrete rings	12.00	30	40
Concrete slab	1.50	5	8
Total (excluding labor)	13.50	35	48
Total (at 2012 prices)	17.00	43	59

The cost data illustrate the dramatic price inflation that occurred between 2006 and 2009, with recent cost data from Siem Reap suggesting that prices have risen by more than 60 percent over the last 3-4 years. These data also point to large price variations across the country, with the IDE survey in 2006 finding that concrete rings in Siem Reap province were twice as expensive as rings in Kandal province; and the dry latrine cost estimates suggesting that similar components are 37 percent more expensive in Siem Reap than in Svay Rieng province. Finally, the dry latrine cost estimates highlight the significant impact that the reduced concrete production costs predicted by the IDE program could have on overall latrine costs, with the forecast costs amounting to only 40 percent of conventional production costs.

The ADB cost estimate suggests that the project latrine cost in the second phase will be US$74 (64 percent), with the remaining US$41 provided by the household in labor and materials. This project amount includes US$18 for construction and supervision costs, thus the total for the latrine materials provided by the project is estimated at US$56. The IDE sanitation marketing program estimates the cost of the materials for a similar latrine package (dry latrine with four rings) at around US$20, including transport and 20 percent producer profit. The IDE program has made efforts to improve the design and reduce the cost of the latrine materials, and the IDE latrine costs can thus not be taken to represent the current market rate. However, the spread between the ADB and IDE latrine costs suggest that the ADB project costing is considerably higher than the current market rate.

UPGRADING DRY PIT LATRINES

The ADB decision to provide only dry latrine packages in the second phase of the project reflects the learning from the first phase, and appears a positive step towards making the project more pro-poor. The intention is to provide these dry latrine materials as a starter pack, with support and promotion provided to encourage those that can afford the upgrade to use these materials to construct pour-flush latrines.

The design criteria and cost sharing rules adopted in the first phase meant that the dry latrine model incurred a project cost that was similar to that for the pour-flush latrine model: US$92 average cost for dry pit and VIP latrines compared with US$108 average cost for pour-flush and water-seal latrines. However, the household costs were very different: US$10 for the dry pit latrine compared with a minimum of US$80 for the pour-flush latrine.

As noted earlier, despite comments by project staff that dry latrines were not a good sanitation solution, approximately 27 percent of the project latrines implemented to date have been dry pit latrines. The relatively high proportion, given limited promotion by project staff, reflects the greater affordability of the dry pit latrine model.

The field visits undertaken in Cambodia confirmed that many of the dry pit latrines implemented by the project, which required only US$10 cash contribution from the household, had subsequently been converted to pour-flush latrines through the addition of a water-seal latrine pan and, in some cases, the relocation of the latrine pit in order to provide an offset pit (presumably for easier emptying).

Given that the conversion from dry pit latrine to pour-flush latrine was reported to cost as little as US$10, this approach seems a sensible and rational one: a US$20 cash investment then secures a functional pour-flush latrine. The only significant difference visible between the converted pour-flush latrines and the project pour-flush latrines was the quality of the superstructure – the US$80 household contribution secured a brick built and plastered latrine enclosure, while the cheaper converted models used a variety of local materials for the latrine enclosure (corrugated metal sheets, thatch, wood).

The ADB's Second Rural Water Supply and Sanitation Sector Project, proposes to provide dry pit latrine packages, builds on this approach by subsidizing a relatively low level of service, thus encouraging self-selection by poor households, with an easy and low-cost upgrade route to a pour-flush latrine. As noted earlier, there is little need to subsidize water-seal latrine pans because demand for these pans is high and, therefore, those that can afford them are likely to purchase and install them through the market.

An important consideration under this approach is the process for emptying or replacing full latrine pits. Most direct pit latrines – in which the squatting platform is placed directly above the pit – have relatively low-cost and easy to move enclosures, so that the platform and enclosure can either be moved above a new pit or disassembled while the pit is emptied. Where the enclosure is more permanent, or more difficult to move, there is a significant advantage in locating an offset latrine pit so that a second pit can be easily added when the first becomes full, thus avoiding the health risks associated with emptying latrine pits that contain fresh excreta.

Sanitation programs that encourage a range of latrine options and upgrades, and provide significant freedom and choice to the latrine user, must ensure that both the promotion teams and the users understand the importance of designing for safe pit emptying, or for the addition of a second pit, and the potentially costly or harmful implications of inadequately thought out latrine layouts and construction.

4.2 PLAN CAMBODIA CLTS PROGRAM

The Plan Cambodia Community Led Total Sanitation (CLTS) program was initiated as a pilot project in two villages in 2006. Since then, the program has expanded to cover another 45 villages with a total expenditure of just under US$0.5 million during the last two years.

The Plan CLTS program targets poor villages with low sanitation coverage and an absence of previous sanitation projects. The baseline data from the project villages indicate pre-intervention sanitation coverage of only 2 percent. The Plan interventions aim to achieve open defecation free communities where 100 percent of the population use sanitation facilities.

TABLE 4.6: ESI HOUSEHOLD SURVEY IN THE PLAN CLTS VILLAGES[52]

Household type	Total survey No.	Survey HH in 3 villages	No. latrines in 3 villages	Survey %
Pour-flush latrine (self-supply)	1	1	1	100%
Dry latrines (operational)	80	20	154	13%
Dry latrines (non-operational)	85	85	85	100%
No latrine	29	29	40	73%
Total project households	**195**	**135**	**280**	**39%**
No latrine (control village)	50	-	-	-

Source: raw survey data provided by EIC (consultant that undertook the household survey)

Like most CLTS programs, no hardware subsidy is provided to households that build sanitation facilities in the program villages. The Plan support involves only sanitation and hygiene promotion, community development, capacity building, and monitoring.

PLAN: TECHNICAL OPTIONS

The ESI household survey, which covered 245 households (including 50 households from a non-program control village), purposively sampled operational pit latrines, non-operational pit latrines and households with no latrine. While the total numbers of operational and non-operational latrines in the survey villages were unavailable, it appears from the data that almost all of the non-operational latrines were surveyed, and only 13 percent of the operational latrines were surveyed. As a result, the overall findings are not representative of the community-level sanitation outcomes.

All but one of the 165 latrine-owning households surveyed[53] had built simple dry pit latrines with wooden or earth-covered platforms directly above unlined latrine pits, thatched walls and thatched roofs. Eighty-six percent of the household latrines had been built without external assistance, with only 18 households reporting external or community support in the construction of their latrine.

PLAN: LATRINE USAGE AND OPEN DEFECATION

The Plan program monitoring data report that at least 16 of the 47 program villages have been declared ODF, which suggests a 34 percent ODF success rate. Sanitation coverage across the program villages averages 65 percent, which represents a 63 percent increase on the baseline coverage.

