



Sharing Experiences

Sustainable sanitation in South East Asia and the Pacific



 **WaterAid**
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WaterAid – water for life

The international NGO dedicated exclusively to the provision of safe domestic water, sanitation and hygiene education to the world's poorest people.

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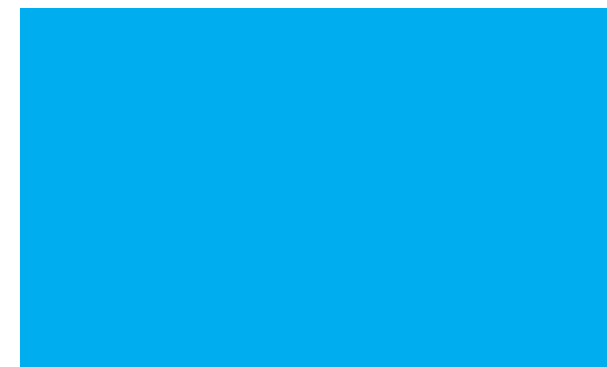
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Foreword

The strategies to promote sanitation adopted by governments and international agencies around the world are failing. At present rates of progress, the world will fail miserably to even come close to the sanitation target of the Millennium Development Goals. We need a radical and innovative change in approach, but there is no single solution to the problem, as the most appropriate strategy depends on the context and varies from one setting to another.

Non-Governmental Organisations have played an important role as innovators, introducing novel and creative approaches at local scale, and learning the lessons from which others can benefit in taking them to scale country- or city-wide. This book documents a number of those approaches, and the lessons learned.

One common shortcoming in sanitation program strategies is neglect of the differences from water supply. Whereas water supply requires decisions at the level of the community, installing a latrine is largely a decision for the individual household, who must first be persuaded of its advantages. On the other hand, some approaches have mobilised community institutions and processes to convince many individuals to act together, building social capital and community spirit at the same time.

This book provides an opportunity for those in the region who work in sanitation to share their experiences—whether they started out as engineers, educators, public health workers, marketers, anthropologists or development generalists. I hope that by doing so, it will help to develop a genuine community of practitioners in this field, and to mobilise them to still greater efforts.

I wish it every success.

Sandy Cairncross

*Professor of Environmental Health
London School of Hygiene & Tropical Medicine*



IMAGE COURTESY OF WEDC. © BRIAN SKINNER

Introduction

Why a book on sharing experiences on sanitation?

In June 2007 a group of engineers, public health practitioners, local and international NGO staff, academics and government representatives gathered to discuss water and sanitation in South East Asia and the Pacific¹ at the *Let's Come Clean* Conference in Melbourne, Australia. At the conference, consensus emerged on the need for greater regional exchange of experience in sanitation. It was agreed that more could be done to document and disseminate practical lessons learned from water, sanitation and hygiene initiatives throughout the region.

Too often the experiences of those working on sanitation initiatives, both of project staff and local community members, remain undocumented or buried in unpublished reports. The difficult lessons, for example those pertaining to sensitive political or social issues, go unheard or underplayed while technical issues are dealt with at length. Field manuals, technical guides and training manuals abound, but very few publications

attempt to tell the stories of those working on the ground, the practical issues they face and the lessons they learn. The case studies presented in this book are an attempt to share some of this experience.

The purpose of this collection is simply to contribute to a growing, and reflective, community of practice in sanitation and hygiene initiatives in South East Asia and the Pacific and beyond.

The case studies have been prepared for those with an interest and involvement in sanitation and hygiene education, and should be of use to those who wish to learn more about work happening in the region. It is hoped that these case studies will stimulate discussion, motivate people to read further, build interest in a range of approaches, and more broadly contribute to making—and keeping— sanitation the topic of conversation.

The facts

The statistics on sanitation are confronting: currently over 2.6 billion people, or 40% of the world's population, are without access to basic sanitation. At present trends, the world will not meet the Millennium Development Goal (MDG) commitment of halving the global proportion of people without access to improved sanitation by 2015.² The target will be missed by over half a billion people. Even if the MDG target were to be met, this would still leave 25% of the world's population without access to safe sanitation facilities and thus forced to defecate in open or unsanitary places. The majority, 1.7 billion people, will be rural dwellers (JMP 2006). While doing better than some other regions, notably sub-Saharan Africa, the situation in South East Asia and the Pacific is poor. An estimated 185 million people in the region lack access to improved sanitation, and 10 of the region's 22 countries are not on track to meet the MDG target for sanitation (WVA and WAAus 2007).

Despite the known health risks posed by open defecation, sanitation has long been considered a 'hidden epidemic' which has simply not been a priority on national development agendas. Although the global sanitation gap is double that of water supply, as water supply's 'poor cousin', sanitation enjoys far less interest or investment.



185 million people in the region lack access to improved sanitation and 10 of the region's 22 countries are not on track to meet the MDG target for sanitation.



1 South East Asia and the Pacific is defined here as the fifteen Pacific developing countries that use Australian assistance (Cook Is, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Is, Tokelau, Tonga, Tuvalu, Vanuatu) and seven South East Asian developing countries (Burma, Cambodia, Indonesia, Lao PDR, Philippines, Timor-Leste, Viet Nam). This definition of South East Asia and the Pacific will be used throughout the paper.

2 The Joint Monitoring Program considers the following to be 'improved' sanitation facilities: 1) flush or pour-flush to piped sewer system, septic tank or pit latrine; 2) ventilated improved pit latrine; 3) pit latrine with slab; and 4) composting toilet. Only facilities which are not shared or are not public are considered 'improved' (WHO and UNICEF 2006).



Hand washing with soap could alone reduce risk of diarrhoeal diseases by 42 - 47%

IMAGE COURTESY OF WEDC. © SANDY CAIRCROSS (LSHTM)

The importance of sanitation and hygiene

Diarrhoeal diseases account for 4.1 percent of the global burden of disease or 1.8 million deaths per year, of which 90 percent are children under 5 (WHO 2004). Eighty-eight percent of diarrhoeal diseases are attributable to poor water supply, sanitation and hygiene. In South East Asia and the Pacific, an estimated 80,000 deaths of children under five are caused by diarrhoeal diseases each year (WVA and WAAus 2007).

The vast majority of diarrhoeal diseases are caused by pathogens (e.g. viruses, bacteria, parasitic worms) located in human excreta (faeces and urine). The F-diagram (page 5) depicts the primary transmission routes of these pathogens from the faeces of an infected person to the mouth of a new host (faecal-oral transmission), and also the primary and secondary barriers that can prevent this from happening. The primary barriers are the most effective way of reducing disease transmission and include:

- Constructing sanitation facilities for the safe removal of faeces from the environment in order to prevent contact with humans, stop spread of disease by flies and prevent contamination of drinking water, fields and floors; and
- Removing traces of faecal material from hands by washing hands with soap after defecation or after handling children's faeces (WSSCC and WHO 2005).³

The health benefits of sanitation and hygiene in preventing diarrhoeal disease is born out in the evidence: safe excreta disposal results in an estimated 36% reduction in diarrhoea under typical conditions, while hygiene promotion accounts for an additional 48% reduction in diarrhoea (Cairncross and Valdmanis 2006).⁴ In fact, the single hygiene behaviour of hand washing with soap could alone reduce risk of diarrhoeal diseases by 42-47% (Curtis and Cairncross 2003).

In economic terms, the global cost of not meeting the MDG targets on water and sanitation has been estimated at US\$38 billion per year, with sanitation accounting for 92% of this value (Hutton *et al.* 2006). Financial losses due to poor sanitation and hygiene from only four countries in the region—Cambodia, Indonesia, the Philippines and Vietnam—have been estimated at US\$9 billion per year (Hutton *et al.* 2007). These losses include an annual US\$4.8 billion in health-related economic costs (including the cost of health care treatment, reduced productivity and premature mortality) as well as wider water resource, environmental and welfare impacts.

Often forgotten and poorly resourced, sanitation has rarely received the attention it deserves.

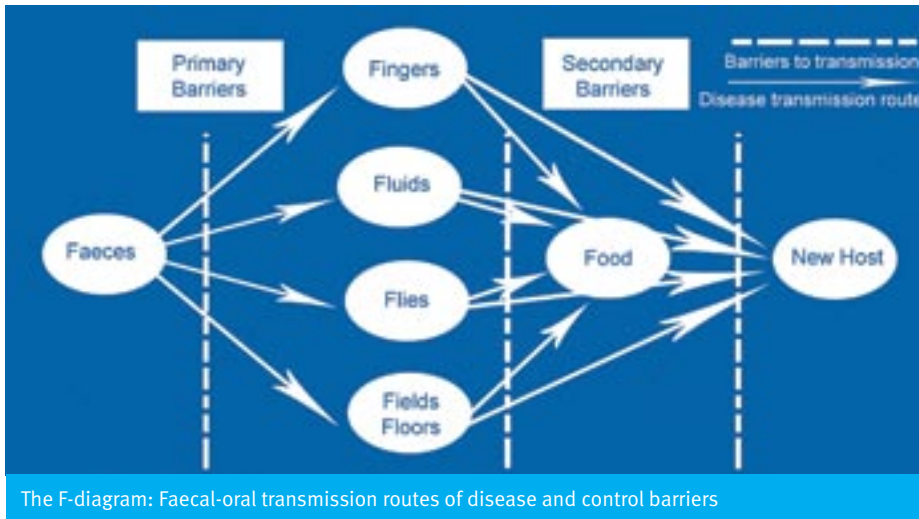
Yet this situation has begun to change. Momentum for action on sanitation is building as its role in improving health and educational outcomes, reducing poverty and protecting the environment are more widely acknowledged. Political and financial support for sanitation initiatives is on the rise and decision-makers, both national and international, are beginning to realise the importance of investing in policies and programs that explicitly address sanitation and hygiene.

Adding weight to the global commitment to meet the MDG sanitation target, the United Nations has designated 2008 as the

'International Year of Sanitation'. This should further raise the profile of sanitation and add an increased sense of urgency to the need for action in years to come. In this region, the Asian Development Bank has committed to making sanitation a priority for investment through its 'Dignity, Disease and Dollars' sanitation challenge (ADB 2007), whilst the inaugural East Asia Ministerial Conference on Sanitation and Hygiene 2007 (EASAN 2007) resulted in a pledge by leaders from 15 countries throughout the region to increase national investment for water and sanitation, particularly for the poor and marginalised. As greater investment and attention are directed to the sanitation sector, it is more important than ever that knowledge and experience on good (and not so good) practice is shared.

³ Secondary barriers stop pathogens that are in the environment from multiplying and reaching new hosts and include: hand washing before food preparation and eating; proper preparation, cooking and storage of food; protecting water supplies from faecal contamination, boiling or otherwise treating water and controlling flies (Curtis *et al.* 2000).

⁴ Existing evidence suggests that water sanitation, hygiene promotion and water supply improvements have effects on diarrhoea which are independent and additive to one another (Cairncross and Valdmanis 2006).



Adapted from Water and Sanitation Collaborative Council and World Health Organisation (2005). *Sanitation and Hygiene Promotion, Programming Guidance* (after Wagner and Lanoix 1958)

Addressing Sanitation needs in the region: The basics

The 2007 World Vision Australia and WaterAid Australia report 'Getting the basics right: Water Supply and Sanitation in South East Asia and the Pacific' highlights the following water and sanitation statistics for the region:

- In South East Asia and the Pacific, 80,000 children under five die each year of diarrhoea diseases. This translates into one child every seven minutes.
- The annual benefits to the region of meeting the MDG targets on water and sanitation include:
 - 42 million less cases of diarrhoea;
 - 18 million more school days and 167 million more work days, equating to AU\$936 million in direct health savings; and
 - Total economic benefits of over AU\$15 billion.
- The annual costs of meeting the MDG targets in terms of investment in the region would be AU\$6.4 billion.
- In South East Asia and the Pacific, the number of people without access to sanitation is double the number without water supply.
- The number of people without sanitation in rural areas of the region is more than three times that of urban dwellers.

Sanitation is essential for human dignity, safety, security and comfort. Defecation is closely associated with cleanliness in many cultures, and being forced to defecate in the open is a humiliating experience for many. Open defecation can be a dangerous experience for women and young girls, who risk sexual harassment if forced to defecate in the open at night.⁵ Access to sanitation is known to be a determinant of school attendance, particularly for young girls. Indeed, improved access to sanitation is fundamental to human development.

The sanitation gap

So why is there such a large gap in sanitation coverage and usage and why do hygiene practices remain poor? Whilst there are numerous reasons, the following rank amongst the most important:

- **Demand for sanitation is low or not fully expressed, and households often consider the cost of investment too high.** Few unserved households are fully aware of the invisible costs of inadequate sanitation, including poor health, lower productivity, inconvenience and environmental degradation. Since these households are usually the poor and marginalised, existing demand for sanitation is often ignored (Robinson 2007). Although women may express desire for sanitation facilities, they may have only limited influence on household decision-making. And even if demand for latrines is high, if affordable options do not exist households will be unwilling to invest.
- **Sanitation and hygiene are intensely personal and difficult to discuss.** In many cultures, sanitation is not a comfortable topic of discussion. Social norms and cultural taboos governing relationships may hinder frank discussion and complicate efforts to bring sensitive issues to the fore. Sanitation and hygiene education programs, messages and materials are often adapted from outside sources, with little relevance to local modes of transferring knowledge (Crennan 2005).
- **Interventions focus on building toilets, not changing behaviours.** Sanitation projects often focus on toilet construction or 'latrinisation' rather than sustained behaviour change (WaterAid 2006). Success is most often measured by the number of toilets built rather than the actual use of these facilities or of the adoption of hand washing and other hygiene practices. On-going maintenance of sanitation facilities and periodic hygiene promotion beyond the construction period is often neglected, resulting in poor upkeep of facilities and inconsistencies in behaviour.
- **Political and institutional barriers remain high.** Sanitation has not been a priority in the policies and budgets of national governments. Lack of clear responsibility for sanitation activities created by 'institutional fragmentation' and the absence of national-level sanitation policies are compounded by capacity gaps at the local government level (ODI 2006). The coupling of sanitation and hygiene with water supply, despite the very different issues surrounding each, has resulted in most investment going to water supply (WVA and WWAus 2007)).

⁵ In some cultures, women can go out for defecation and urination only under the cover of darkness, with potential negative health impacts such as increased prevalence of urinary tract infections (Cairncross and Valdmanis 2006).

Closing the gap: What have we learned?

Focus on behaviour change

The sanitation sector has attempted to address these challenges as knowledge and experience accumulates. Over time, with the growing recognition of the households' willingness and ability to invest in sanitation, there has been a shift from top-down supply-driven projects to an emphasis on bottom-up, demand-led approaches (de Bruijne *et al.* 2007). This shift has seen a far greater emphasis placed on 'software' elements of sanitation initiatives (e.g. hygiene education, demand creation, policy and regulation) rather than on 'hardware' or technical components. The challenge for most sanitation programs has thus become how to support household investments and behaviour change, rather than how to build and finance more toilet construction (WSSCC and WHO 2005). The shift in focus has also meant there is a much greater emphasis on the role played by strong policy and the need to establish an enabling environment.

Rather than tacking on a poorly conceived hygiene campaign to what is essentially a latrine construction project, those designing sanitation initiatives are now encouraged to plan and install hardware within the framework of an overall 'hygiene improvement' program (WSSCC and WHO 2005). Experience with hygiene interventions suggests the need to design a small number of clear and relevant messages targeted at specific groups within a community.⁶ This requires a very thorough understanding of current behaviours and practice.

⁶ Evidence on hygiene promotion programs suggests that too many hygiene messages confuse and tire an audience; the most relevant messages to achieve the desired outcome should be prioritised (e.g. not defecating in the open, washing hands after defecation) and targeted at specific groups (Curtis *et al.* 2000).

Stimulate demand, secure supply

Steps also need to be taken to increase the expression of informed demand and to improve access to sanitation hardware. While there is some debate about the best approach, stimulating demand in any given context will include a mix of marketing, promotion and educational strategies (de Bruijne *et al.* 2007). As with hygiene promotion, this requires an in-depth understanding of what people do and, more importantly, what they want. Indeed, in terms of user motivation for building a household latrine, there is a strong indication that health concerns are secondary to other concerns such as convenience, comfort, safety (particularly for women) and status. WSSCC and WHO (2005) highlight four key drivers of household demand that need to be addressed:

- **Awareness** of affordable options and their benefits;
- **Priority** for investing in a latrine over other potential investments;
- **Access** to a service provider; and
- **Influence** and ability to take decisions.