The ESI household survey data do not report the proportion of these latrines that were found to be improved sanitation facilities as per the JMP definitions, but it seems likely that some proportion of the simple pit latrines found in these villages were not "easy to clean", raised above ground level, or supported on all sides[54].

Latrine usage is estimated at only 64 percent based on the number of non-operational latrines reported in the ESI survey villages. This suggests that about 41 percent of the project population are using their latrines, with another 23 percent having abandoned their latrines, and the remaining 35 percent with no latrines.

The recent MRD CLTS evaluation in Cambodia[55] found that a similar proportion of CLTS latrines had been abandoned during the rainy season due to flooding or collapse. However, the MRD evaluation also reported that most of the people that had abandoned their latrines were practicing "dig and bury" techniques during the rainy season and planned to return to latrine use once the rains were finished and they were able to clean and repair their latrines.

PLAN: LATRINE COSTS

More than two-thirds of the latrine-owning households (71 percent) reported that they had not used any cash in the construction of the latrine. These households estimated that

[52] Population data were available for only three of the five survey villages.
[53] 80 households with operational dry latrines; 85 households with non-operational dry latrines.
[54] These criteria are part of the JMP classification of a pit latrine with slab.
[55] MRD (2009) *Community-Led Total Sanitation in Cambodia*: Formative evaluation report Ministry of Rural Development, Government of Cambodia, draft report.

the local materials they had used in the latrine construction were worth about US$10, and that they had invested an average of 13 hours of self-supplied labor, which was valued at US$1[56]. Therefore, the total latrine cost was valued at only US$11 including all labor and in-kind materials.

The remaining 41 households with self-built toilets reported an average cash expenditure of US$6 on top of similar in-kind material and labor contributions, making a total cost of US$17. Therefore, the average amount spent on a latrine in the Plan households surveyed was less than 10 percent of the amount spent on the ADB latrines.

PLAN: PROGRAM COSTS

A preliminary analysis of the sanitation program costs was undertaken to assess the total cost – including program support and software costs – of the latrines that resulted from the Plan CLTS program. This analysis involved examining the expenditure headings and amounts in the Plan Cambodia financial system and allocating the costs to either water supply or sanitation activities on the basis of advice from the Plan Water and Environmental Sanitation (WES) adviser.

The analysis suggested that the following average costs are linked to the program sanitation development activities:

Software (hygiene promotion, training)	= US$48 per latrine
Program costs (management, technical assistance)	= US$40 per latrine
Average project sanitation cost	**= US$88 per latrine**
Household contribution (cash and in-kind)	= US$19 per latrine
Average latrine cost	**= US$107 per latrine[57]**

This preliminary cost analysis suggests that the Plan CLTS program is an expensive approach, especially when contrasted with other reports that CLTS software costs in other programs in Cambodia are now as low as US$10 per household. However, it should be noted that the costs reported above are per "latrine in use" thus are increased by the low latrine usage figures estimated from the ESI household survey data[58]. Therefore, it is recommended that Plan Cambodia conduct a thorough survey to establish whether latrine usage rates are as low as the 64 percent suggested by the ESI data.

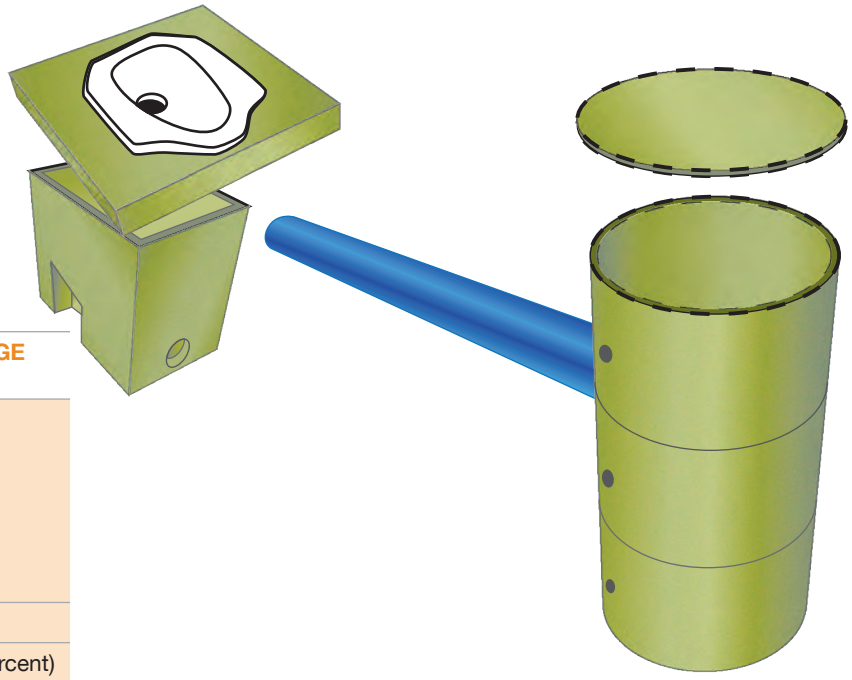
4.3 IDE SANITATION MARKETING PROGRAM

Implementation of the IDE sanitation marketing program began in September 2009 following several months of research and development. The program is supported by both WSP and USAID with a combined budget of US$760,000 over a 21-month period.

The program target is to sell 10,000 household latrines in two provinces using a market-based approach with no sanitation hardware subsidy. The R&D work enabled IDE to identify strong demand for a package of latrine components that enables rural households to build their own pour-flush latrine, including a basic enclosure, for as little as US$30. While the original intention was to develop a latrine model at around the US$10 price level, in order to be affordable for a substantial number of poor households, the human-centered design process led by IDE concludes that few Cambodians are willing to pay for anything less than a pour-flush latrine, and that most villagers would prefer to buy an affordable pour-flush latrine at the outset rather than build a cheaper model and upgrade it in several stages.

[56] Guy Hutton (ESI consultant) advised that a shadow wage labor rate of 30 percent was appropriate in rural Cambodia.
[57] Average cost per "latrine in use" (assuming 94 percent usage) across all latrine types, including cheaper dry pit and VIP latrines.
[58] Cost (including non-operational latrines) is US$72 per latrine.

FIGURE 4.2: LATRINE CORE: US$25 LATRINE PACKAGE (EXCLUDING ENCLOSURE COST)



LATRINE CORE: US$25 LATRINE PACKAGE (EXCLUDING ENCLOSURE COST)

Slab + ceramic pan	US$7.20
"Pan stand"	US$1.20
Pit cover slab	US$1.20
Concrete ring X 3	US$5.70
Plastic pipe	US$1.90
Labor	US$1.90
Transport	US$0.60
Total cost	**US$20.50**
Profit for producer	US$4.50 (22 percent)

As a result, IDE invested in the development of a "latrine core" that can be readily manufactured by local producers and easily transported to nearby villages. IDE also field tested several different approaches for developing private demand for latrine purchases, with the conclusion that the CLTS approach was the most cost-effective method of generating sanitation demand. The original program budget included a large mass media component for sanitation promotion, but after the field testing IDE decided to utilize these funds to hire teams of sanitation promoters that would be used to implement an adapted CLTS approach as a precursor to the latrine marketing effort made by trained local producers.

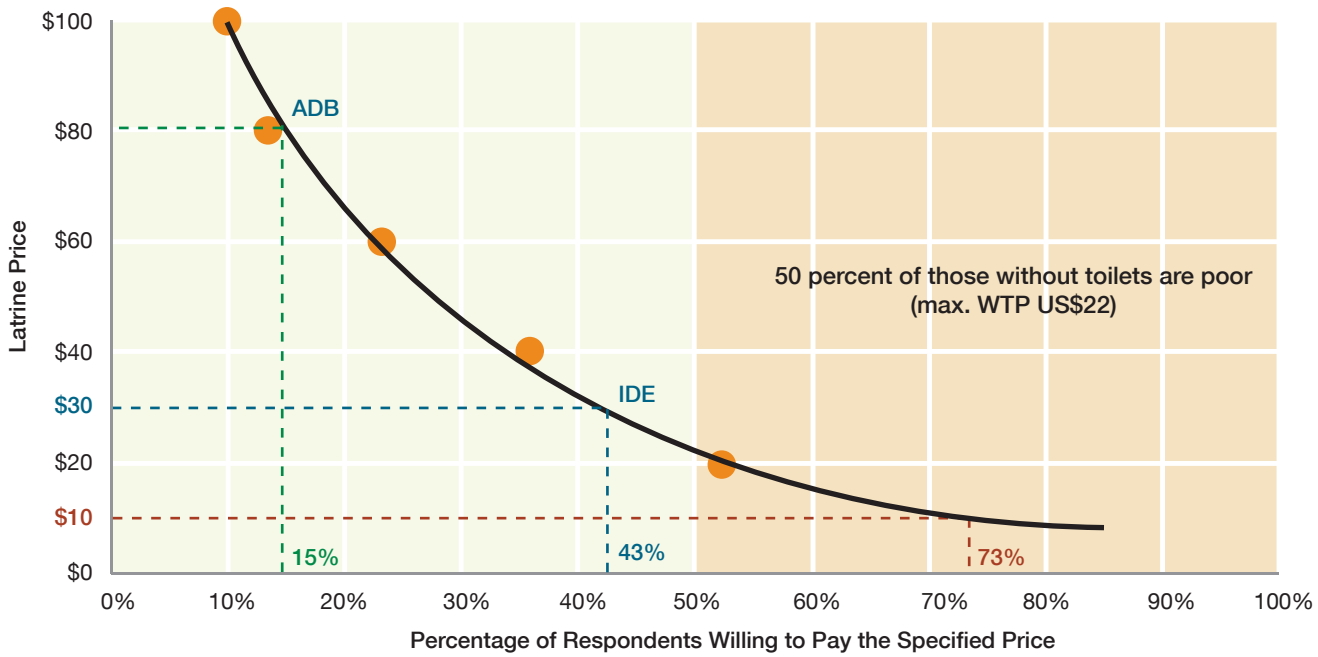
IDE also developed higher cost options including an upgrade package to convert the latrine core into a twin pit latrine, which will cost only US$14; and a tiled slab latrine core package with four concrete rings that costs US$30. The IDE approach assumes that purchasers will be able to install the latrine components themselves, which was one of the reasons for developing a "pan stand" that enables the local gooseneck latrine pans to be connected to the latrine pit without the need for specialist masonry skills[59].

The superstructure cost is additional to the US$25 latrine core. IDE estimates that construction of a simple thatch enclosure costs only US$5; a larger cement slab and GI corrugated sheeting walls and roof about US$45; and a concrete slab, brick walled enclosure and a GI sheet roof about US$125.

The IDE willingness-to-pay data suggest that less than 43 percent of households without a latrine will be willing to pay US$30 or more for a new latrine. Given that 50 percent of those without latrines are below the poverty line, these data imply that poor households will not be able to afford the IDE sanitation core

[59] Standard pour-flush latrine installations in Cambodia require the construction of a brick and cement chamber under the latrine pan containing a sloping channel that directs the wastes into a pipe connected to the latrine pit.

FIGURE 4.3: WILLINGNESS TO PAY FOR A LATRINE (BY RURAL HOUSEHOLDS WITHOUT A LATRINE)



IDE has made some efforts to develop lower costs latrine models, including a dry pit latrine and a bamboo-lined latrine pit, but it is clear that the bulk of the program resources and activities are linked to the more expensive US$30 sanitation core.

However, IDE reports that its initial village marketing campaigns have generated sales right across communities, with even poor households committing to buy the US$30 latrine core. Willingness-to-pay estimates are notoriously unreliable, given the difficulty of averaging highly variable and easily influenced spending intentions across large and diverse populations, thus it is possible that effective marketing of a more desirable sanitation product has shifted the willingness to pay curve upwards, thereby capturing a far higher proportion of those without latrines at the US$30 price point.

IDE: TARGETING

The IDE program will target areas within 20 km of main roads in order to reduce the delivery costs for its producers, thus will exclude remote villages with higher levels of poverty and lower sanitation coverage. The program is also dependent on bulk orders from each village, as producers will not be willing to transport goods for only one household.

Furthermore, the IDE program is not aiming for 100 percent coverage in its target villages. The main program objective is to sell 10,000 improved sanitation facilities, with no incentives for achieving collective outcomes, such as ODF status.

IDE: PROGRAM COSTS

While no expenditure data are yet available from the IDE program, the program budget was used to estimate the planned cost per latrine. Given the market-based nature of the program, whereby households make decisions to invest their own resources in sanitation facilities, it is hoped that latrine usage rates will be relatively high.

The cost figures presented below make no allowance for non-usage, collapse or breakage of the IDE-supported household latrines, thus may be underestimates of the unit cost per "latrine in use". The cost figures are based on the program goal of selling 10,000 latrine packages in only 21 months, which may be exceeded (if the program is ex-

tremely successful). But the short timeframe suggests that it is more likely that this figure is ambitious, in which case the costs presented below will be underestimates of the true program cost per latrine.

The program cost data suggest that the following average costs will be linked to the program sanitation development activities:

Software (hygiene promotion, training)	= US$20 per latrine
Program costs (management, technical assistance)	= US$56 per latrine
Average project sanitation cost	**= US$76 per latrine**
Household contribution (cash and in-kind)	= US$60 per latrine
Average latrine cost	**= US$136 per latrine**

The total cost per latrine is greater than the US$107 per latrine estimated for the Plan CLTS program due to the higher estimation of household investment. However, the IDE costs include only US$20 per latrine for the CLTS promotion and other marketing activities, compared with US$48 for software activities in the Plan program; and the IDE program expects to provide a far higher level of service – a pour-flush latrine with a lined latrine pit – than that provided under the Plan program.