The goal is to turn toilets into attractive consumer items on the demand side, whilst on the supply side ensuring that cheap and appropriate options are available for every budget.

Sanitation Marketing: Balancing Supply and Demand

In many countries, the informal private sector (usually small independent providers) provides the majority of houses with sanitation facilities. Most toilets are built through the natural market, rather than through externally-supported programs. Sanitation marketing uses commercial marketing approaches to create demand for sanitation and to strengthen the informal private sector's capacity to supply appropriate good quality toilets.

Sanitation marketing is a kind of 'social marketing' which applies the 'four Ps' of commercial marketing: product, price, place and promotion. In commercial marketing, research is conducted to understand what people want and are willing to pay for. Products are developed, priced, tested and promoted, targeting groups who are most likely to purchase the product. In 'social marketing', the principles and techniques are the same, but the benefit or 'profit' goes to the consumer and the community as a whole.

To develop the sanitation market, suppliers need to make reasonable profits and consumers need to feel satisfied with the products and services they receive. Sanitation is treated like a consumer product, attractively packaged to suit various wealth categories and marketed widely.

Source: Obika, A. 2004. *The process for sanitation marketing*. WELL Fact Sheet. Available at www.lboro.ac.uk/well/resources/fact-sheets.



Community-Led Total Sanitation: Creating Community Demand

Community Led Total Sanitation (CLTS) uses a participatory process that allows the whole community to work out how to stop all open defecation and improve their natural and social environments using their own resources. External or village facilitators kindle feelings among people of shame and disgust about open defecation. Once 'triggered', the community unites to make changes using their own resources. This helps in creating a receptive environment for the adoption of improved practices in hand washing with soap, safe handling of food and water as well as safe disposal of excreta, solid waste and wastewater.

CLTS has several fundamental differences from conventional approaches, including:

- Focus on stopping open defecation (rather than building toilets);
- Need for collective action (to stop open defecation within the entire community);
- No toilet subsidy (households must finance their own toilets); and
- Promotion of low-cost home made toilets constructed using local materials (rather than standard toilet designs imposed by outsiders).

The approach is based on the assumption that the community has the strength and willingness to overcome their own sanitation problems. It recognizes that outsiders may be needed to help a community identify their current situation and the need for improvement but that given support, a community that wants to change can plan and implement solutions that meet their own needs.

In this case study collection, practical implementation of the CLTS approach in two countries is discussed:

- **Case Study 1** describes the process of institutional change required to scale up and ensure sustainability of the CLTS approach in Indonesia
- **Case Study 6** looks at the early impact of CLTS on two pilot villages in Timor Leste

Source: WaterAid West Africa. 2006. *Community Led Total Sanitation Manual*. Developed at the WaterAid West Africa Regional Workshop, Vandeikya LGA, Benue State, Nigeria, 20-29 November 2006.



Toilet built from local materials in CLTS pilot village, Timor Leste (see Case Study 6)

D. BAIRACHARYA

Understanding sanitation systems, choosing appropriate technologies

Smart Sanitation Solutions (NWP 2006) presents a range of innovative technologies for low cost sanitation. In choosing a technology, the five components of a sanitation system need to be considered:

Toilets: The primary barrier between people and pathogens, the designated place where excreta is collected. Options include dry toilets, such as various types of pit latrines and dry composting toilets, or wet toilets such as pour-flush latrines.

Collection: A facility which safely contains human excreta awaiting transportation, which may also include pre-treatment of excreta.

Transportation: A system of removing excreta which can not be treated or used on-site, including infrastructure-based systems such as sewer networks and regular transport such as trucks, vacuum tankers, carts and tricycles.

Treatment: The process of reducing pathogens in excreta to prevent infection of people and pollution of the environment. Treatment can happen on-site or off-site, and involves primary treatment, which reduces volume, weight and pathogens and secondary treatment, which reduces pathogens to acceptable limits.

Use of sanitation products: Reuse, recycling and recovery of materials and energy from excreta or wastewater. Excreta has high nitrogen and phosphorus content and thus has high fertilizer value. Excreta can be used as a soil conditioner and can also generate biogas for household cooking and heating. If excreta and/or wastewater can not be used, it must be disposed of safely.

Useful guides to choosing appropriate technologies:

Smart Sanitation Solutions, Netherlands Water Partnership, 2006.
Available at www.irc.nl

Philippines Sanitation Sourcebook and Decision Aid, WSP, GTZ and AusAID, 2006.
Available at www.wsp.org

Design appropriate responses

With the staggering range of technology options and approaches to promoting hygiene behaviour change, the one thing that is clear is that there is no one-size-fits-all approach. Indeed, a range of choices is necessary, with the selection of a sanitation

and hygiene intervention based on its appropriateness and acceptability for intended audiences and users, and in response to the needs and desires of different user groups (de Bruijne *et al.* 2007).

Defining sustainable sanitation

Good practice in sanitation has come to be closely associated with better understanding end users' needs and preferences, stimulating demand and improving the supply of a range of appropriate options. At the same time, there has also been a greater recognition of the need to think more holistically about the various dimensions of sanitation systems. The Sustainable Sanitation Alliance (SuSanA 2007) groups these into five key sustainability criteria:

- **Health**, including risks of exposure to pathogens at all points of the sanitation system; hygiene; nutrition and livelihood improvements; and downstream impacts;
- **Environment and natural resources**, including all the energy, water and other natural resources required for construction, operation and maintenance, as well as the degree to which recycling and reuse is practiced (e.g. through safe reuse of wastewater or composted material, recycling of nutrients for agriculture and production of renewable energies);

- **Technology and operation**, the functionality and ease with which the system can be constructed, operated and maintained using available human resources and materials, including technical design; robustness of the system; vulnerability to disasters; and adaptability of technical components to existing infrastructure and socio-cultural contexts;
- **Financial and economic issues**, the capacity to pay for sanitation, including investment; operation and maintenance costs; and the economic benefits of a system (e.g. through the use of recyclables for agriculture, employment creation, increased productivity and lowered public health expenditures);
- **Socio-cultural and institutional aspects**, including acceptance and expressed need; appropriateness of a system; user perceptions; gender issues; contributions to subsistence economies and food security; and legal and institutional aspects.



Locally designed 'ATloos' in Papua New Guinea (see Case Study 7)

All of the dimensions of sanitation should be considered when designing, implementing and assessing sanitation initiatives. There is clearly no single ‘sustainable’ model for all situations: a particular sanitation solution might fulfil the criteria to a great extent in one setting, but might be completely unsustainable in another.

Sustainable sanitation thus presents a framework or approach for assessing what works and what doesn’t work in a given context. While decisions will be context dependent, it is clear that learning about what works in one setting can help to inform decision-making in others.

Ecological Sanitation: A new paradigm?

Ecological sanitation, ‘eco-san’ or ‘eco-sanitation’ is an approach to sanitation which treats human excreta as a resource that can be recovered for use in agriculture.

Ecological sanitation is based on three fundamental principles:

- Preventing pollution rather than attempting to control it;
- Sanitising the urine and the faeces; and
- Using the safe products for agricultural purposes.

Ecological sanitation is based on the recovery and safe reuse of nutrients (nitrogen, phosphorus and potassium) from human excreta, and can be considered a sustainable, closed-loop system, in contrast with conventional approaches which dispose of nutrients in a linear flow. Benefits of the approach include the prevention of pathogens from entering the water cycle, reduced water consumption and improved agricultural productivity. The use of sanitised human fertiliser also reduces the demand for costly artificial fertilisers, thus addressing the need to curb the rapid depletion of global phosphorus resources.

Despite these potential benefits, there are numerous challenges to implementing ecological sanitation approaches in practice. In this case study collection, practical implementation of a number of ecological sanitation systems are discussed:

- **Case Study 2** looks at Plan in Vietnam’s experience with urine-diverting double-vault composting latrines.
- **Case Studies 5 and 9** explore the impact of practical trainings to promote the use of composting toilets in a number of Pacific Island Countries.
- **Case Study 8** discusses the construction and use of a biogas plant and French drain filter in Aceh, Indonesia.

Source: Winblad, U. and Simpson-Hebert, M. 2004. *Ecological Sanitation: Revised and Enlarged Edition*. Stockholm: Stockholm Environment Institute.

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A happy DVC latrine user (see Case Study 2)

The case studies



This collection of nine case studies explores sanitation initiatives in three countries in South East Asia (Indonesia, Timor Leste, Vietnam) and six Pacific Island Countries (Kiribati, Papua New Guinea, Fiji, Tonga, Tuvalu, Vanuatu). In each case study, the authors discuss various dimensions of these initiatives from social acceptability and financial aspects, to technical functionality and impact on the environment. All the case studies focus on practical implementation issues: from the challenges of training staff and community members, to the ways community engagement tools are used in practice, to the difficulties in designing culturally-appropriate hardware components.

The case studies are written from a variety of perspectives, taking into account the views of local and international NGOs, expert consultants and government agencies and highlighting the perspectives of end users and local community members. They present evaluations of work completed and reports on work in progress. The authors do not take a position on the 'best' method or approach for achieving sustainable sanitation, but rather illustrate what has worked or has not worked for them.

The following summary tables present an overview of the case studies. Table 1 provides a brief description of each case study and the key issues addressed. Table 2 highlights some of the common lessons emerging from the collection.



Table 1: An overview of the case studies

#	Case Study	Location(s)	Key issues highlighted					Description
			Health	Environment and natural resources	Technology and operation	Financial and economic	Socio-cultural and institutional	
1	Shifting the focus for sanitation in the Second Water and Sanitation for Low Income Communities Project	West Sumatra, South Sumatra, Bangka-Belitung, West Java, East Java, West Nusa Tenggara and South Sulawesi and West Sulawesi, Indonesia	✓			✓	✓	This case study examines how a large government project adopted the CLTS approach midway through project implementation. Early experience with CLTS indicates that it has achieved some remarkable results. The enabling factors for successfully making the switch to CLTS and the key issues related to scaling up and ensuring sustainability are discussed.
2	The sum is greater than the parts: An investigation of Plan in Vietnam's double-vault composting latrine program in northern Vietnam	Ha Nam and Nam Dinh Provinces, Vietnam	✓	✓	✓	✓	✓	In this case study, findings of an evaluation of Plan in Vietnam's urine-diverting double vault composting (DVC) latrine program are presented. Toilet usage, hygiene behaviour, design and construction standards and users' perceptions are explored. A key success of the program has been the design of a locally-produced urine-diverting pan, the 'Granito'. Recommendations include the need to better market the benefits of the DVC latrine to rural farmers.
3	Putting community development principles into practice: A case study of a rural water, sanitation and hygiene project in Vanuatu	Sanma Province, Vanuatu	✓				✓	This case study explores the extent to which the PHAST approach was utilised as participatory tool for community transformation in a rural water, sanitation and hygiene project. The authors conclude that care must be taken to ensure that tools like the PHAST approach are used as entry points to help mobilise community action and not interpreted simply as hygiene education sessions.
4	To their credit: How three Mekong Delta towns have used revolving funds to increase coverage of septic tanks	Bac Lieu, Ha Tien and Sa Dec, Vietnam			✓	✓	✓	This case study describes the process of setting up a revolving loan fund for septic tank toilets targeting poor urban households. The authors conclude that local sanitation loan schemes can be successful if proper training and capacity building for the loan disbursement group is undertaken, and if robust financial management, realistic loan parameters and support to borrowers and local suppliers is ensured.
5	The Sanitation Park Project: A regional initiative to increase participatory approaches in the sanitation sector	Sigatoka, Ba and Tavua Districts, Fiji		✓	✓		✓	This case study explores the use of a Sanitation Park as a demonstration site for exhibiting various sanitation technology options. The physical display of options and hands-on training in design and construction of a composting latrine were found to have clear benefits in terms of raising interest, skill levels and confidence.
6	A journey from subsidy to CLTS: The experience of WaterAid Australia and Plan in Timor Leste	Aileu and Liquica Districts, Timor Leste			✓	✓	✓	In this case study, experience with a project that subsidised latrine hardware in one rural district in Timor Leste is compared with the preliminary use of CLTS in another. The benefits and challenges of each approach are explored. Although only in its pilot stages, the author concludes that CLTS is already making an impact and presents a greater opportunity for increasing access to sanitation in rural areas.
7	A Toilet Paper: Reflections on ATprojects school sanitation in PNG	Eastern Highlands Province, Papua New Guinea	✓		✓		✓	In this case study, the author discusses the challenges associated with creating and maintaining momentum for a local NGO school sanitation and hygiene promotion program in a remote rural area. The program has designed its own hygiene promotion tools and children's games as well as a toilet, the 'ATLoo', which has created demand for household toilets in local communities.
8	Sustainable Sanitation: A new paradigm in Aceh, Indonesia	Banda Aceh, Indonesia		✓	✓		✓	This case study describes the use of a demonstration community toilet in a public park as a means of introducing new ecological sanitation concepts and technologies in a tsunami-affected area. Training in the construction of a biogas plant, which currently fuels the park's canteen, was accompanied by workshops on ecological sanitation and a wider community awareness raising campaign around health threats posed by failing septic tank systems.
9	Training in Eco-sanitation for communities in Pacific Island Countries	Tonga, Vanuatu, Tuvalu and Kiribati	✓	✓	✓		✓	In this case study, the author explores a number of ecological sanitation trainings and their impact on sanitation practice in four Pacific Island Countries. All the trainings aimed to provide communities with sufficient information and practical skills to choose, construct and maintain appropriate sanitation systems. Recommendations include the strong need for follow-up training and support, as well as the need to encourage local innovation in design and to plan trainings so that contradictory messages and programs are discussed.