4.4 WTO-LIEN AID SANITATION MARKETING PROGRAM

The World Toilet Organization (WTO) and LienAid sanitation marketing program builds on the research and development work done by the IDE program, supplemented by its own research on reasons for investment (and non-investment) in sanitation facilities.

One of the key differences between the two sanitation marketing programs is that the WTO-LienAid program has identified the provision of the superstructure as critical to the success of sanitation interventions. Their research suggests that one of the factors influencing low latrine usage rates is the failure to complete a superstructure, which then limits the comfort and privacy of the facility. Therefore, at the time of the study, the WTO-LienAid program was in the process of developing a low-cost and mobile "flat-pack" latrine enclosure that it planned to market for around US$50.

The WTO-LienAid program was not yet in the full implementation phase, but it planned to sell 4,000 latrine packages over the following twelve months. Given a total budget of US$338,000, achievement of this target will mean a program cost per latrine of about US$84. The WTO-LienAid intention to market latrine enclosures as well as the latrine core suggests that the average household contribution is likely to be higher than in the IDE program.

The program cost data suggest that the following average costs will be linked to the program sanitation activities:

Software (marketing, research, strategy)	= US$28 per latrine
Program costs (management, technical assistance)	= US$56 per latrine
Average project sanitation cost	**= US$84 per latrine**
Household contribution (cash and in-kind)	= US$80 per latrine
Average latrine cost	**= US$164 per latrine**

V. Comparative Analysis

The comparative analysis examines the four programs (ADB, Plan, IDE, WTO-LienAid) using a set of parameters developed by the WSP sanitation financing study. The following table summarizes the key variables that were used to produce the charts shown in the sections below.

TABLE 5.1 COMPARATIVE ANALYSIS OF SANITATION FINANCE PARAMETERS

	ADB	Plan	IDE	WTO-LA
Number of people served	163,974	12,149	48,000	19,200
Facilities built per year	13,955	1,321	5,714	4,000
Hardware subsidy per household	US$88	US$0	US$0	US$0
Hardware subsidy (% of cost)	42%	0%	0%	0%
Hardware subsidy per unit	US$88	US$0	US$0	US$0
Software support per unit	US$59	US$89	US$76	US$84
Household investment per unit	US$120	US$18	US$60	US$80
Total cost per unit	**US$266**	**US$107**	**US$136**	**US$164**
Leverage ratio (household to program)	82%	20%	79%	95%
Increased access per US$1,000 public finance	7	11	13	12
Hardware cost (% average income)	14%	1%	4%	5%
Hardware cost (% poor income)	26%	2%	7%	10%
Household investment (% average income)	8%	1%	4%	5%
Household investment (% poor income)	15%	2%	7%	10%
Inclusion error	90%	-	-	-
Exclusion error	97%	-	-	-
Non-subsidized investment (% total invest)	58%	100%	100%	100%

The following charts present a comparative analysis across the four case studies. However, it should be noted that the data included for the IDE and WTO-LA sanitation marketing programs are based on planned outputs rather than actual outcomes. As noted earlier, some of the marketing targets set by the programs are ambitious, given relatively short intervention periods, hence it is possible that some of the data presented below will prove to be overestimates of the eventual performance of the marketing programs.

5.1 SCALE AND SPEED

While all of the programs serve (or plan to serve) more than 10,000 people, the ADB program is several times larger than the others. The programs are also of similar duration, thus the pattern formed by the number of sanitation facilities built (or planned) per year is similar to the program scale pattern.

FIGURE 5.1 PROGRAM SCALE

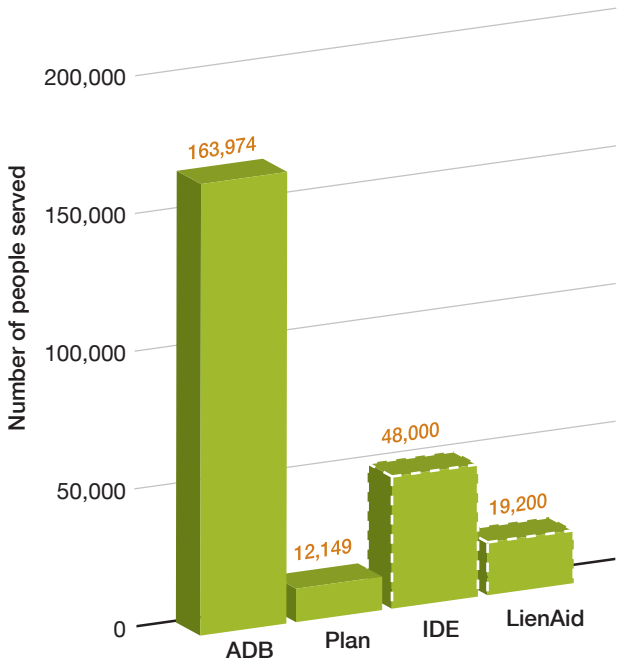
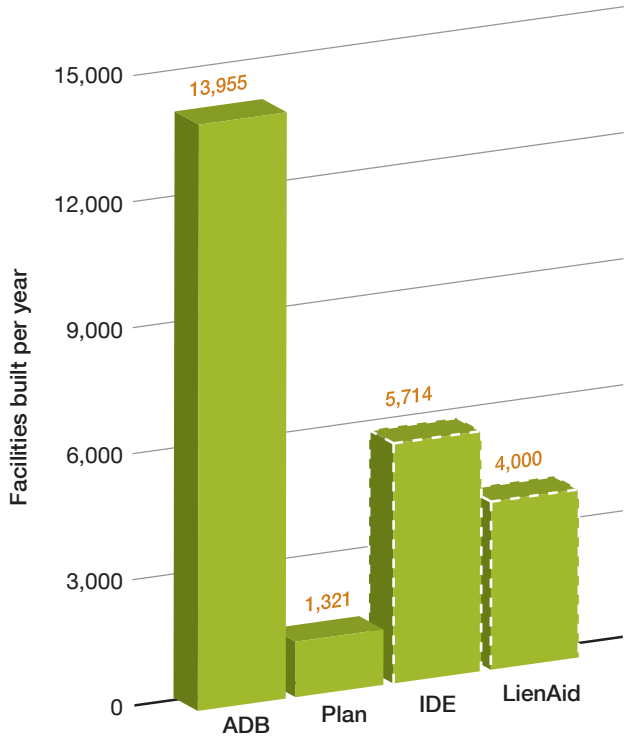


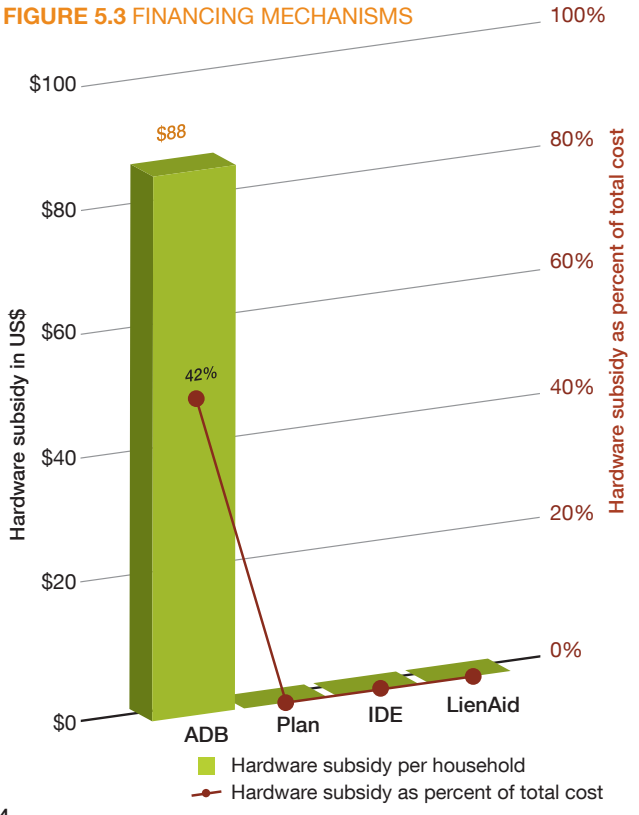
FIGURE 5.2 PROGRAM SPEED



5.2 FINANCING MECHANISMS

Figure 5.3 confirms that the ADB program is the only one of the four that provides a sanitation hardware subsidy

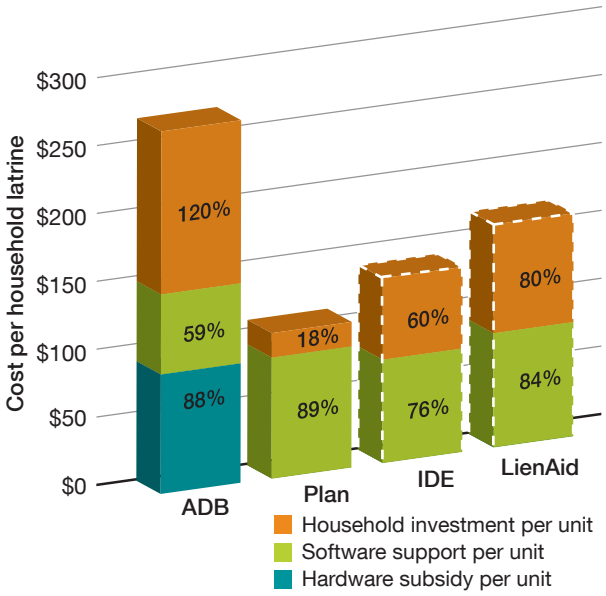
FIGURE 5.3 FINANCING MECHANISMS



5.3 COST PER HOUSEHOLD LATRINE

The Plan program achieves the lowest cost per latrine due to the significantly lower household contributions involved.

FIGURE 5.4 TOTAL LATRINE COSTS



5.4 PUBLIC FINANCE EFFICIENCY

The Plan program has the lowest leverage ratio of the four programs. The other three programs achieve leverage ratios close to parity, which means that every dollar invested in the program leverages an equivalent spend by the user household, whereas the Plan program spends US$5 per US$1 invested by the household.

FIGURE 5.5 HOUSEHOLD INVESTMENT PER DOLLAR OF PROGRAM EXPENDITURE

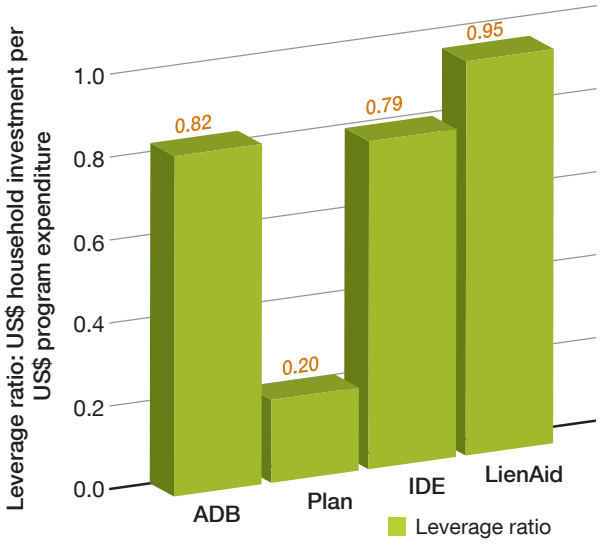
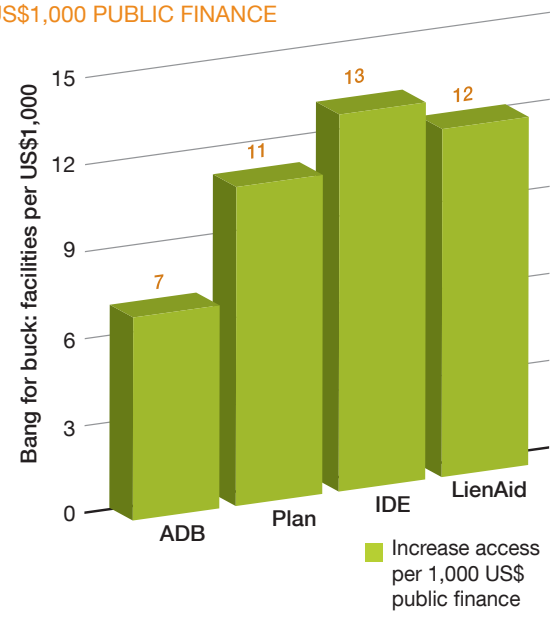