Table 2: Sharing Experiences – Some key lessons from the case studies

Key Lessons	
Health	Financial and economic issues
<p>Knowledge of good hygiene behaviour does not necessarily translate into behaviour change in practice. Self-reported hygiene practices often do not correlate to observational data. In Case Study 2 Plan in Vietnam found that while over 90% of householders had adequate knowledge of good hygiene behaviours like hand washing with soap, 41% of households did not have any cleaning agents near their hand washing facilities. In the school sanitation and hygiene program in PNG (Case Study 7) a large increase in observed toilet usage was not accompanied by a similar increase in hand washing. Monitoring and verification of behaviour change can not rely solely on self-reported data, and hygiene campaigns must explore the reasons why people are (or are not) changing their behaviour and adapt their messages accordingly.</p>	<p>Microfinance schemes require a good deal of start-up support to build human and financial capacity. Credit schemes like the one described in Case Study 4 require detailed business planning, strong local financial management skills, strict loan parameters, careful assessment of borrowers and strong institutional support. Where these elements are lacking, such as in the ‘community revolving fund’ described in Case Study 1, financing schemes will have limited impact on sanitation improvement and are unlikely to reach financial sustainability.</p>
Environment and natural resources	Care must be taken to ensure that demand can be matched by adequate supply. Approaches like CLTS generate a great deal of initial demand for sanitation, which can often be met within a community. However, as households seek incremental improvements to their sanitation systems secure supply of affordable options can become an issue. Both Case Study 1 and Case Study 6 discuss the challenge of demand outstripping supply.
<p>In areas with high water tables and frequent flooding, potential for groundwater contamination can limit technology options. Septic tanks are frequently promoted as the most appropriate technology in such conditions, yet septic tanks are often poorly constructed and maintained, are unsealed or lack secondary treatment. Whilst septic tanks may present the best option in some settings, for example in densely populated urban areas (see Case Study 4), much more emphasis is needed on ensuring households are able to maintain their systems and are aware of the environmental health risks associated with failing septic tanks (see Case Study 8).</p>	<p>Training local suppliers can help to promote sanitation and generate income. People trained in constructing latrines and manufacturing latrine parts have an incentive to generate demand for their products and services. Once trained, local labourers seek to become ‘recommended’ suppliers (see Case Study 4, Case Study 8). Local producers can be active promoters, as in Case Study 7 from PNG, where local women are helping to advertise the household ‘ATloos’ they make in order to earn more income.</p>
Ecological sanitation presents a range of sustainable alternatives, but these often require more education and promotion. If the technology is new to a community, for example the biogas plant in Indonesia (Case Study 8) or composting toilet systems in the Pacific (Case Study 9), a good deal of training and education is needed. This takes time and requires adequate follow-up. If such approaches are already accepted, such as the use of human fertiliser in Vietnam (Case Study 2), considerable promotion and marketing may still be necessary to change public perceptions that these technologies are inferior to septic tanks or other ‘higher’ technologies.	Socio-cultural and institutional aspects
Technology and operation	Local champions are the key to uptake and sustainability. Most of the case studies highlighted the role that local leaders play in building demand for sanitation and ensuring continued support within communities. The role of local champions is particularly critical to the CLTS approach, as discussed in Case Study 1. Whether they be village chiefs, school headmasters, government officials or natural leaders, local champions are vital to galvanise support and convince sceptics, as well as to sustain momentum for change.
<p>Hands-on training in design, construction, operation and maintenance is essential, and should include adequate follow up. Once people have had the opportunity to see a system first-hand and experience its benefits, they are more likely to invest their own time and resources. Several of the case studies discuss the benefits of practical training, both in building demand for sanitation and in ensuring that community members gain confidence. Both Case Study 8 and Case Study 9 highlight the fact that once people are familiar and confident with a technology, they are able to adapt and improve upon it to suit their needs.</p>	<p>Women play a critical role. Not only do women emerge as champions and natural leaders in the promotion of sanitation (see Case Study 1 and Case Study 4), their role in ensuring the upkeep of household sanitation systems is essential, as women are often responsible for cleaning and maintaining them. Women often place a greater value on sanitation, so when their voices are not heard, as illustrated in Case Study 3 from Vanuatu, the potential for community change is greatly reduced.</p>
<p>Local innovation in latrine design and construction can produce cheaper and more appropriate options. Latrine designs should be tailored to their end-users. Case Study 7 describes the process of designing the household ‘ATloo’ in PNG, where research on how local men, women and children use the toilet was used to determine appropriate dimensions of the pit hole and slab. Sourcing latrine parts locally greatly reduce their cost, as with the locally manufactured ‘granito’ toilet pan described in Case Study 2. The CLTS approach (Case Study 1 and Case Study 6) also illustrates how a ‘no subsidy’ principle can help foster local innovation and the development of very low cost toilets.</p>	<p>Maintaining the quality and integrity of facilitator training is essential. Community development approaches like CLTS and Participatory Hygiene and Sanitation Transformation (PHAST) rely on the ability of skilled facilitators to assist communities in addressing their own sanitation situations. Case Study 1 and Case Study 6 stress the importance of the facilitator’s attitude when attempting to ‘trigger’ a community to stop open defecation. Case Study 3 explores the critical role that proper facilitator training can play in ensuring that tools like PHAST are used appropriately.</p>

1 Shifting the focus

for sanitation in the Second Water and Sanitation for Low Income Communities Project

Nina Shatifan, WSLIC 2 Project

The Context

Across the region, politicians and policy makers have been slow to recognise the enormous economic and health costs of millions of people living in faecally contaminated environments. Diarrhoea and typhoid are two of the four major killers for children under five in Indonesia (Ministry of Health 2002). Meanwhile, over 40% of the rural population continue to defecate in their rivers, lakes, padi fields, ponds, canals, ocean and forests with devastating effects.

However, sanitation policy is taking a new turn in the country, inspired in part by the Millennium Development Goals (MDGs). For the first time, the Indonesian Government has set a target of reducing by half the proportion of people without access to improved water supply and basic sanitation in line with the MDGs. This means increasing the coverage of people using improved toilets¹ from 122 million in 2000 to 176 million by 2015.

Much of this effort is being driven through large-scale national Water Supply and Sanitation (WSS) projects using Community Led Total Sanitation (CLTS) that is rapidly transforming the way sanitation is addressed. This is in contrast to conventional approaches such as hardware subsidies for household toilets, revolving funds, demonstration and communal toilets.

This case study describes how CLTS has been introduced into a large scale water and sanitation program, Water and Sanitation for Low Income Communities 2, half way through its implementation. The case study identifies the conditions that have supported and hindered this turn around in strategy and discusses the lessons learned from the institutional and project adaptations that took place.



Triggering in Desa Orabua Selatan in District Mamasa, West Sulawesi

N. SHATIFAN

The Process

The Second Water and Sanitation for Low Income Communities project (WSLIC 2) is a second generation community-driven water and sanitation program which started at the end of 2001. It will have reached almost 2500 villages in 35 districts in eight provinces² when it finishes in December 2008. Funding is from a World Bank loan, an AusAID grant, national and district government budgets and community contributions (total AU\$159 million).



Sanitation Coverage: Indonesia		
Total:	Rural:	Urban:
55%	40%	73%

JMP 2006

Acknowledgements

I would like to thank Mike Ponsonby (Team Leader), Pak Sudjarwo (CLTS Advisor) and Pak Sudardjo (Participatory Health Promotion) from the WSLIC 2 project for their insightful comments on the case study. This story reflects the deep commitment of local champions from both national and local governments and communities for which they deserve full recognition. I acknowledge the work done by the Water and Sanitation Program (East Asia and Pacific) in facilitating the first CLTS trials that led to WSLIC2 changing its strategy mid-stream and the subsequent report that is a useful source document. I would also like to acknowledge Kamal Kar for the major contribution he made in promoting the potential value of CLTS in Indonesia. This in turn triggered significant institutional change in which CLTS became a national community-based approach to rural sanitation.

¹ Economic losses due to inadequate sanitation alone have been estimated at 2.4% of GDP (ADB, 1998)

² West Sumatra, South Sumatra, Bangka-Belitung, West Java, East Java, West Nusa Tenggara and South Sulawesi and West Sulawesi.

Essentially, the WSLIC 2 project tries to strengthen people's ability to plan, finance, implement and manage their water and sanitation facilities, improve environmental sanitation and hygiene practices and work more closely with local agencies so they can manage and use their services in a sustainable way. In the beginning, the project used a 'community revolving fund' which provided each community with up to 25 million rupiah (AU\$3378) to manage a small loans scheme for sanitation improvement. This did not work well, partly because of lack of clarity about how much money was available and how it could be used and no planning for achieving total coverage within a 3-5 year period (Ponsonby *et al.* 2004).

Facilitators often did not continue to work with villages to address increased demand for toilets once people had improved water systems because they felt obliged to move to new villages to meet water supply targets set by the project. Often a limited range of unaffordable technology options for the poor was promoted with no ceiling on how much could be borrowed. So while notionally poor households were to be the main beneficiaries (which did happen in some cases), in practice funds were slow to be repaid and better off households mostly benefited. To encourage more poor households to apply for funds, the project set a borrowing ceiling of 200,000 rupiah (AU\$27) in July 2005 and produced an Informed Choice Catalogue with information on a sanitation ladder of options for different geographic conditions. Even so, sanitation improvements remained limited.

Integrating CLTS into WSLIC 2

At the end of 2004, CLTS came to Indonesia. Highly impressed by what they had seen during a CLTS exposure visit to India and Bangladesh, a group of Indonesian government officials were ready to try it out. WSLIC 2 was one of two projects to trial CLTS in four districts starting in May 2005 together with two districts in an ADB project. By May 2006, 17 WSLIC villages in the trials achieved 100% open defecation free (ODF) status, increasing access for around 5,374 households. In 2006 six more WSLIC 2 districts started using CLTS and at the start of 2007 the revolving fund strategy was replaced by CLTS for all new project villages in 33 provinces.

Making this shift required a number of steps for the project team:

- **Getting local buy-in of decision makers** through promotion to district decision makers, particularly heads of local health departments, sharing 'success stories' by champions in pilot areas and helping people to grasp the 'no subsidy' concept.
- **Revising project policies and documentation** to reflect the new approach and disseminating these to district teams.
- **Revising the project's community process** to include CLTS.
- **Building capacity** including new training programs, manuals to support CLTS implementation, training core teams of trainers (TOT) and community facilitators to implement CLTS.
- **Revising project monitoring systems** to reflect new measures for increased access rather than number of toilets built.
- **Collaborating with local agencies** to encourage them to integrate CLTS into

their current responsibilities, particularly the sub-district health centres (*Puskesmas*).

- Developing **systems for verification and declaration and monitoring**, which has been challenging and is still in progress.

The Impact

By August 2007, 31,400 households had obtained access to toilets, which is around 156,995 people (using an average of 5 persons per family). A total of 33 whole villages and 2 sub-districts in the WSLIC 2 project became 100% open defecation free without any external household subsidies. This is a significant achievement, given that no village had achieved 100% sanitation coverage in the previous three years of project implementation. Three impacts are already apparent from using CLTS, including community empowerment, sustainability and scaling up.

Community Empowerment

CLTS is a dynamic and effective way to build community confidence in its own ability. The no subsidy approach and promotion of low cost options directly reaches and benefits the poor while the process inherently demands transparency and accountability. To achieve 100% ODF, everyone in the community is held accountable for the results. Spin offs as a result of this empowerment are evident. For example, during a celebration to mark achieving 100% ODF, one community demanded that the district head provide support to improve the village roads to which he signed up on the spot, recognising the community's ability to take charge of its own affairs. The question now is how best to harness this empowerment impact for further community improvements.



Community triggering in Desa Orabua Selatan: In 3 days, one hamlet became 100% ODF, increasing access from 3 to 23 households

N. SHARIFAN



Community mapping during triggering in Desa Orabua Selatan

N. SHAFITAN

It is also apparent that compared with traditional approaches women are more active in CLTS, particularly poor women. They are emerging as champions and natural leaders, be they medical professionals, teachers, midwives and health volunteers, members of women's prayer groups or heads of local women's groups. In one district, women have been trained in toilet construction – a first for the district. To support this, CLTS facilitators need gender analysis skills to be able to capitalise on women's interest in sanitation and facilitate community discussions on gendered roles, such as who will take on responsibility for maintaining the new toilets and carrying additional water.

Responding to demand

Most householders build their latrines and help others in need (i.e. elderly, widows, disabled). CLTS has not only triggered new toilets but also improvements to existing ones (moving up the sanitation ladder). Technical advice and training is provided by WSLIC facilitators, including for women, in at least one village in West Sumatra. Production of toilet pans by villagers is usually at cost as a community service rather than for profit. In some cases, demand does outstrip supply and this critical issue, together with options for latrine improvement, is being addressed in a Total Sanitation program funded by the GATES Foundation in East Java.

Sustainability

While the WSLIC 2 project teams have enthusiastically taken up the challenge of 'triggering' villages, more effort is needed for follow up support including technical advice to help community groups to deal with resisters, resolve technical problems (like constructing toilets in dense settlements), monitor progress and develop verification and declaration systems (for 100% ODF). It is important to keep the focus on outcomes rather than outputs and this requires an attitudinal shift amongst project staff away from hardware targets. We continuously reiterate to community facilitators and project staff that CLTS is a transformational tool focused on longer term change for a range of sanitation improvements, including upgrading of simple toilets over time, rather than seeing ODF as yet another target.

Implementing CLTS, a community-driven process approach, can conflict with the target driven outputs of a water supply project. It is important to develop and resource institutional strategies that can move CLTS beyond the project into mainstream programs.

Scaling up

In promoting local innovation and response, CLTS fits well with a decentralised project like WSLIC 2. Districts have been able to develop institutional arrangements and strategies for scaling up CLTS beyond the project that fit with local conditions. In West Sumatra, for example, the local health department is targeting the *nagari* (a traditional cluster of villages) as the 'community' for ODF and working closely with the *Desa Wisma* (clusters of 10 households). Other districts have chosen to target a few sub-villages (*dusun*) and to

target all households as one group to become 100% ODF and then extend out to the village level.

Getting district heads (*Bupatis*) enthused about CLTS and moving the approach to the broader social and economic development arena beyond health would strengthen the impact and aid in scaling up the approach more quickly. One Bupati for example is spreading CLTS through a range of extension services outside of local health agencies.

As a result of the positive results of CLTS, the Minister for Health declared CLTS as the national approach for rural sanitation in late 2006. This has now been incorporated into a national operational strategy for Total Sanitation as part of scaling up and some 200 districts will be implementing CLTS in 2008.

Lessons

It is early days for CLTS in WSLIC 2 and in Indonesia. To move beyond the initial successes requires widespread discussion and analysis about different ways of mobilising stakeholders, including women and the poor, encouraging community ownership and strengthening external support mechanisms. Here are some lessons that have already emerged in the past two years in WSLIC 2:

- WSLIC 2 districts sometimes faced early resistance as officials and communities wanted to continue with a subsidy approach. However, once they realised that CLTS would bring fast results at low cost, this resistance mostly dissipated. Trying to implement CLTS where subsidy programs are also being implemented is confusing and can undermine efforts for community self-help.

- It is important to maintain the quality and integrity of the facilitator training. WSLIC 2 uses a cascade approach from national to community level with training of 3-4 days, including one day in a community. It takes this amount of time to shift people's mind sets. Community facilitators are often sceptical about CLTS at first and so are surprised when they witness the speed of change in communities even during the 'field practice'. This alone strengthens their commitment to the approach.
- Inviting senior government officials like the Minister for Health and provincial and district heads to witness 'declaration ceremonies' where communities formally announced achievement of 100% ODF has worked well in getting top level support for policy change.

- Champions are the key to the success of CLTS, at all levels of government and in the community. Dr. Purnama Augustine, the head of the health centre in Lembak sub-district of Muara Enim in South Sumatra spearheaded the CLTS effort and trained all of her staff (including the drivers) to facilitate CLTS. Thanks to these efforts, 16 of the 18 villages in her sub-district are now 100% ODF and the two remaining villages are almost there.
- It is clear that different conditions affect results. These include geographic and cultural factors (e.g. level of community homogeneity), proximity to readily accessible alternatives for defecation (e.g. rivers, ocean), commitment of community leaders and local champions and past experience or expectation of some form of subsidy³. Assessing existing conditions helps to develop strategies for introducing CLTS to a district, sub-district or community.
- CLTS provides an entry point for greater cooperation between government, civil society and the private sector to scale up demand, increase supply and promote sustainability without using subsidies. More attention is needed on using civil society groups and natural leaders for scaling up, improving monitoring systems and the rural sanitation sector⁴.
- Sanitation with hygiene promotion needs to be given higher priority in WSS programs so that it does not continue to be given secondary importance to water supply systems. Evaluations of staff and contracted consultants should measure their performance in improving access to sanitation and behaviour change as much as completion of water supply systems.

Conclusions

WSLIC 2 was well under way when CLTS was introduced with systems in place and everyone trained for the revolving fund approach. The change to a new approach was helped by the following:

- Commitment of the senior staff from the Department of Health and WSLIC 2 management office to undertake the field trials based on their experiences from the study visit to India and Bangladesh;
- Demonstrated results from the field trials, which proved CLTS could deliver results quickly without any funds for hardware subsidies, resulted in a declaration from the Minister for Health that CLTS would be the rural sanitation approach to be adopted by the Department of Health;
- Phasing of CLTS into the project provided opportunities to learn lessons, develop a group of experienced trainers and facilitators and in some way created a sense of urgency among other WSLIC districts to start with the CLTS approach so they would not be left behind; and
- Continuing support, advocacy, training and monitoring by the Water and Sanitation Program (East Asia and Pacific) which assisted the Department of Health in developing their plan of action for scaling up CLTS.

There is not doubt WSLIC 2 has played a key role in getting CLTS accepted in Indonesia and encouraging other districts to adopt the approach. While CLTS in Indonesia was initiated by the national government, the approach has since been taken up by large religious and other non government organisations, a move that can only increase the momentum for scaling up.

The CLTS approach will reap most benefits when it is taken up by civil society and becomes a people's movement. So as the WSLIC 2 project comes to an end, district agencies need to find ways of reaching out to other players including civil society organisations, champions, natural leaders and the private sector to speed up this process.

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Further Reading

CLTS on the Institute for Development Studies (IDS) website: www.livelihoods.org/hot_topics/CLTS.html



Natural leader explaining a low cost option for toilets in Mamasa

N. SHATIFAN

³ These are drawn from favourable and unfavourable conditions identified by Dr Kamal Kar and Prof. Robert Chambers, based in part on their field trips and discussions in Indonesia (see CLTS website at www.livelihoods.org/hot_topics/CLTS.html).

⁴ A new initiative will add to this learning. The GATES foundation is supporting a large-scale, sanitation program in four countries including Indonesia to stimulate the demand and supply of sustainable sanitation services and reach the poorest in rural villages, small towns and informal urban settlements.

2 The sum is greater than the parts:

An investigation of Plan in Vietnam's double-vault composting latrine program in northern Vietnam

Ben Cole, Environmental Health Consultant; Pham Duc Phuc, National Institute of Hygiene and Epidemiology; and John Collett, Plan in Vietnam

The Context

The Government of Vietnam has recognised the urgent need for progress in the construction and maintenance of hygienic sanitation facilities in rural Vietnam (Socialist Republic of Vietnam 2006). A country wide survey of sanitation facilities in rural Vietnam found 25% of households had no latrine and a further 19% possessed an unhygienic latrine (Ministry of Health and UNICEF 2007). In response to the low coverage of sanitation the Government of Vietnam has established a target of constructing 2,600,000 hygienic latrines by 2010 (Socialist Republic of Vietnam 2006). Attaining this target will require the development of a sustainable market for affordable, socially acceptable and technically appropriate sanitation options.

The Government of Vietnam has stipulated the double-vault composting latrine (DVC latrine), septic tank latrine, pour-flush water sealed latrine and ventilated pit latrine as hygienic sanitation options (Ministry of Health 2005). Since the 1950s, the DVC latrine has been advocated as an appropriate sanitation facility throughout rural Vietnam (Jensen *et al.* 2005). It is estimated that 25% of Vietnam's rural population possess a DVC latrine (GSO 2004).

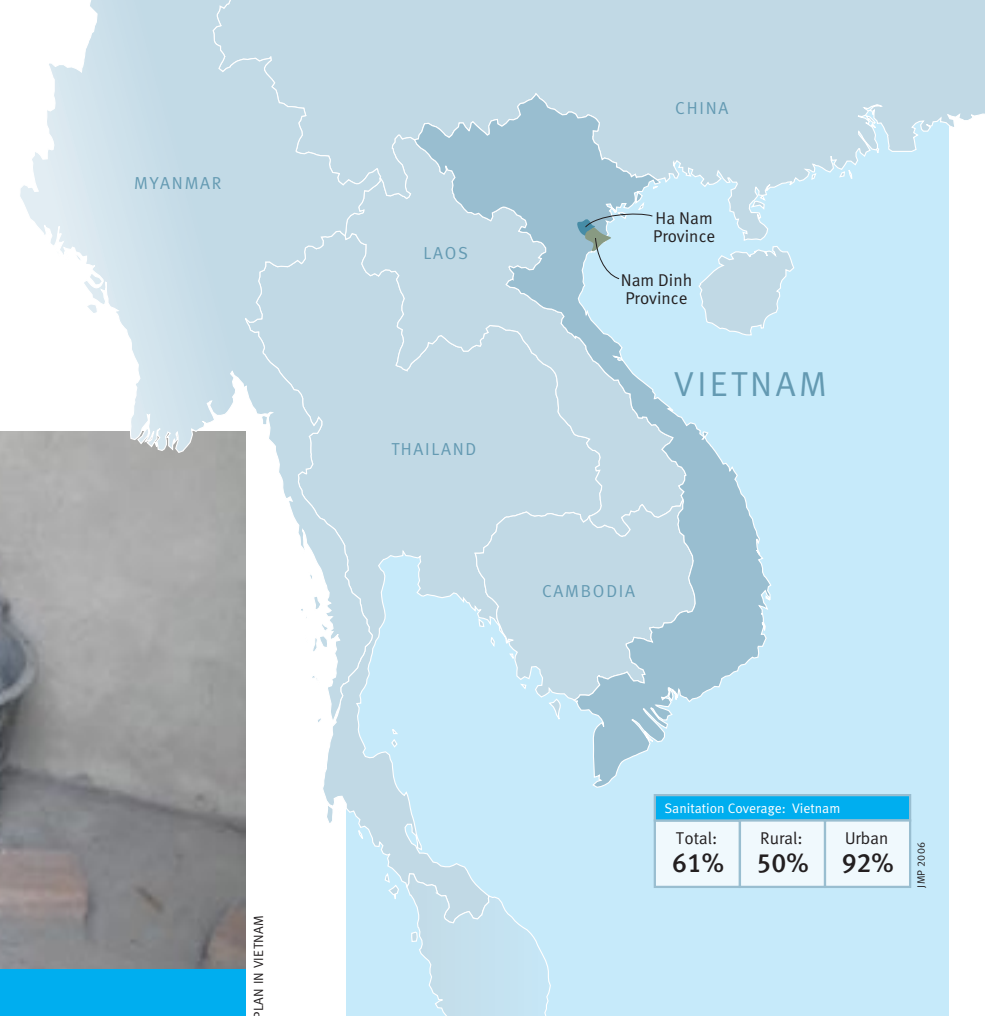
Farmers in Vietnam and China have been applying human excreta as fertiliser and soil conditioner for centuries (Jensen *et al.* 2005).



Burning toilet waste-paper before disposing in latrine

DVC latrines are popular in Vietnam as they provide a source of human excreta as fertiliser and soil conditioner. While the use of human excreta can increase the water-holding and ion-buffering capacity of soil, if used in an untreated form, it can also increase the risk of exposure to faecal pathogens (Jonsson *et al.* 2004). The risk of exposure is reduced through establishing the correct physicochemical and biological factors in the DVC that result in pathogen die-off in the excreta combined with correct handling procedures (Schonning and Stenstrom 2004).

The most popular and desired sanitation options in Vietnam are the septic tank latrine followed by the DVC latrine (Ministry of Health and UNICEF 2007). Ecological sanitation facilities such as DVC latrines have been advocated by development and government agencies as they save water, prevent ground-water pollution and recycle nutrients in human excreta (Winblad and Simpson-Hebert 2004; GTZ 2007). Understanding the consumer's motivations and barriers towards the purchase and management of DVC latrines will provide important information in the development of future sanitation programs in Vietnam.



Acknowledgements

We would like to thank the 120 families that welcomed us into their homes during this investigation. We hope their time spent with us will contribute towards developing and implementing successful DVC latrine programs in Vietnam. We would also like to thank Mr. Chinh (Plan in Vietnam's Nam Ha Program Unit Manager) and Mr. Hung (Plan in Vietnam's Nam Ha Program Unit Water and Sanitation Consultant) for their ongoing support throughout the investigation. This research would not have been possible without the assistance of local research assistants and Plan volunteers. Many thanks must go to them for their insight and guidance during the field visits. Finally thanks to Peter Feldman for reviewing and editing the drafts of this case study. This investigation was financially supported by Plan in Vietnam.

The Process

Plan in Vietnam's DVC latrine program

Since 1995, Plan in Vietnam (Plan) has promoted hygienic household sanitation in seven provinces, with a strong focus on urine diverting DVC latrines. Over 11,000 household latrines have been constructed with Plan support during that time. Plan's Nam Ha Program Unit (NHPU) has constructed over 8,000 DVC latrines during this time, in 192 villages located throughout 14 communes¹ in Ha Nam and Nam Dinh provinces. These provinces lie approximately 80 kilometres south of Hanoi, and have a combined population of over 800,000 people.

The total cost of constructing a typical DVC latrine ranged from 1,100,000 to 1,500,000 VND (US\$ 68.92); Plan provided a subsidy of 700,000 VND (US\$ 43) to participating households. Based on the high rates of participation it was assumed this level of subsidy was acceptable to the householders.

Investigation process

This case study is based on the findings of an investigation that took place in Ha Nam and Nam Dinh provinces during May and June 2007. The objectives of the investigation were to assess DVC performance and user attitudes, to identify any design or construction concerns, and to make recommendations for remedial actions, if necessary.

The investigation assessed 120 households in three communes (Chinh Ly, Don Xa and Yen Thanh). Field data collection included detailed physical inspection of each DVC latrine at the selected households, as well as semi-structured interviews with one or more household members. The research team also conducted in-depth interviews with Commune Health Workers, Women's Union staff, Commune People's Committee (CPC) staff, Plan staff and Plan volunteers, and household members in each of the three communes to further understand the attitudes and perceptions towards DVC latrines.

General Findings

The investigation found a high proportion of households (97%) used their DVC latrine regularly and the latrine was maintained in a good condition (97%). An overwhelming majority of households (91%) expressed satisfaction with their DVC latrine.

Women were found to be more than twice as likely as any other household member to bear responsibility for cleaning the DVC latrine, removing contents from the vaults, and emptying the urine jar. After emptying the vaults the majority of households (63%) immediately use the contents as fertilizer. The remaining households engaged in some form of secondary composting of the excreta. Most households (61%) reported using urine on leafy crops and garden trees located close to their DVC latrine.

Successes

The 'Granito': An affordable, locally manufactured DVC pan

A significant innovation by Plan in the NHPU latrine program was the introduction of a low-cost, locally manufactured, double-hole pan.

The pre-moulded pan, dubbed the *Granito*, was collaboratively developed by Plan and Ha Nam's Center for Rural Water Supply and Sanitation (CERWASS²). The *Granito* is manufactured from cement and has a polished surface.



Uninstalled *Granito* pan



Installed *Granito* pan with two covered defecation holes

¹ Provinces in Vietnam are sub-divided into districts, and districts are sub-divided into communes. Communes typically comprise 5-10 villages.

² CERWASS is a government agency that implements water supply and sanitation programs in Vietnam.

Prior to the production of the *Granito*, the only manufacturer of pre-moulded double-pans was located in Hanoi and produced pans that cost 165,000 VND (US\$ 10). The locally manufactured *Granito* was produced for 70,000 VND (US\$ 4.30). Use of the *Granito* resulted in significant cost savings for Plan's DVC latrine program.

The *Granito* dramatically improved the consistency in construction standards of the DVC latrines. The *Granito* was reported by households to be easy to clean and to reduce seepage of urine into the concrete thereby reducing odours.

Challenges

Technical

The investigation identified four key as-built construction concerns: 1) narrow and inappropriately located vent pipes; 2) absence of lids covering the defecation holes; 3) poor sealing of vault doors; and 4) uncovered urine collection jars. Poor design as well as limited understanding on the part of masons regarding the principles of DVC latrine construction were identified as the primary causes of these technical concerns.



Applying diluted urine in vegetable garden close to the latrine

PLAN IN VIETNAM

Behavioural

Seventy-three percent of households reported they emptied the contents of the vault 1-2 times per year. Content removal often occurred prior to rice planting (February and June). This suggested that vaults were often emptied before the recommended six-month storage time. Previous studies have also indicated that a minority of households compost their human excreta for the recommended six months (Ministry of Health 2003). Ash was observed in the majority of DVC latrines (83%) suggesting householders added ash to the vault contents.

Nearly all of those interviewed (more than 90%) had adequate knowledge of good hygiene behaviours such as hand washing with soap at critical times (such as after defecating, preparing food, and handling babies' faeces). However, self-reported practices did not correlate to physical observations, which found that 41% of households did not have any cleaning agent in close proximity to hand washing facilities. This suggests that use of cleaning agents during hand washing after defecation was lower than reported. Commune Health Workers in the project area agreed that knowledge of correct hand washing behaviour was generally good, but that this did not seem to translate into practice³.

Most households with a DVC latrine (78%) stated that they would prefer to upgrade to a septic tank latrine.

Social

Survey and interview data suggest that there has been low "uptake" of DVC latrines by households outside of the Plan-supported program area. Most households with a DVC latrine (78%) stated that they would prefer to upgrade to a septic tank latrine. Households that had not been part of the Plan DVC latrine program often stated they would rather wait until they had enough savings to build a septic tank latrine than purchase a less costly DVC latrine in the short term. The most common justification for this attitude was that septic tank latrines were the most hygienic latrine available. From these findings it was concluded that changing perceptions regarding DVC latrines will be a major challenge to scaling up demand for DVC latrines in northern Vietnam.

Users' Perceptions of the DVC latrine

- In-depth interviews with parents and school teachers reported that some children didn't like the strong odours and numerous flies that surrounded the *Granito* and non-*Granito* DVC latrines during the hot summer months.
- The study didn't ask women about their use of the *Granito* during menstruation. Anecdotally we were told that women use reusable fabric pads and do not dispose of them into the DVC vault.
- Interviews found men rarely used the DVC latrine when only urinating. The interviewed men stated they urinated directly onto their garden and crops or into the urine collection jar behind the DVC latrine.



A DVC latrine in Tan Kim commune, Thai Nguyen Program Unit

PLAN IN VIETNAM



Cleaning the DVC latrine

PLAN IN VIETNAM

³ Research commissioned by the National Handwashing Initiative in Vietnam found that 60% of respondents who washed their hands with water did not believe it was necessary to use soap. The key barriers to using soap were identified to be: a) Fatalistic acceptance of illness (and the feeling that risks are low) and b) That dirt and germs are visible (Indochina Research, 2006).

Recommendations

Technical

Four low-cost technical improvements are recommended for the construction of DVC latrines in the program area: 1) vent pipes should have a minimum diameter of 90mm; 2) simple locking systems should be installed for vault doors; 3) lids for defecation holes should be clearly identified to distinguish the *in-use* and *storage* vault; and 4) urine collection jars with lid should be part of the latrine ‘package’. The NHPU Water and Sanitation Consultant stated the *Granito* could be improved by increasing its length for greater comfort of the users and less likelihood of urine splashing onto the concrete floor.

The DVC latrine design was found to be lacking in some key areas, for example the recommendation to install narrow vent pipes. Compounding this, anecdotal evidence indicates masons had a low understanding of the principles of constructing a DVC latrine. Greater emphasis should be given to training masons on the principles of composting latrines; for example, understanding the importance of airflow over the compost pile to facilitate the aerobic composting process and to remove bad odours.



Example of vault doors with a simple locking system

PLAN IN VIETNAM

A key challenge to scaling up this program will be changing the public’s perception that DVC latrines are less hygienic than septic tank latrines. Improvements in DVC latrine construction and marketing approach could greatly enhance their appeal and ensure their continued (and renewed) popularity.

Behavioural

DVC latrines require regular maintenance to ensure that they function properly (and hygienically). Results of this investigation suggest that more effective behaviour change communication (BCC) will be needed to ensure that the construction, use and maintenance of DVC latrine systems is optimised. Target audiences for such BCC include local masons, occupants of households with DVC latrines, and Plan staff and volunteers. Attention should also be given to gender specific roles and attitudes towards household sanitation. Key messages should be reduced to a small number of simple steps (e.g. five) for building and maintaining hygienic, odour- and fly-free DVC latrines⁴.

BCC and other activities and incentives to encourage households to construct a hand washing place in close proximity to the latrine, hand wash at proper times and to use cleaning agents such as soap, washing powder or detergent should be included in future DVC latrine programs. Implementing agencies could consider methods such as linking payment of the latrine subsidies to evidence of improved hygiene practices in the home.

Early removal of the contents of DVC latrine vaults is another area of potential health concern. Previous research has shown that farmers using DVC latrines often remove the contents according to their cropping patterns rather than according to the six-month storage time recommended by Vietnam’s Ministry of Health (Phuc *et al.* 2006). However, there is some debate as to whether a full six months is required to neutralize pathogens in a DVC latrine. Jensen (2006) found that three months storage time and the regular application of lime resulted in 97% neutralisation of pathogens in human excreta. Further research and a review of government guidelines for DVC latrine operation are recommended in order to clarify the guidance needed for hygienic DVC latrine operation in Vietnam.