FIGURE 5.6 NUMBER OF SANITATION FACILITIES PER US$1,000 PUBLIC FINANCE



5.5 INVESTMENT AGAINST INCOME

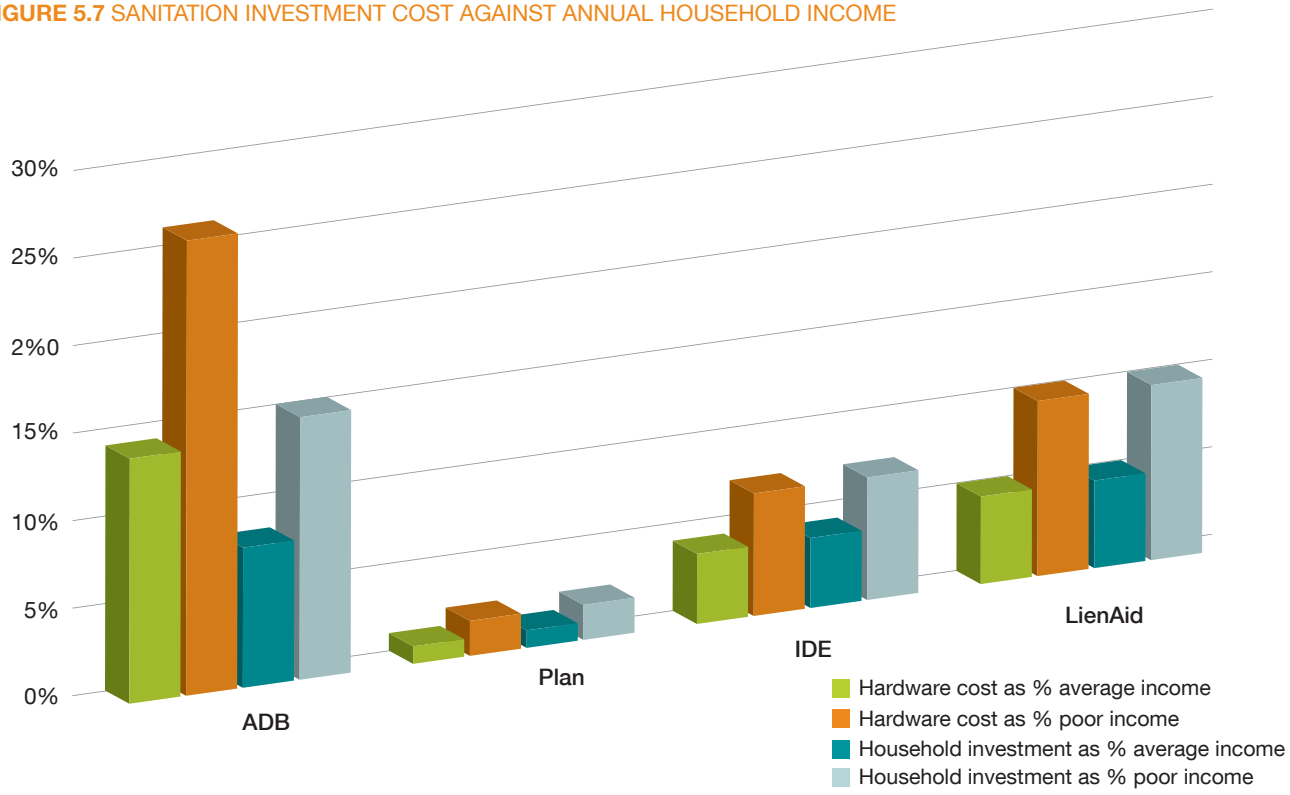
The Cambodia poverty data obtained from the World Bank suggested low annual consumption levels: US$1,525 per year average consumption for rural households, and US$815 per year average consumption for poor rural households.

In most countries, expenditures of less than 5 percent of annual income on water and sanitation services are deemed affordable. No data were available on water supply costs, but the financial data suggest that the Plan program is affordable, requiring household investments of only 2 percent of the annual consumption of a poor household. The other three programs all require households investments higher than 5 percent: 7-10 percent in the IDE and LienAid projects, and 15 percent in the ADB program. These data reinforce the earlier findings that most of the sanitation facilities supported by these programs are likely to be constructed by non-poor households.

5.6 OPERATION AND MAINTENANCE COSTS

The ESI household survey provided some information about operation and maintenance (O&M) costs. In the Plan CLTS program, 80 percent of the dry pit latrine users reported no repairs and no O&M costs, while the remaining 20 percent made repairs to the latrine enclosure that were valued by the users at zero cost. In the ADB program, 96 percent of the pour-flush latrine users reported no repairs and no O&M costs, while the three households that made repairs to their latrine enclosures spent an average of US$45 per latrine.

FIGURE 5.7 SANITATION INVESTMENT COST AGAINST ANNUAL HOUSEHOLD INCOME



At the time of the study, none of the latrines in the ADB or Plan programs is more than two years old, and no full latrine pits or pit emptying costs were reported.

The limited O&M analysis highlights the fact that, while low-cost CLTS toilets may require more frequent repairs than the more durable pour-flush designs implemented under the ADB program, these repairs usually cost very little. When the average cost of the latrine is only US$13, and the majority of this amount is the value of local materials used in the construction (e.g. thatch for the walls and roof), then most repairs are likely to be affordable. In contrast, more expensive latrines with rendered brick enclosures are likely to last longer without repair, but any repair costs are likely to be higher and require cash expenditures for the purchase of cement and other market-bought materials.

The WSP sanitation financing study[60] concluded that where operating costs were high as a proportion of investment costs – such as in the Bangladesh program, where annual operating costs were estimated to be 30 percent of the latrine investment cost – "savings may be achieved by building more solid latrines in the first place". This conclusion assumes that the annual operating costs are a burden on the household, but neglects the fact that these operating costs are actually minimal because of the low initial cost of the latrine. Despite the assumed burden, the case study also noted that most latrines were clean and well maintained, which implies that few households have problems in undertaking the regular operation and maintenance tasks.

Significantly, the Bangladesh operating costs were overestimated. It was assumed that the pit would be emptied every year, which would be unusual; that all households would pay someone to empty their pit, or to dig a new pit and relocate the latrine, whereas in practice many poor households would undertake this work themselves; and that cash purchases for soap, sandals, brooms and water pots would amount to US$4 per year.

In practice, as found by the ESI survey of Plan program households, poor households make very few purchases for the operation and maintenance of latrines. Brooms are made from local materials, plastic water pots are used for many years, and soap is cheap. The major maintenance cost relates to emptying a full pit, or to the relocation of the latrine above a new pit. The Bangladesh study estimated that the pit emptying cost averaged about US$1 per year, even when paid to others.

The conclusion of this study is that careful valuation of operation and maintenance costs is required to provide a realistic picture of the impact of these costs. While it is true that regular repair and rebuilding costs are likely to be a disincentive to sustainable latrine usage, if these costs are nominal (e.g. valued by the households at zero cost), then this is unlikely to be a major factor in latrine use practices.

5.7 SUMMARY OF COMPARATIVE ANALYSIS

The comparative analysis confirms that public finance for sanitation in Cambodia is not reaching those below the poverty line. Ninety percent of the public finance for the large ADB program goes to non-poor households, and the two sanitation marketing programs will require households to contribute at least US$30 in order to obtain a latrine, whereas the willingness to pay data imply that US$10 is the maximum amount that most poor households are willing to spend on a latrine.

The Plan CLTS program promotes far cheaper and simpler facilities than the other programs, which should be more affordable and appropriate for poor households. However, the latrine coverage and usage data suggest that, on average, 35 percent of households in the program communities continue to practice open defecation. Given progressively lower sanitation coverage among the poor, it seems likely that the bulk of those not reached by the program – those not, or no longer, practicing improved sanitation – are poor households.

Demand creation is critical to all of the sanitation programs. The ADB program implementers report that significant efforts were required to generate demand for the latrines promoted, despite the substantial subsidy offered by the program. Furthermore, the promotion of highly-subsidized pour-flush latrines by previous programs has created high expectations among low-income communities.

[60] Tremolet S, Perez E and Kolsky P (2009) Financing on-site sanitation for the poor: a global six country comparative review and analysis The World Bank, Water and Sanitation Program, draft report.

The IDE sanitation marketing program found that an adapted form of the CLTS approach was the most cost-effective method of generating demand for its sanitation products. It was also noted that communities where CLTS had already been implemented exhibited much stronger demand for a range of sanitation products, including low-cost dry latrine products, than other communities.

Sanitation programs need to promote sanitation options that are affordable and appropriate to poor households, and also need to address sustainability issues. The main ADB sanitation model required a minimum US$80 cash contribution, which meant that only non-poor households were able to gain the US$107 subsidy offered by the program. The high program cost of this approach also limited the number of latrines that could be subsidized, thus resulting in a much lower increase in sanitation coverage than expected.

However, the initial findings of the IDE sanitation marketing program suggest that willingness-to-pay for more desirable and targeted sanitation products may be higher than previously estimated. Nonetheless, many of the poorest households – those with the most acute health, social and economic burdens – have limited cash availability, thus are unlikely to purchase market-bought products unless the prices are significantly lower.

The use of public finance to subsidize the development, promotion and marketing of appropriate sanitation products is to be encouraged, but it appears that the current sanitation marketing programs are unlikely to benefit many poor households. Given that each IDE latrine package currently costs US$76 in software and program support costs – more than double the cost of the latrine core – a substantial transfer is being made to non-poor households. It is hoped that these investments will contribute to the development of sustainable local supply chains, which should enable long-term improvements in the availability, cost and quality of sanitation goods and services. In addition, it is likely that the marketing cost per latrine package will decrease over time as the initial development is completed and understanding of market drivers improves. Nevertheless, it is important that an appropriate amount of public finance is directed towards developing and marketing products and services that are specifically targeted at the poorest households and those that cannot afford the US$30 sanitation core package.

In addition, most of the sanitation programs promote single pit latrines, which require emptying when full or, if a direct pit latrine, removal and relocation of the platform and latrine enclosure. No sanitation finance is provided to support this critical process, and little monitoring is carried out, thus there is a substantial risk that the pit emptying results in unsafe disposal of fresh excreta within or around the village, or that latrine usage is abandoned when the latrine pit is full.

Finally, few of the programs have been successful in achieving collective sanitation outcomes, which should be the ultimate aim of all sanitation programs (in order to eliminate externalities). The population segment that practices open defecation in the program communities is largely made up of poor households, and generally includes those with the highest disease burdens, hence those that are most likely to transmit diseases to others through unsafe excreta disposal. As a result, the benefits achieved by these sanitation programs are likely to be limited.

VI. Improved Approaches to Sanitation Finance

6.1 LEAVE NO ONE OUT – USE A SEGMENTED APPROACH

The lessons from the case studies and theoretical analyses suggest that a segmented approach is needed, with complementary programs designed to ensure that each of the unserved groups (or market segments) receives some form of assistance in developing improved sanitation facilities and adopting improved sanitation and hygiene behaviors.

A segmented approach implies not that every sanitation program has to target all population groups, but that the sanitation sector adopts a more harmonized and coordinated approach, whereby the target group for each program is clearly identified, and any gaps are highlighted so that complementary programs can be added.

This sectoral approach also requires that individual sanitation programs do not undermine each other though, for example, by adopting policies that are likely to lessen demand for other sanitation services. A more coordinated approach does not imply that everyone has to adopt identical policies but that policy clashes should be identified and, wherever possible, modified to improve the complementarity of the programs.

The IDE sanitation marketing program provides an example. An NGO working in the IDE project area was providing free US$300 latrines to selected poor households. IDE was concerned that these subsidized latrines would lessen demand for its non-subsidized sanitation cores, thus approached the NGO to discuss the matter. As a result of these discussions, the NGO agreed to revise its approach to focus on the provision of subsidized above-ground latrine enclosures to poor households that had already bought the IDE latrine core. This solution allowed the NGO to continue to provide assistance to poor households, expanded the number of households that the NGO could afford to assist, and provided additional incentives for poor households to buy the IDE latrine cores: a win-win outcome.

Social protection literature suggests that direct support should be provided only to the poorest. In Cambodia, the most easily identifiable group for direct support are food-poor households, which are loosely classified as Poor Level 1 by the ID-Poor system. The remainder of those without sanitation include poor households above the food poverty line, and non-poor households. Both groups would benefit from the promotion of improved sanitation and hygiene, and from an improved supply of affordable and appropriate sanitation goods and services. It also recommends that microfinance programs should be developed to provide loans to non-poor households for sanitation improvement, perhaps as part of broader finance packages for home and environmental health improvement.

6.2 CHECK WHO BENEFITS – MONITOR TARGETING EFFECTIVENESS

At present, few sanitation programs are effective in reaching poor households, thus greater and more specific efforts are needed to target benefits more closely, and to monitor the effectiveness of this targeting through the measurement of inclusion and exclusion errors.

The inclusion of a relative wealth ranking – usually conducted through a short participatory assessment – in the baseline activities of all sanitation programs would allow an easy assessment of post-intervention targeting outcomes. Specifically, sanitation programs should measure the number and proportion of poor households that are reached by their program, and the number of non-poor households that benefit. In addition, feedback loops are required so that targeting and service delivery systems can be improved when poor targeting performance is detected.

6.3 AIM FOR EFFICIENCY – RECOGNIZE MARKET ADVANTAGES

The case study analysis highlights the relative efficiencies of the different delivery mechanisms. Despite similar expenditures on software and program support, the latrine materials delivered by the ADB program cost more than double those provided through the IDE sanitation marketing program.

While a more detailed study is needed to identify the details and modalities of the different cost advantages, it appears that market-based mechanisms – whereby consumers purchase goods and services from private service providers – are far more efficient and cost-effective at delivering sanitation goods than local government systems, even if (as in the ADB program) service delivery is contracted out to private service providers.

Competition should be encouraged by ensuring that multiple service providers are available in each locality, and that transfer beneficiaries are free to choose locally accountable service providers.

6.4 USE VOUCHERS TO ENCOURAGE SUSTAINABLE SERVICE PROVISION

The advantages of a market-based delivery system argue for transfers that allow beneficiaries to select service providers based on reputation, price and preference, rather than program-driven decisions regarding the most efficient or effective provider. This approach should help to develop sustainable local supply chains that continue to provide services and develop new products even after sanitation programs are finished.