⁴ Recommendations for an updated BCC strategy are included in the final project report for this investigation, and are available from Plan in Vietnam

Comparison of advantages and disadvantages of DVC latrines vs. septic tank latrines

	Advantages	Disadvantages
Double-vault composting latrine	<ul style="list-style-type: none"> • Vietnamese farmers perceive excreta as a valuable fertiliser • Low construction costs • Excreta (when safely composted) is a useful soil conditioner • Urine provides a rich source of nitrogen and phosphorous • Water not required for use • Can be built in areas with high water tables and rocky soils 	<ul style="list-style-type: none"> • In common with all latrines, if poorly constructed or maintained, can attract flies and cause bad odours • Early removal of faeces can lead to exposure to pathogens • Requires periodic maintenance and management including removal of composted faeces from vault
Septic tank latrine	<ul style="list-style-type: none"> • Odourless due to water seal between the stored excreta and the inside of the latrine • Low maintenance required when operating correctly 	<ul style="list-style-type: none"> • Higher capital costs associated with ensuring adequate supply of water for flushing • Susceptible to blocked underground pipes which are difficult to repair • Costly emptying of septic tanks required periodically – specialised equipment and service personnel needed • Leachate and leakage from tanks can cause ground water pollution and is a potential human health hazard • Large volumes of water required for flushing • No benefits from use of urine or decomposed faeces as fertilizer



Plastic, pre-moulded, single-hole pan used in Plan China's sanitation program

PLAN IN VIETNAM

Social

The majority of households interviewed wanted a septic tank latrine more than a DVC latrine. Future marketing messages for the DVC latrine should focus on their many advantages, including cost-effectiveness and beneficial (and hygienic) use of excreta as fertilizer (see table). Other activities that could change perceptions regarding DVC latrines include promoting 'higher end' modifications such as floor tiling; and encouraging construction of the DVC latrines inside or adjacent to homes.

Ecological sanitation programs have utilised other modern types of plastic pre-moulded pans. For example, Plan China's sanitation program recommends the use of a plastic, pre-moulded, single-hole pan (P Kumar 2007, pers. comm., 20 June). The introduction of plastic pans could be a design improvement over existing pans in Vietnam as they are cheap to transport and manufacture, strong and easy to clean. The use of plastic pans may also reinforce the perception of the DVC latrine as a modern and hygienic sanitation option.

Conclusion

Overall, Plan's DVC latrine program was well received by participating households. Performance of these DVC latrines could be significantly improved through several low-cost technical modifications that would improve composting, and reduce odours and flies. A key challenge to scaling up this program will be changing the public's perception that DVC latrines are less hygienic than septic tank latrines. Improvements in DVC latrine construction and marketing approach could greatly enhance their appeal and ensure their

continued (and renewed) popularity as perhaps the most ecologically sound and affordable household sanitation option currently available in many parts of Vietnam.

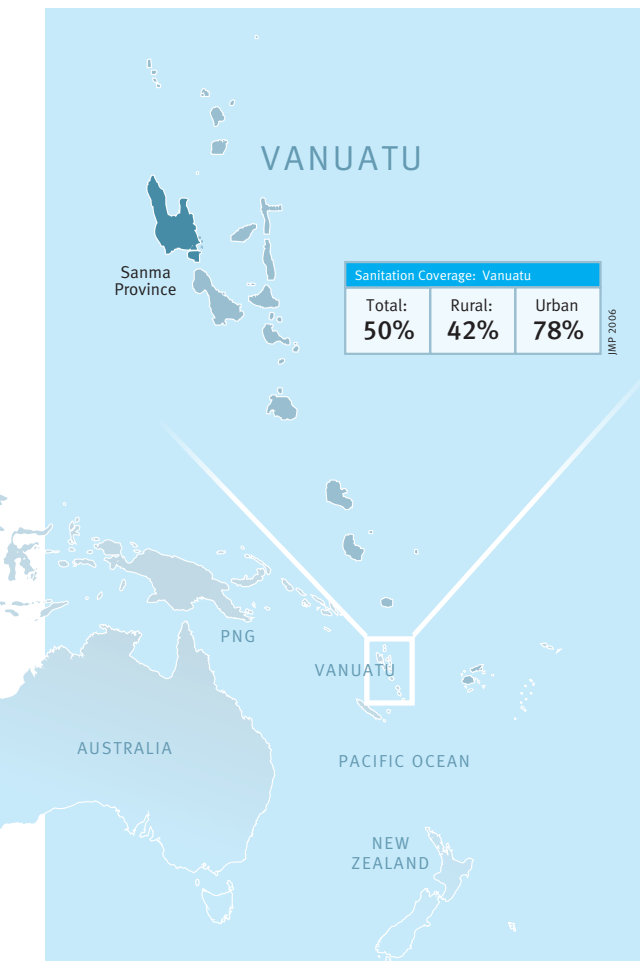
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3 Putting community development principles into practice:

A case study of a rural water, sanitation and hygiene project in Vanuatu

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The Context

In rural areas of developing countries such as Vanuatu¹, the majority of people do not have year-round access to safe water and improved sanitation. The Vanuatu national estimate for rural access to safe water in 2004 was 52% and to improved sanitation was 42% (WHO and UNICEF 2004). Nationally, diarrhoeal disease was reported as accounting for 11% of all deaths in children under five from 2000-2003 (WHO 2006). Skin disease, worms and diarrhoea are the third, fourth and fifth leading causes of morbidity respectively and impact on peoples' health, dignity and productivity. In response, the Vanuatu government's Master Health Plan 2004-09 identifies reducing diarrhoeal diseases as a priority to improve the health status of the people of Vanuatu. The issue of water and sanitation in rural Vanuatu has also been identified by World Vision Vanuatu as a sector within which World Vision can partner with local communities to effectively and positively enhance life quality.

For World Vision, community development as reflected in its holistic model of transformational development is a process of people taking control of their situations, identifying their most critical needs, and working together to find solutions. Across many of the countries World Vision works in and more recently in the Pacific, Participatory Hygiene and Sanitation Transformation (PHAST) has been increasingly utilised. PHAST is a participatory development approach to promote hygiene behaviours, sanitation and hygiene improvements and community management of water and sanitation facilities (Wood, Sawyer, Simpson-Hebert 1998). The PHAST approach aims to take people beyond consultation or information giving and allows them to be masters of the solution. In principle, it facilitates a shift from technical interventions measured in terms of targets built or met to participatory development whereby success is measured in terms of communities being organised and active in setting and achieving their goals.

To promote change is to offer communities ways to take more control of their development, not just participate in it.

Simpson-Hebert, Sawyer and Clarke, 1997

PHAST

Participatory Hygiene and Sanitation Transformation (PHAST) is a participatory approach to the control of diarrhoeal disease. It is a methodology for those seeking to help communities improve hygiene behaviours, prevent diarrhoeal diseases and encourage community management of water and sanitation related diseases. It uses specific adult learning tools developed in each context to facilitate a process with community groups to discover for themselves the faecal-oral contamination routes of disease. They then analyse their own hygiene behaviours in light of this information and develop a community plan to block the contamination routes. Its underlying basis is that "no lasting change in people's behaviour will occur without understanding and believing" (Simpson-Hebert, Sawyer and Clarke 1997). PHAST evolved out of a collaborative effort between different stakeholders in the sector including WHO and UNDP which generated a series of innovative field tests in Africa in the 1990s. It is now used widely across the globe in the water and sanitation sector. PHAST Step by Step Guide is available at www.who.int.

¹ Melanesian Vanuatu is an archipelago nation of over 80 islands in the western Pacific and is ranked the third poorest country in the region (Watkins, 2006).

Using the PHAST methodology as a starting point, World Vision Vanuatu designed a water and sanitation project for funding under AusAID's ANCP² funding stream in 2004 in response to needs identified by communities in the Sanma Province. The project was called 'Wota Laef Blong Yumi' (Water is our Life). While it did achieve some successes, the project demonstrates the challenges of overcoming a technology-driven approach to sanitation provision. This case study explores the commitment and support needed in translating principles into practice if water, sanitation and hygiene interventions are to sustain behaviour change and community ownership in rural Vanuatu.

The Project

World Vision Vanuatu's Wota Laef Blong Yumi Project set out to work with an estimated 2,500 residents of 20 villages in the rural district of Fanafo on the island of Santo, to bring about sustainable improvements in the availability and utilisation of potable water and sanitation facilities. It was the first significant water and sanitation project for World Vision Vanuatu. During the consultation process, insufficient quantity and poor quality of water and inadequate sanitation facilities (compounding poor hygiene practices) were linked to a high prevalence of water borne and water and sanitation related diseases for the villagers. The government's Rural Water Supply and

Rural Health teams were unable to address these needs and resources were limited to providing training support. Any improvements needed to be self-sustaining with the community's full engagement as partners in the process.

The populations involved in the Wota Laef Blong Yumi project were rural villagers. Cultural practices, taboos and the gendered division of labour and decision making were key considerations in the project's design and consultation process, and specific gender strategies were incorporated to ensure both women's practical and strategic needs were considered. Within this Vanuatu village context women are the primary care-givers,

cleaners, cooks and food producers and play central roles in health and hygiene within their community and yet men—and overall the chief – hold the decision making roles. Strictly segregated areas for toileting are common throughout Melanesia and these are adhered to by most adults. Issues surrounding taboos, particularly as they apply to women during pregnancy and menstruation, also needed to be considered to ensure that the needs of women were not compromised by the project's efforts to change existing practices.

The Impact

The project was implemented over a three year period ending in June 2007. In its final stage, a participatory evaluation was conducted that utilised PHAST's participatory tools and quantitative and qualitative research methods involving the communities, partners, project team and program management staff. The findings indicate that the project achieved its objectives to a limited degree but was constrained by inadequate resources. The project increased availability and utilisation of potable water with the construction of direct gravity feed systems to seven of the 20 villages in Fanafo. Through the construction of Ventilated Improved Pit (VIP) latrines using locally available materials, access to sanitation increased by 25% in seven villages. However, it is uncertain whether villages will continue to replicate these VIP toilets to further increase the coverage or whether they will be motivated or able to relocate the VIPs once they are full.



Estimating water and sanitation coverage

WORLD VISION



Community mapping using PHAST

WORLD VISION



A functioning VIP latrine

WORLD VISION

² ANCP is the AusAID and NGO Cooperation Program. Under this funding stream, AusAID provides 75% of the project budget and the NGO provides 25% of funding.

Adoption of associated hygiene practices was less evident in the absence of hand washing facilities or effective hygiene promotion in the villages. A health impact was not quantifiable although attribution can be made based on the observed changes reported by the villagers. A key example is the reported increase in children's usage of the VIP latrines.

A clear strength of the project was the strong working relationships developed with key government partners, the Rural Water Supply and the Environmental Health Units. Partners were facilitated in taking active roles in the design and installation of the water supplies and the building of demonstration VIP toilets, and were able to ensure the project was not operating in isolation. In turn these partners are able and committed to providing ongoing support to the communities after the life of the project, contributing to its sustainability.



Analysing good and bad hygiene behaviours for health

WORLD VISION

Listening to women's voices on changes in their villages

"The project has changed the life of people in the community by encouraging them of using better latrines, especially the little children."

"The children have developed a habit of washing three times a day."

"When there was no water we did not have enough time to spend in the garden or to do other tasks. Now with more time to spend in the garden, we have made bigger and more gardens and we are producing more to sell in the markets. Market is the only source of income for us. There has been a big increase in the vatú received from sale of garden produce."

"How food is prepared has changed. Before water supply, mothers roasted food on the fire but now they are able to boil food, prepare soup. Family diets have improved."

"The mothers are also taking pride in their appearance when going to the market. They wash and put on clean clothes when going to the market."

Project teams need on-going support to feel confident with the PHAST process and build their skills in mobilising communities. Without this training and support, things can quickly move from an empowerment process to a means of gaining acceptance for predetermined interventions or health awareness sessions added on to a water and sanitation project.

Challenges

The evaluation process also identified the limitations of the project. The field practice was a substantial deviation from the designed project's emphasis on a community driven and gender sensitive approach. Some of the implementation issues identified included:

- The designed interventions of water, sanitation and hygiene were separated rather than integrated which significantly limited the project's potential impact and effectiveness;
- The project team placed emphasis on the technical intervention of building the water and sanitation facilities and in doing so reverted to a target-driven approach with the inherent limitations the project was envisioned to overcome. This had implications for sustainability, functioning of community management structures, compliance with the intervention, and the degree of community ownership and also contributed to the low scoring across all gender indicators; and
- Decisions were perceived to have been made by World Vision or the male leaders rather than owned by the community, and at times participation was reduced to contributing local materials or labour to the process.

Understanding the outcomes

PHAST is based on the belief that men and women can and should determine their own priorities for disease prevention; that collectively within a community they possess the depth and breadth of health-related experience and knowledge; that regardless of educational background people can understand the faecal-oral route; that they will collectively arrive at agreement on the hygiene behaviours and sanitation systems most specific to their ecological and cultural environment; and crucially, that when people understand why improved sanitation is to their advantage, they will act (Simpson-Hebert, Sawyer and Clarke 1997). Putting such principles into practice requires a commitment of time, understanding and resources at all levels and stages – from the community, the project team, management and the donor.

In practice the potential outcomes of the project were limited in that:

- PHAST was not utilised as a participatory planning tool but rather narrowly translated as health education sessions delivered in short 1-2 day training events with representatives from several communities. The expectation that participants would return to their villages and develop their own plans, a process that when facilitated can often be a week long exercise, proved unrealistic;
- By not fully involving women in planning, training and decision-making the collective experience and knowledge of the community was not utilised; and
- The choice of technologies, VIP toilets and direct gravity feeds, while successful were predetermined.



Women evaluating their voice, choice and participation in the project

WORLD VISION

In this example, the misinterpretation of PHAST by the project team reflects the challenges in re-orientating programs to measure success in terms of process rather than targets as well as the different skill sets that this demands. Without the proper training, PHAST tools can be used didactically, as health education sessions rather than tools that generate discussion. Project teams need on-going support to feel confident with the PHAST process and build their skills in mobilising communities. Without this training and support, things can quickly move from an empowerment process to a means of gaining acceptance for predetermined interventions or health awareness sessions added on to a water and sanitation project.

A gender sensitive approach is one in which women are not viewed as only the beneficiaries of projects, but rather one in which benefits,

control and burdens are equally shared; such an approach is also responsive to different priorities and needs (Wijk-Sijbesma 1998; AusAID 2005). The proposed gender strategies of the project relating to the recruitment of both male and female staff; gender balanced committees; consideration of needs during training; participation and sharing in the management of resources; and gender sensitive training for staff presented challenges in practice. The strategies were not put into action in a way that could overcome the barriers to women's participation and decision-making and perceptions of 'men's business' and 'women's business'.

In the evaluation process men identified that, as women need water for their work in the home and this is a concern for the women, they were involved in decisions and planning. However, the women felt that 'women were

the last to know' and reported that they had little voice. Women were not included in a way that would have enabled the project to leverage the gendered roles of women to the benefit of the project. Without the training and the practical tools the team needed, the project struggled to engage women to participate and contribute beyond their socially constructed roles. The women identified the following ways their participation and decision-making could have increased:

- The recruitment of a female project officer;
- More community meetings open to everyone to share the information about the project directly;
- The meetings not taking place in men's meeting places;
- Separate meetings for women so they could talk more freely; and
- Support for more women in the committees.

The Lessons

The project has improved access to safe drinking water and VIP latrines to roughly a third the number of the communities specified in the project design. For the communities who received the water and the latrines, there are significant benefits. However, the real lessons from this case study are:

- Project designs should realistically reflect the 'achievable' rather than the 'desirable'. Designers in the field need to feel

confident that donors are more concerned about achieving positive impact rather than taking the 'shotgun' approach that sometimes existed in the past;

- Project staff and support staff, such as program officers who monitor project progress, need to be sufficiently skilled in the use of (in this instance) the PHAST methodology and its tools to ensure that the methodology is effectively used within the local context;
- When local people manage implementation, the gender issues upon which project success can ultimately turn may be seen as barriers rather than points of leverage. Gender 'training' and skill development needs to be integrated into the project in the same way that training in the PHAST methodology is necessary;
- Community development approaches to water and sanitation interventions, such as PHAST, draw on specific skills and expertise in facilitation and public health promotion, and these complement and add value to technical engineering skills ; and
- Transformational development is linked to culture, the inherited and shared life guidelines for a community. To 'transform' therefore means to change or alter culture to some degree. This will only happen when it is seen as beneficial to all, but especially by those who are most opposed to change.

Following recent training on PHAST and facilitation skills, the new project team have successfully completed a two week community planning process and are now working to support the two villages in implementing these.