This finding suggests that demand-side transfers, such as vouchers for latrine materials and rebates for latrine construction, may be the most efficient form of sanitation finance. Cash vouchers redeemable at local producers could be linked to sanitation marketing programs, replacing current systems designed to deliver specific sanitation goods to rural households.

A fixed value voucher could be linked to a minimum level of sanitation service, with provision for some contribution by the household. Eligibility for a latrine voucher could be linked to existing means testing systems such as the ID-poor, with additional criteria, such as households containing children under five, added to reduce the number of beneficiaries where resources are limited.

6.5 DESIGN FINANCE FOR LONG-TERM SANITATION PRACTICE

The focus of most sanitation programs is on the short-term; on promoting or providing support for the construction of a sanitation facility. Few sanitation programs contain provision for assistance for upgrading latrines over time, for the construction of a second latrine pit, or for the provision of benefits to households that maintain good sanitation and hygiene practices.

An improved approach to sanitation finance should recognize that the initial construction of a household latrine is only the first step in a process towards improved sanitation and the embedding of good sanitation habits. The CCT approach suggests that sanitation finance should be used to provide incentives for improved behavior, for increased use of sanitation services, and for improved sanitation among children. Specific mechanisms should be designed to finance safe disposal of full latrine pits and development of a second latrine pit.

Few existing sanitation finance mechanisms contain any provision for finance dependent on children's sanitation behavior, or for monitoring of child sanitation outcomes as a measure of program performance. The effects of early deprivation, such as stunting, have lasting impacts on child development, while the habits and practices learned during these early years are often retained throughout life. An improved approach should target children specifically and should provide specific incentives for the development of improved sanitation behavior and outcomes during the first five years of a child's life.

6.6 USE NATIONAL MEANS TESTING SYSTEMS

Sanitation programs often rely on their own targeting systems. For a number of reasons, these targeting systems are rarely effective in directing benefits to poor households. The case studies in Cambodia confirm the targeting problems faced by programs reliant on self-targeting or on targeting criteria developed for combined water supply and sanitation interventions.

Wherever possible, sanitation programs should aim to base targeting mechanisms on existing large-scale means testing systems, such as the ID-Poor system in Cambodia. These systems use objective criteria and usually benefit from economies of scale that reduce administrative costs. Most targeting systems have some shortcomings, but national systems that are used to target social protection programs are likely to be more reliable for targeting benefits to poor and vulnerable households than most local systems.

Additional demographic and geographic requirements could be added to the means testing system, such as targeting mothers with children aged under five who live in households classified as Poor Level 1 in areas with high child malnutrition rates.

6.7 DEVELOP COMPLIANCE MONITORING SYSTEMS

Improved monitoring is central to sanitation development, and remains one of the main challenges of sanitation programs. Improved approaches should encourage household WASH cards that record household facilities, monitor facility condition, register construction of a second latrine pit, and provide usage records that can be monitored by transfer schemes. The same cards could also be used to record attendance at hygiene promotion sessions and completion of hygiene improvement courses, using a similar model to the Community Health Clubs[61] developed in Africa.

Local government bodies, NGOs and CBOs should be used to verify targeting and monitoring systems, alongside social accountability tools such as citizen report cards and score cards that hold service providers accountable.

[61] Waterkeyn J and Waterkeyn A (2005) Taking PHAST the extra mile through Community Health Clubs: the AHEAD methodology Africa AHEAD website.

VII. Innovation: The Grow-Up-With-A-Toilet Plan

The following plan is proposed to ensure that every child in Cambodia "grows up with a toilet" through the provision of sanitation finance to poor households during the first five years after their first child is born. The intention is that the development of improved sanitation facilities and the establishment of good sanitation practices among both parents and the first-born will ensure that the rest of the family grows up using a hygienic latrine and observing good sanitation and hygiene practices.

The five-year plan would be targeted at poor mothers on the birth of their first child, on the basis that poor children under-five are the highest risk group for diarrhea, malnutrition and worms. Assistance would be provided to the mother of the household to improve household sanitation throughout the five-year period, with both connection subsidies (designed to provide incentives for the construction of facilities) and outcome-based sustainability incentives (designed to encourage long-term improved sanitation practices).

Year 0 (birth of first child)	US$15 toilet voucher (redeemable at local producers)
Plus	US$5 rebate on construction of second latrine pit
Year 1- 5 (annual reward)	US$0-10 each year based on following criteria • Toilet usage (verified) • Village toilet coverage (verified) • Completion of hygiene course • Presence of handwashing facility

The plan would be supported by demand creation programs (CLTS, mass media), sanitation marketing programs to increase and improve the supply of low-cost sanitation goods and services, and microfinance programs to enable non-poor households to develop improved sanitation facilities.

The intention of the plan is three-fold: firstly, to focus attention on the need to target sanitation finance towards improved sanitation among under-five children; secondly, to recognize that sanitation finance should promote a process of sanitation development over a period of several years (providing incentives for the upgrading of facilities and the adoption of improved behaviors); and thirdly, to encourage more efficient demand-side financing through vouchers and cash transfers in place of existing mechanisms for the supply of in-kind materials and services.

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ANNEX 1 MEETINGS HELD IN CAMBODIA

Siem Reap: 05-07 October, 2009

1. Karin Schelzig-Bloom, Social Sector Specialist, ADB
2. Jan Willem Rosenboom, WSP Cambodia Country Team Leader
3. ADB TS-RWSSP Provincial Management Unit, Siem Reap Province
4. ADB TS-RWSSP Provincial Management Unit, Kampong Thom Province
5. Mao Saray, ADB TS-RWSSP Project Director

Phnom Penh, 08-23 October 2009

1. Lyn McLenan, Lien Aid Cambodia Program Manager
2. Danielle Pedi, WTO Singapore
3. Sahari Ani, Lien Aid Cambodia CEO
4. Phyrum Kov, WSP Cambodia Water Supply and Sanitation Analyst
5. Jobien Monster, WSP Cambodia independent consultant
6. Syvibola Oun, Plan Cambodia WES adviser
7. Geoff Revel, UNC Program Manager
8. Cordell Jacks, IDE Cambodia
9. Wan Maung, ADB TS-RWSSP Consultant Team Leader
10. Hilda Winarta, UNICEF Cambodia WASH program officer
11. David Hill, USAID Small and Medium Enterprise Development Project
12. Dr. Chea Samnang, Director of Rural Health Care, Ministry of Rural Development, Royal Government of Cambodia
13. Harold Alderman, World Bank Social Protection Specialist
14. Timothy Johnston, World Bank Cambodia Health Specialist
15. Rebecca Carter, World Bank Aid Coordination Specialist
16. Michelle Pendrick, World Bank independent consultant

Also attended one-day World Bank organized seminar on conditional cash transfers (19 October 2009, Phnom Penh).


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