Moving forward

The evaluation process involved the communities, project team, management and stakeholders in what was a team learning and participatory process. A valuable outcome of this is a renewed commitment to the community development approach to water, sanitation and hygiene interventions and the role PHAST can play in facilitating this. The team moved from viewing the project as being about “taps and toilets” to one that was essentially about “people”.

A new project has been designed and commenced to reflect this, one in which outputs are measured in terms of community plans produced and supported, emphasising

the process rather than a target. With the support of World Vision Australia and the Pacific Development Group the necessary resources in terms of training and technical assistance have been committed to ensure the field staff are supported in developing their skills and engaging communities. In addition, a female health promoter has been recruited. Following recent training on PHAST and facilitation skills, the new project team have successfully completed a two week community planning process and are now working to support the two villages in implementing these. The feedback from leaders is encouraging, with one commenting; ‘our expectation was that World Vision would come in and tell us that they are building our water system for

us, but during the planning we learnt that we have to make a contribution as well...thank you for helping us to make our plans’.

This experience from the Pacific supports the argument that, while there are indications that a gender sensitive approach is increasingly being taken in the water sector (e.g. by greater inclusion of women on management committees), the sanitation sector is lagging behind (Wijk-Sijbesma 1998). Since the 1990s, the PHAST methodology has continued to be adapted globally. While it may look different in each context, it is the principles at its core that are the key to its success. PHAST draws on expertise in facilitation and community development primarily, while technical skills are provided only in response to needs identified by a community following its own process of problem identification and analysis. This case study echoes similar experiences with Community Led Total Sanitation, in that for community development processes in the sanitation sector to be a success ‘the key is to train more facilitators in the principles as it is their skills in mobilising communities to change people’s attitudes and behaviour that are essential to the success of the approach’ (Kar and Pasteur 2005).

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Pocket charts are used in PHAST to collection information on sensitive behaviours

4 To their credit:

How three Mekong Delta towns have used revolving funds to increase coverage of septic tanks

Le Thi Hao, Penny Dutton and Geoff Bridger, 3DT WSS Project

The Context

Three towns in the Mekong Delta have shown that a little bit of money goes a long way when it comes to building toilets. The three project towns of Bac Lieu (pop. 135,000), Sa Dec (pop. 95,000) and Ha Tien (pop. 40,000) are situated in the low-lying flood-prone Mekong Delta region of Vietnam. Having no in-home toilet facility is common, with 53% of households in Ha Tien having no toilet at home, 33% in Bac Lieu, and 27% in Sa Dec. Existing excreta disposal methods are unsanitary, particularly during flooding caused by the monsoonal wet season, and include open defecation in rice fields or canals, pit latrines, and in Sa Dec, fish pond toilets. The Government of Vietnam's goal, as stated in the Draft Orientation Plan for Urban Drainage Development to 2020, is to eliminate pit latrines and fish pond toilets in urban areas and replace these, in smaller urban centres, with appropriate on-site waste treatment. The Government's target includes not only the replacement of these methods of excreta disposal but also significantly increasing the coverage of hygienic toilets to all households in urban areas.

The Three Delta Towns Water Supply and Sanitation Project (3DT) is supported by AusAID, Australia's overseas aid program, and is being co-managed by GHD Pty Ltd in association with WASE Consultants. The

overall goal and purpose of the project is 'to improve the welfare of residents of Bac Lieu, Ha Tien and Sa Dec urban wards and communes by rehabilitating and extending water supply, drainage, wastewater and solid waste management facilities and services and to develop the capacity of local institutions and community groups to manage these systems on a sustainable basis'. The project commenced in 2001 and will be completed in 2008.

The Sanitation Credit Scheme (SCS) is one of the four programs within the Community Development component of the 3DT Project. The general objective of the SCS program is to establish a sustainable revolving sanitation credit fund at the Town Women's Union (TWU) level in each town in order to meet the credit needs of poor households to build septic tanks. The scheme directly contributes towards cleaner neighbourhood environments and healthier living conditions by providing loans to poor households for the construction of septic tanks for the safe treatment of toilet wastes.

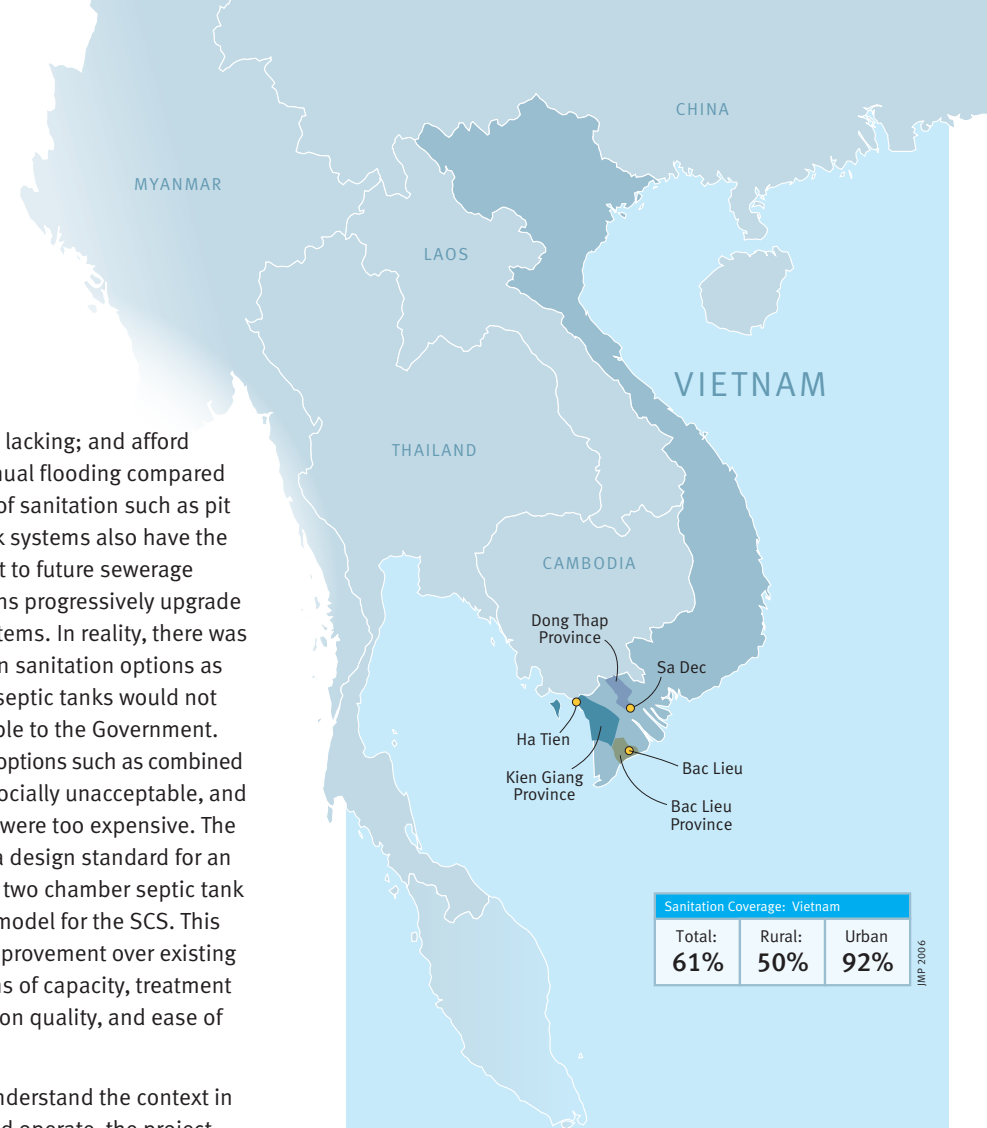
The Process

During the project design phase, septic tanks were confirmed as the most appropriate technology for household sanitation as they are consistent with Government standards; are suitable in dense living conditions where

household space is lacking; and afford protection from annual flooding compared to other standards of sanitation such as pit latrines. Septic tank systems also have the potential to connect to future sewerage systems as the towns progressively upgrade their sanitation systems. In reality, there was little choice in urban sanitation options as anything less than septic tanks would not have been acceptable to the Government. More sophisticated options such as combined septic tanks were socially unacceptable, and sewerage schemes were too expensive. The project developed a design standard for an appropriately sized two chamber septic tank which became the model for the SCS. This standard was an improvement over existing septic tanks in terms of capacity, treatment function, construction quality, and ease of maintenance.

In 2001-2002, to understand the context in which the SCS would operate, the project conducted specific research into the cost of septic tanks, the local construction industry, sanitation behaviours, barriers to having septic tank toilets, repayment affordability and poverty. Although desirable, most poor households did not have a sanitary septic tank toilet because the initial capital outlay was beyond their ability to pay.

During the first year, project staff worked with each TWU to establish the scheme

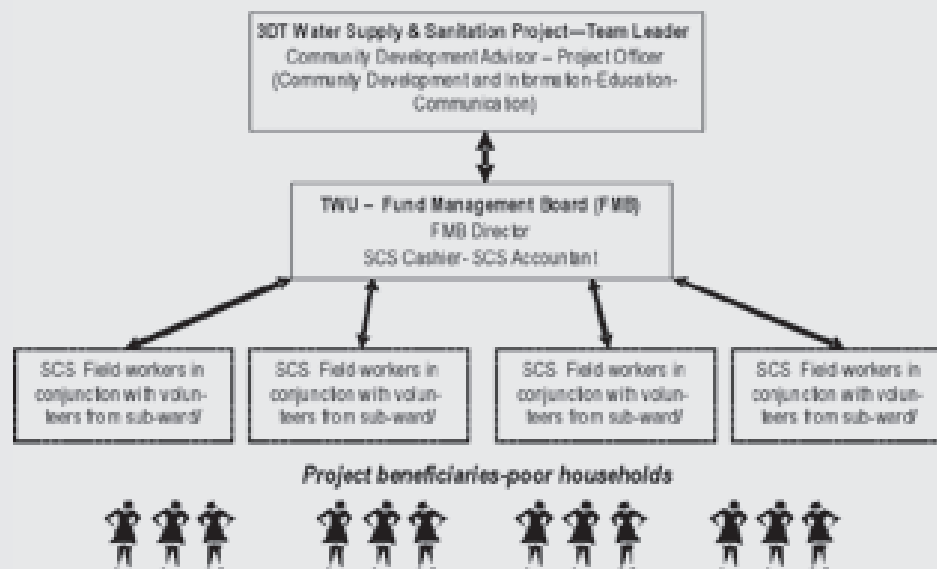


Sanitation Coverage: Vietnam		
Total:	Rural:	Urban:
61%	50%	92%

JMPF 2006

Acknowledgements

The authors would like to thank the Town Women's' Union of Bac Lieu, Sa Dec and Ha Tien for their enthusiasm, hard work and determination towards improving sanitation and health conditions for their own communities. We would also like to thank the numerous families in the Mekong Delta who welcomed complete strangers into their homes to view their toilet facilities. We acknowledge the interest and support of the People's Committees of Bac Lieu, Sa Dec and Ha Tien towns. Our sincere thanks to AusAID, for which, without the vision and financial backing, this project would not have existed.



The Sanitation Credit Scheme Organisational Structure

parameters so they were suitable for borrowers and lenders. Management arrangements and responsibilities of the project, TWUs and other stakeholders were defined, and training was given to TWUs. The schemes were documented, agreed and signed in January 2003 by the project, TWUs, Water Supply and Environment Company, Town People's Committee, Ward and Commune People's Committee, Community representatives and Volunteers.

Initially the project gave each TWU AU\$38,000 as a seed fund for loan capital. Later this was increased to AU\$53,000 in both Ha Tien and Sa Dec. The 3DT project provided additional funds for training and awareness materials relating to septic tanks and improved sanitation. After closely

supporting the management of the schemes for 2 years, in 2005 the TWUs took full management control of the SCSs, and ownership of the seed fund.

Loans to householders were fixed at VND 1,500,000 (about AU\$187 in 2002) with a repayment term of 15 months. The loan amount was sufficient to cover the cost of the essential elements of the septic system: from the toilet pan and slab through to the septic tank treatment system and connection to drains. Loans were not provided for the construction of above ground toilet 'housing' or bathrooms, as this was left to the capacity of borrowers. The first loans were disbursed to borrowers in May 2003 and by August 2007, 4,387 septic tanks have been built under the schemes in the three towns.

The operation of SCS involves the following activities:

- **Establishing a Fund Management Board (FMB):** Each TWU sets up their own entity to manage the loan funds. This involved appointing a FMB director, cashier, accountant, and field workers who represent the TWU at the ward level.
- **Opening a private bank account:** This account is used for transactions relating solely to the Sanitation Credit Fund.
- **Setting up an office area for SCS:** Each TWU sets up an area in its office for keeping records and administering the SCS.
- **Setting up a bookkeeping system:** Excel spreadsheets are used to keep SCS records.
- **Selecting the target client group:** The SCS targets poor households, using criteria set up by the community. The household must accept the conditions of the loan including repayments, and must not have an existing septic tank toilet or be in a future resettlement area.
- **Carrying out Information Education and Communication (IEC) activities:** Promotion of the loan scheme is through regular community meetings with households. These meetings explain the health benefits of sanitary toilets, technical aspects and loan details.
- **Loan approval:** Households complete an application form, which is checked on site by the Field Worker and verified by the local People's Committee. Details of the loan are discussed with the householder and a contract is signed. No collateral is required from borrowers.
- **Loan disbursement ceremony:** Each month, the Fund Management Board conducts one loan disbursement ceremony to hand out loan money directly to households. This ceremony is combined with a training course for the new borrowers to help them actively participate in the credit scheme, and for volunteers from sub-ward/commune to support the management of borrowers.
- **Constructing the septic tank:** A few borrowers build the toilet themselves according to the specifications, but most hire a skilled local contractor. Recommendations for quality contractors come by word of mouth through the Women's Union or neighbours. Householders are free to choose their preferred builder.
- **Loan repayment:** Borrowers make fixed monthly repayments to their Field Workers. An interest rate of one percent per month is charged to borrowers. Fifty percent of interest collected is returned to the Credit Fund to preserve and add to the loan capital, with the other fifty percent disbursed to the Fund Management Board to pay for salaries, administration costs and other overheads. The maximum repayment term is 15 months, with no penalties for early repayment. Each month, new loans are issued to new borrowers using the repayment money received. Over time, the capital fund grows with the addition of interest payments.
- **Monitoring and reporting:** The TWU submits monthly reports to the 3DT Project including bank statements, financial statements, monitoring reports, and lists of new borrowers.

The Impact

Social

The coverage of septic tanks has increased in the three towns with 4,387 households or approximately 22,500 people having new sanitary toilets at home. According to the TWUs, for every two to three loans disbursed by them, there is another septic tank built without financial assistance. This knock-on effect is partly due to more knowledge and awareness about septic tanks, and partly due to direct motivation by the TWU to those who can afford to build a septic tank without borrowing money. Active and enthusiastic borrowers have also become motivators for their relatives, friends or neighbours to build septic tank toilets.

The SCS has had support from project Information Education and Communication (IEC) activities in each town. The awareness activities have focused on key health messages related to hygiene and sanitation and the benefit of using a septic tank toilet. Leaflets helped explain the faecal-oral transmission of disease, the importance of hand washing with soap, and how septic tanks work. The IEC motivators and SCS Field Workers, trained in health communication by the project, have motivated the community by participatory methods. The schemes have gradually helped people improve their awareness and encourage change in behaviour to protect the local environment, reduce pollution and improve their health through using hygienic toilets. It has also raised the

awareness of women to change personal hygiene behaviour to limit skin and gynaecological diseases.

Attitudes have changed regarding toilets and sanitation and this has led to localised environmental improvements. Fish pond and canal toilets in the three towns have gradually been removed. Through septic tanks, human waste and excreta is prevented from directly entering natural waterways and ponds, thereby reducing its effect on the community.

In conjunction with the project's School Sanitation Program, which is building school toilets, the SCS is changing attitudes towards the presence of toilets. School children are now socialised to accept that toilets at home are a normal and expected feature. Toilets

are now accessible for the elderly, sick, disabled and poor. Having a toilet has given poor households status, convenience, and health protection. For women in particular, having an accessible toilet improves safety and dignity and means they do not have to go to fields to defecate during the wet season or at night. Women report that having a septic tank toilet and paying back the loan has given them more respect from their families, particularly their husbands. Borrowers have more involvement in social activities through SCS meetings and TWU activities.



Borrower has improved hygienic awareness as shown by water for cleaning toilet and toilet paper

LT HAO



A Khmer borrower: 'I love my toilet because it is the most beautiful and valuable item in my house'

LT HAO

Financial

Borrowers have improved their own savings habits, in some cases saving from daily earnings in order to meet their repayments. The poor have shown that they can afford to build septic tanks and repay loans and after repaying they are continuing to save money informally for other essential items to improve their living conditions. SCS loans have led to other house improvements, e.g. bathrooms/laundry, kitchen upgrading, and have created a demand for additional loans for house improvements.



Borrower can build his own toilet with technical support from the SCS

LT HAO

The poor have shown that they can afford to build septic tanks and repay loans and after repaying they are continuing to save money informally for other essential items to improve their living conditions.

Technical

Local contractors, the community and small construction companies have become more competent in designing and constructing good quality septic tanks. These contractors and local workers have also benefited by the additional work provided by the schemes. The proficient contractors gain a reputation for their work and are in demand. Desludging is carried out by Water Supply and Environment Companies although in some communities in Sa Dec, where access is only by boat, desludging is being done by private enterprise.

Through another component, the project is training and supporting Water Supply and Environment Companies to develop computerised septic tank management systems and has supplied vacuum trucks to each town for desludging. The Public Works Company in Ha Tien for example, is starting to see desludging as both a necessary urban service and a business opportunity. Currently households have to save for desludging costs every 3-5 years (depending on household size and tank size), although in the future this could be a new type of loan. IEC materials on septic tank operation and maintenance have been distributed to households to improve their technical understanding of maintenance requirements.

Institutional

The capacity of the TWUs has improved. The FMBs have gained much experience in fund and scheme management, with improved skills in planning, financial management, bookkeeping, computer skills, reporting, communication, and greater knowledge about water and sanitation. The FMBs have also increased knowledge in technical aspects of septic tanks construction, operation and maintenance. FMBs now have a stronger focus on good governance, experience with household and neighbourhood community-based approaches and more regard for pro-poor and gender perspectives in sanitation and hygiene. Due to the improved status of TWUs as managers of the SCS, TWUs are more confident to coordinate with local authorities. They have gained respect and status from town and provincial authorities, in some cases being given additional funds to manage for loan schemes.

TWUs have improved their understanding of poverty. They are now less likely to make assumptions about living conditions and attitudes and beliefs of the poor. TWUs have developed pro-poor policies for the very poor including longer repayment terms, and reduced interest charges. Town authorities and water supply companies have contributed by providing free septic tanks to charity recipients such as the disabled, and free water supply connections to very poor households within the water supply service area that borrow from the SCS for a septic tank. These actions have not undermined the septic tank loan schemes as only those with special needs qualify for this assistance. The effect has, however, been to broaden acceptance of good sanitation for everyone.

Due to community demand, a similar program to the SCS has been created for water supply

connections. These are managed by TWUs through Fund Management Boards and are financially supported by the Water Supply and Environment Companies. This means that the poor can further benefit from another loan scheme. The scheme also improves the reputation of the Water Supply and Environment Companies and provides exposure of their infrastructure to the community.

Challenges and Successes

Credit schemes are very popular in Vietnam, with funds from many sources and mostly managed by Women's Unions. However, the 3DT project SCS operates differently from many others. The borrowers have to meet the scheme's strict technical and financial requirements. The SCS is challenged by competing sources of money with less strict adherence to procedures and requirements. However, by using the SCS, borrowers know that they can have the benefit of a septic tank toilet, satisfaction of having discharged the loan, and access to funding for other purposes.

The target clientele for the loans are poor households. This is a challenge in terms of achieving repayments and avoiding defaulting. The SCS successfully kept loan sizes to a minimum by not funding the full toilet so as not to over-burden the poor with unrealistic repayment terms. Borrowers need to be resourceful to complete construction of their toilets, and many have had informal gifts or assistance from families and neighbours, or have reused construction material such as tin, wood, plastic sheeting or whatever is available from home or neighbours. The SCS has been successful in achieving high repayment rates by encouraging daily savings of poor households.

To date no loan defaults have been reported, however there are isolated cases in all towns of some households delaying payment for a few days, usually due to personal crises such as sickness or death in the family. These delays are usually solved locally, for example by the ward WU providing a short term loan; local community/neighbours funding one repayment; extended family contributing money; daily savings; weekly repayments; and in one case, daily repayments to the Field Worker. This demonstrates the range of informal responses which are possible to prevent loan default.

Although a proportion of the interest component of monthly repayments is available to compensate for defaults, draw down of this money has not been required and it instead goes towards growing the capital fund. Careful scrutiny of borrowers and a requirement for outstanding loans to be paid off before taking the septic tank loan has been a safeguard for the credit scheme, as well as reducing the financial burden and vulnerability of households. Feedback on the repayment amount is that it is very suitable for people.

The fund capital is only for loans, with no extra fund for administration activities. Management, administration and promotional costs are funded from interest repayments. Rewards for staff are built into the loans on a commission basis, through interest repayments, so that FMBs have a strong incentive to pay more attention to loan repayments. This has contributed to the financial sustainability and continued involvement of the FMBs. Support and training of FMB staff by the project was funded through AusAID using money separate from the seed fund.

A challenge to the scheme was the initial scepticism of Town People's Committees, Water Supply and Environment Companies and, to some extent, the TWUs themselves. Initially there was little trust that both the borrowers and the TWUs could manage the scheme accountably. To achieve this trust, the TWUs were given ongoing support by the project, including training and advice to help build their confidence and good management practices, particularly during the first 18 months of loan operation.

Each month, loan repayment results and the number of new septic tanks built were reported to Town People's Committees and the Water Supply and Environment Companies to keep them informed. Over time, these organisations could see from the reports that the SCS was achieving its objectives and being successfully managed. Trust was also built through open communication between the TWUs and the Town People's Committee and Water and Environment Companies, through sharing information such as strategy documents,

reports, and evaluation results, as well as inviting these organisations to attend launches, hand over and milestone ceremonies and workshops. This approach has contributed to long term sustainable partnerships between the TWUs and other organisations.

Increased capital funds from the Project and formal hand over of the schemes to the TWUs also showed town authorities that the project believed the TWUs were capable of implementing the schemes.

Giving borrowers the loan funds into their hands directly, and giving them the power to decide who builds their septic tank, showed confidence in their ability. Borrowers responded to this trust and have paid back loans in good faith. The TWUs have established time frames for building the toilet after receipt of the loan, and have strictly followed up to make sure this happens. For borrowers, the loan scheme has been flexible enough to suit individual circumstances but the loan regulations have been fairly and consistently

applied. The success of the scheme is due to a community-based approach, in which even the poor can repay by daily saving. The process is appropriate and accepted by the community and local government.

What's changed for the Bac Lieu TWU

During 2005-2006 the Project undertook surveys and discussions with TWUs to find out the organisational impact of the SCS. The Bac Lieu TWU felt their capacity had improved with the credit scheme. The main change was the growing working relationships the TWU had built with many different people and organisations such as the Ward and Commune People's Committees and the Water Supply and Environment Company. The TWU noted that they are out in the community more and are closer to the Town People's Committee. Previously the TWU was only involved in quite narrow Women's Union activities. Now they are more confident and better at financial management.



Using available wood, tin or plastic to make the toilet house

LT HAO, P. DUTTON, P. DUTTON

Lessons and Recommendations

A revolving credit scheme is a successful way of multiplying sanitation coverage. From grants of AU\$144,000 over the four and a half years of scheme operation so far, the SCS has been able to directly (i.e. using loans) construct 4,387 septic tanks. The SCSs have also influenced the construction of a further 1,500-2,000 septic tanks built indirectly (i.e. without using loans). Had the Government of Australia funding been given directly to households as one-off grants for construction of septic tanks it would have built only 770 septic tanks.

Finding the right organisation to carry out all aspects of a credit scheme, not just the financial loans, is very important. As a mass organisation with networks at the grass roots level, credit experience, and with a charter to promote better family health, the Vietnam Women's Union has unique advantages as the operator and manager of these schemes.

Most women in families and work organisations are members of the WU, so the SCS rightly targets women as borrowers.

An SCS works best with the involvement of a broad range of stakeholders, not just those directly implementing the scheme. The coordination and working relationship between TWUs and Town authorities, Youth Union, Peasant Association, Ward and Commune People's Committee, sub-ward and community group leaders was very important to the success of the SCS.

Sharing of ideas and experiences of the three towns has significant benefit. Bringing TWUs together face-to-face is effective for learning how other towns tackle problems as well as developing support networks.

The amount of support required for a new (and more rigorous) SCS should not be underestimated. In this case the TWU needed to be supported to strengthen staff capacity—they

are not professional people and most are nominated from ward or commune level. Support has included training, development of awareness materials, workshops, equipment procurement, discussions and problem solving, and has undoubtedly given the SCS in each town a solid foundation from which to grow.

Although the project concludes in 2008, the SCS has been operated independently by the TWUs since mid 2005 and without any direct project support or advice since October 2006. The schemes continue to be operated carefully and sustainably by the TWUs, with a growing number of septic tanks being built each year. The sustainability of the schemes is assured by the revolving funding arrangements, built in incentives and thorough training for implementers, and clear scheme regulations and guidelines. In the future, as the coverage of septic tanks increases and the need for a septic tank credit scheme diminishes, the TWUs can apply the principles of the credit scheme to use the funds for other development needs such as water connections, desludging, and house improvements.



Evaluation training workshop for FMBs and Field Workers organised by 3DT Project

LT HAO

5 The Sanitation Park Project:

A regional initiative to increase participatory approaches in the sanitation sector

Rhonda Bower, SOPAC; Dr Leonie Crennan, Institute for Uncertain Futures; and Kamal Khatri, SOPAC

The Context

Government bodies and the public have tended to give little attention to sanitation issues in the Pacific resulting in a lack of investment and therefore inadequate development in the sector. This has had a knock-on effect on the provision of good training facilities for public health workers and appropriate community education. As a consequence, overall awareness and understanding of appropriate excreta disposal, hygienic practices and maintenance and operation of sanitation systems by health workers and communities is limited. The Sanitation Park Project was designed to provide support to communities and health workers in Fiji to identify and address their sanitation problems. The Park, located at the Fiji School of Medicine (FSMed), Tamavua Campus in Suva, provides a range of selected affordable sanitation technologies to be used for demonstration purposes.

The Sanitation Park Project, carried out from 2000 to 2004, aimed to address the lack of awareness and understanding of design, operation and maintenance of sanitation systems and their role in preventing the spread of disease. The Project Team included the

World Health Organisation (WHO), Fiji Ministry of Health (MoH), the Fiji School of Medicine and the Pacific Islands Applied Geoscience Commission (SOPAC) who worked together to implement the project with funding provided by WHO and the New Zealand Agency for International Development (NZAID).

Fiji was specifically the focus of the project because it is the only island country in the Pacific region, apart from Papua New Guinea, with the facilities to train sanitary engineers. In a pre-project survey carried out in 2000, three Fijian communities were selected for the project: Keiyasi in Sigatoka District, Balevuto in Ba District and Nadelei in Tavua District. The survey indicated that Keiyasi, Balevuto and Nadelei had populations of 91, 191 and 315 respectively. In addition to community members, district health workers from the three communities and 10 FSMed students from various faculties of the school were engaged in the project.

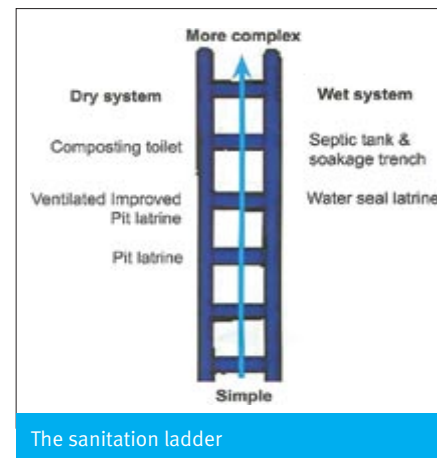
The Process

The project was implemented by the Project Team in two distinct components: 1) the Sanitation Park containing various demonstration models of sanitation systems with

the associated signage; and 2) the Community Program, which included hands-on composting toilet construction training and community workshops under WHO's 'Healthy Islands Initiative'¹ banner.

The Sanitation Park

The Sanitation Park component of the project contains a range of demonstration systems, beginning with low-level technology facilities to progressively higher-level treatment systems, in a 'sanitation ladder' of available treatment and disposal options.



KHATRI et al., 2005



Acknowledgements

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¹ In March 1995, the Conference of the Ministers of Health of Pacific Island Countries, held in Fiji, established "Healthy Islands" as a unifying theme for health promotion and health protection in island countries. This resulted in the adoption of the Yanuca Island Declaration on Health which envisioned Healthy Islands as places where people of all ages are healthy and live in clean environments. Since then, a number of initiatives have been developed in different Pacific Member States to integrate health promotion and health protection actions in attaining this vision. www.wpro.who.int/media_centre/press_releases/pr_20010122.htm

The following demonstration (model) systems are on view in the Sanitation Park:

- Sanitary well;
- Water seal (or pour-flush) latrine;
- Septic tank and soakage trench;
- Ventilated Improved Pit (VIP); and
- Waterless or Composting Toilet (CT).

The park provides an opportunity for interested community members, students, leaders and community health workers to examine how the different sanitation systems work to treat excreta and protect human health. Each system is accompanied by informative signage illustrating the system design and the ‘do’s and don’ts’ of location and usage. This enables

park visitors not only to physically examine each system, which feature cut-away viewing portals, but also to look at the simple signage to understand how the systems work. Viewers can also get a feel for the actual sizes of the systems and the materials used.

Additionally, the demonstration systems serve as a technical training tool used by FSMed in their School of Public Health and Primary Care teaching program. The use of the park has been built into formal environmental health curricula whereby classroom lessons are complemented by a park visit to better understand how each sanitation system functions.

The Community Program

The second component of the project, the Community Program, aimed to provide accessible information to the three selected communities on the comparative value of a range of common sanitation systems, including design, appropriate location, preferred and alternative materials, building costs, maintenance requirements and health benefits and risks. The community participation occurred in three stages:

- **Stage 1: Hands-on Composting Toilet Construction** involving district health workers and community members from Keiyasi, Balevuto and Nadelei. This experiential training involved the construction of a CT system at the Sanitation Park in Suva and was seen as a way to raise awareness and transfer skills. The aim was to enable participants to return to their villages and work places with new skills and knowledge and share these experiences with their respective communities.
- **Stage 2: Community Workshops** under WHO and MoH ‘Healthy Islands Initiative’ in Keiyasi, Balevuto and Nadelei. The workshops, facilitated by the Project Team in the selected communities, built upon the training in Stage 1 and involved key participants reporting back to the community on their experiences in taking part in the hands-on training. The main purpose for the community workshops was to mobilize the village participants to develop Action Plans using the ‘Healthy Islands’ approach and to highlight a range of sanitation and health issues.
- **Stage 3: Ongoing Inspections and Demonstrations** at the Sanitation Park for the public and environmental health students.



Hands-on community training to build drainage trench for composting toilet

SOPAC



Signage on good and bad location of a pit latrine

SOPAC

Each system in the sanitation park is accompanied by informative signage illustrating the system design and the ‘do’s and don’ts’ of location and usage.

A community workshop at Keiyasi: An example of the community engagement approach

What happened?

The two-day workshop in Keiyasi involved representatives from Keiyasi and three other nearby villages, with 43 participants in all. Key activities undertaken during the workshop included:

- Opening prayers and a sermon by the local pastor focusing on the connection between cleanliness and Godliness;
- An introduction to the Healthy Islands program by a Project Team member and government health inspector, in which they discussed threats to environmental and public health such as poor drainage, inadequate disposal of rubbish and the impact of domestic animals within the village;
- A presentation by the Headman of Keiyasi, who had been a participant of the hands-on training in Suva, on his understanding of the demonstration models at Sanitation Park and in particular the construction of the composting toilet (CT). Discussion and questions followed, including a number of queries focused on practical usage, cleaning and maintenance of the CT system as well as questions about how funding and materials could be accessed to build the CT toilet in the village;
- Video footage of CTs in Australia;
- Group prioritisation of environmental and health issues in their villages which required attention;
- A presentation by two medical students on a profile of Keiyasi that they had developed from a survey conducted in previous months. This data included number and type of toilets in a percentage of houses, drainage problems, and certain diseases detected in the surveyed group, such as diabetes, skin disorders, elevated blood pressure and obesity;
- The development of detailed Action Plans which included timeframe and persons responsible to undertake remedial or development initiatives. A representative from each village group then presented their Action Plans to the other workshop participants.

What was the impact?

The Headman's presentation on his experiences at the Sanitation Park sparked much interest in the CT, which the village participants had never heard of before. Keiyasi only had reticulated water for a couple of hours a day, and households had to pay for their water usage, so a toilet which did not use water, and did not need to be moved around (such as is required with a pit latrine) had immediate practical appeal. News about the CT spread through the village after the first day and additional participants attended on the second day. People were interested in building the CT at their homes in the Keiyasi district and on their home islands such as the Yasawas. Saving water seemed to be the main motivation.

In addition to generating interest in the CT, feedback from workshop participants indicated that the workshop had brought new knowledge to the village about how to decrease the number of sick people taken to the hospital by improving hygiene conditions in the village including proper rubbish disposal and animal management. The Action Plans were considered a useful exercise and good step forward for addressing some of these issues on a community-wide scale.

The Impact

Regional Applications

The Project, although implemented in Fiji, has regional application in that the technologies on display are applicable to other countries within the Pacific. The location of the Sanitation Park at a regional training institute, the Fiji School of Medicine, ensures that the Sanitation Park is used as a training site which is available to regional students undergoing health services training. To date, over 250 people have visited the Sanitation Park, including residents from nearby villages, health workers and students from FSMed and the University of the South Pacific.

Physical and Environmental Concerns

The Sanitation Park includes systems which meet design and construction standards in terms of dimensions, fixtures and materials. The demonstration systems illustrate 'best practice' approaches which minimise or limit the impact of wastewater effluent on the environment and community health if properly designed and built. The Park also showcases a zero-discharge CT system, an innovative approach to sanitation in the Pacific region.

The dry composting toilet is still new to the Pacific and is only beginning to be trialled. Innovations like the CT system and other ecological sanitation approaches present new solutions which are increasingly necessary as pollution created by inadequate sanitation becomes a greater concern. Indeed, increasing populations in the Pacific, together with factors such as small land area and fragile ground water systems, have made both traditional open defecation practices and conventional sanitation approaches not

The location of the Sanitation Park at a regional training institute, the Fiji School of Medicine, ensures that the Sanitation Park is used as a training site which is available to regional students undergoing health services training.

viable here (Depledge 1997). The CT system offers an alternative which has practical appeal, is relatively easy to construct and maintain and has clear environmental benefits. The success of the CT training in Fiji has led to similar ecological sanitation trainings in Vanuatu, Tuvalu and Kiribati and the interest to replicate further use of CTs to outer islands in these countries is gaining momentum (see **Case Study 9** for further discussion).

Gender Considerations

In all aspects of the project, there was involvement from both men and women, who actively participated in activities such as cement mixing and slab-laying during the hands-on training on composting toilet construction. This involvement continued in the village workshops, where both men and women took on the responsibilities of facilitating group work and providing their input into village Action Plans. The community groups were not formed based on gender;



Women and men involved in the village workshops developing community Action Plans on sanitation

SOPAC

instead participants formed mixed gender groups in which they felt most comfortable. This was important as both men and women bring their own perspectives and understandings of sanitation, health and hygiene and, when working together, were able to share these viewpoints.

Health and Hygiene Improvements

Through the Community Program, the project was able to address the knowledge gap with respect to the linkages between sanitation, hygiene and health as well as appropriate sanitation system design and usage. Villagers indicated that they were unaware of the health impacts of certain practices, and welcomed the new information provided at the workshops. The creation of healthy village Action Plans put sanitation in the context of wider community environmental health concerns and built a sense of community responsibility for action and change.

Building Skills, Generating Income

The hands-on training on construction of the CT at the Sanitation Park provided potential for a new means of income generation. Participants of the training now have the capacity to build new toilets in response to the demand created by the project, and thus a supplementary source of income. Participants have been encouraged to help train others in toilet construction in order to increase the pool of potential suppliers.

Challenges and Successes

There were many challenges and successes experienced throughout the implementation of the Sanitation Park Project. The following experiences provide some broad relevant insights:

Successes

- In regards to village workshops, billeting of the Project Team in the village for some time allowed relationships to be developed between project personnel and the community and this appeared to also assist with interest and participation;
- The participation and involvement of community members in the workshops was assisted by the active presence of the Chief for the whole event. Having the village Headman involved in training and capacity building activities helped to ensure that information would be transferred back to the community. Such persons carry authority and are able to pass on this information effectively;
- The workshops were able to ensure the active participation of women by taking care with catering arrangements. In Keiyasi, for example, the food on the first day was

provided by a women's church group, while on the second day another group of women took care of catering. This meant that responsibility and funding was shared around and thus more female participants could focus on workshop activities whilst still earning some income; and

- Water savings seemed to be a great motivator for interest in implementing ecological sanitation systems like the composting toilet for reasons to do with cost and scarcity of water.

Challenges

- A major challenge for the project has been effectively monitoring the implementation of the village Action Plans. The development of the Action Plans was considered a useful exercise and a great start, but ongoing support is needed to ensure that improvements to sanitation are being achieved as a result of what was learned. Workshop participants suggested that district health officials return to monitor progress on carrying out the Action Plans. With limited funding and resources to document this progress, it is not possible to get a clear picture of how effective ongoing implementation has been;
- Sanitation and hygiene are not easy issues to discuss in Pacific Island Countries due to numerous cultural barriers. Therefore, there is a need to illustrate the linkage between sanitation, hygiene and health through simple actions used in the daily context of village life. Changing people's behaviour is a long term process, so it was necessary to take caution that messages were simple and well understood by communities to enable them to take appropriate action;

- During workshops, participants were more likely to ask detailed questions, especially about sanitation systems like the CT, when the opportunity for informal contact occurred, for example during meal times or during the small group work. In the evaluation of the workshops, it was noted that more informal sessions such as these should be considered to improve interaction between people, particularly given the nature of the subject matter and cultural taboos around discussing such issues openly; and
- In their evaluations, community participants recommended that workshops could have been improved by hands-on training in CT construction in the village, rather than just in Suva, and that the workshops could have provided more real-life demonstrations to assist the villagers in grasping the concepts presented.
- Having trainees present what they have learnt to their community is an effective method to reinforce and clarify the message, but it is also important that the trainee has the confidence and ability to explain the information in a public setting;
- Overall participation and understanding in a community appears to be increased by the active involvement of women in the practical training, discussion and decision-making. It may be necessary to ensure that women are not prevented from attending the workshop because of their domestic responsibilities;
- Having the right representatives to carry messages and information through to the community is important. It is essential that the community representative at any training outside of the village, such as the hands-on CT training carried at the Sanitation Park, is a senior member of the village to be able to carry some authority over informing and decision making in the village on their return; and
- Avoid if possible, having the village women who are meant to participate in the workshop involved in training arrangements such as catering as this takes priority over their workshop participation.

Lessons and Recommendations

Although there were many lessons learned during the Sanitation Park Project, the following are amongst the most important:

- Practical hands-on training and demonstration is an effective way to promote sanitation systems and convey the principles behind various approaches. People are empowered by learning technical skills and knowing that they can make well-informed choices, and that they can construct and maintain the systems themselves. In the Pacific region there are limited opportunities for such training. Wider use of the demonstration facility and further training will ensure that affordable and acceptable technologies get replicated in other areas;

Conclusion

The Sanitation Park Project is one example of how a demonstration Park and hands-on training can be used as a capacity building tool and an entry point to enhance and improve the knowledge of health workers and community members about sanitation, hygiene and health. There are clearly many benefits of such an approach, and it is hoped that the case study presented here can be used to inform similar work in other localities.



Participants from the Wastewater Training Course examining the sanitary well at the Sanitation Park

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6 A journey from subsidy to Community Led Total Sanitation:

The experience of WaterAid Australia and Plan in Timor Leste

Dinesh Bajracharya, WaterAid Australia

The Context

Timor Leste is one of the youngest and poorest countries in the world. Among the population of less than one million, 60% is illiterate, whilst 40% of children are malnourished. The average family size is 7.8, and the population is growing rapidly. Only 58% of Timorese have access to water supply and about 36% have access to adequate sanitation. The Government of Timor Leste has committed to meet the MDG targets in both water and sanitation. By 2015, if the targets are met, 67% of the population should have adequate sanitation facilities.

The majority of Timor's population live in rural areas, and sanitation coverage in these areas is minimal. Only 13% of the rural population have access to adequate sanitation facilities compared to 68% in district town and urban areas. Within rural areas, sanitation coverage varies, with remote villages having comparatively less sanitation coverage than villages close to district towns. For example in Fahiria, WaterAid Australia's first project village in Aileu district, the sanitation coverage was 27% whereas in Lisaico village in Liquica district virtually every household resorted to open defecation.

The Program

In late 2005, the WaterAid Australia (WAAus) and Plan Timor Leste Partnership Program commenced a Water and Sanitation Program in Aileu District, in the rural highlands of Timor Leste. The objectives of this program were to provide reliable and adequate water supply, household toilets and associated hygiene education in selected program villages whilst building capacity of NGO partner and community management groups (Groupu

Manage Facilidade). During a period of two years, integrated water and sanitation projects were launched in seven villages in Aileu district. The sanitation program took a partial subsidy approach whereby households were provided with different options for latrine models ranging from a simple pit to a pour-flush latrine.

From mid 2007, WaterAid Australia's operations were expanded to the nearby district of Liquica. In the initial project



Local masons constructing a latrine

D. BAIRACHARYA

Liquica District
Aileu District
TIMOR LESTE

INDONESIA

Sanitation Coverage: Timor Leste

Total:	Rural:	Urban:
36%	33%	66%

JMP 2006

Acknowledgements

I would like to thank all the community members of Lisaico, Mauubo, Lisalara, Raime and Baiquinilao of Liquica village for their collective effort and action in rapidly ensuring their villages open defecation free. I would also like to thank Mr. Peter Dwan, International Program Manager at WaterAid Australia for providing access to up to date information on the CLTS approach. Thank you to Mr. Elias Moniz, Chief of Community Water and Sanitation, Timor Leste for his positive view of CLTS. Finally, to Mr. James Wicken, WaterAid Asia Region Advocacy Officer for encouraging me to pilot CLTS in Timor Leste.

selection and scoping, it was found that over 90% of the households in program villages in Liquica practiced open defecation. Access to drinking water supply was severely limited, with water collection taking at least 90 minutes for a round trip. In this severely water-scarce situation the use of subsidies, which had resulted in the construction of pour-flush latrines in Aileu, was considered to be inappropriate. In order to promote rapid behaviour change and create an urgent demand for latrines, WAAus decided to pilot a new approach, Community Led Total Sanitation (CLTS).

This case study explores WAAus experiences in Aileu and Liquica with the use of two very different approaches to sanitation: subsidies and CLTS. Whilst WAAus is only in the pilot stages of CLTS, it is clear that the approach is already making an impact and presents a major opportunity for effectively changing behaviour, engendering community-initiated action to stop open defecation and creating demand for latrines without the use of external subsidies.

Early work in Aileu district

In 2006, the first year of project implementation, WAAus and Plan began a number of water and sanitation projects in villages around the district town of Aileu. These villages all had easy road access to Aileu, and all were located near fertile farm land along the river bank. About 30% of the households in each village already had some form of toilet.

In the first stage of the projects, participatory health and hygiene promotion programs were undertaken. These programs provided information on the faecal-oral transmission

route of disease, and thereby created an interest in building toilets. Information Education and Communication (IEC) materials and tools such as children's drama were designed to deliver key messages related to the prevention of diarrhoeal diseases and control of malaria and dengue fever. These included hand washing at critical times (e.g. after defecation, before eating) and latrine construction.

As demand for sanitation was created through greater awareness of health issues, various latrines models were presented to the communities ranging from basic pit latrines to pour-flush latrines. Households were then able to select their choice of model. The project provided a subsidy for all non-local materials required for the latrine up to the platform level. The contribution from the project per latrine ranged from no subsidy for a simple pit, to US\$32 for a VIP latrine, to a maximum subsidy of US\$78 for a pour-flush latrine. Each household was responsible for digging the pit and contributed labour (both skilled and unskilled) to the construction of the latrine. Households were also responsible for building the latrine superstructure using local material and labour.

To the program team's surprise, despite the costs in cash and in kind, and more importantly despite limited access to water, every one of the households selected a pour-flush latrine as their choice. In discussions, it was found that households aspired to build pour-flush latrines out of sense of pride due to its high status in the eyes of the community. Pour-flush latrines are regarded as the "Indonesian model" which only a very few well-off household could acquire during the years of Indonesian occupation.

The Impact in Aileu

Every household involved in the project built a pour-flush latrine, with a total of 304 households toilets built during the two year period. Some of the pour-flush latrines enabled families to improve and upgrade existing poor sanitation facilities. As there were already some toilets in the villages, these 304 toilets helped all seven communities reach total coverage.

Based on a sample survey of 53 households, self-reported toilet usage and hand washing after defecation amongst men, women and children had increased somewhat from baseline levels. In terms of behaviour change, the project was thus found to have made some impact on households in the targeted communities, although the difficulties and limitations of verifying reported usage were noted.



A children's drama on hygiene education

Moving to a new approach in Liquica

In mid 2007, WAAus began a new program in Liquica district. Compared to Aileu, open defecation was found to be much more widespread and latrine coverage much lower. Initial scoping studies found that more than 90% of households in program villages in Liquica practiced open defecation. Most village households in Liquica had not build or used even the most basic latrine. Promoting a radical change in community acceptance of open defecation was the pressing issue in these villages. It was therefore felt that the hardware subsidy approach, which focuses on individual households and often promotes models that are high in cost and require external input, would not be the most effective. In Aileu, providing a hardware subsidy had resulted in the construction of pour-flush latrines. It was clear that this latrine model would be unsuitable to the isolated and severely water-stressed villages of Liquica. This led the program team to consider adopting the CLTS approach.



An example of a household pit toilet in Liquica

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CLTS was thought to be particularly suitable in the rural poor villages of Liquica for many reasons, including:

- More than 90% of the community members in the Liquica villages resorted to open defecation. There was thus a need for community-wide commitment to the total elimination of this practice. The focus on 'total sanitation' would move away from a household-centred approach and make stopping open defecation a community responsibility.
- Since widespread open defecation was the norm in the project villages, the first step towards improving the sanitation situation was to build simple pit latrines. This would be immediately rewarding and within the villages' reach.
- The pace of latrine construction would not be contingent upon the project's ability to provide external inputs, but would instead be driven by a demand from the community. If the approach was successful, it would create an urgency to construct latrines, potentially bringing more immediate benefits to households and communities.
- CLTS would encourage people to design and construct their own latrine models, thus building confidence in local knowledge and initiative.

Piloting CLTS in Liquica

Once the program team had made the decision to pilot the CLTS approach in Liquica, it was necessary to conduct a series of orientation programs with program partners and staff. WAAus conducted training sessions on the principles and tools of CLTS and the methodology used for the Ignition PRA process (see below). Various documents

including the CLTS guidelines and experiences from other countries such as Nepal were reviewed. The CLTS guidelines were translated into Tetum, the local language, and distributed to partners and staff. In addition to these preparations, officials from the Sub District Administrator's Office and the Department of Water Supply and Sanitation (DNSAS) were consulted to discuss the approach and ensure proper coordination.

Ignition PRA and 'triggering' events

When the team was suitably prepared, a series of Ignition Participatory Rural Appraisal (PRA) sessions were held in all five villages. The Ignition PRA process includes the use of participatory tools to help the community identify and analyse their current sanitation situation, particularly the issue of open defecation. The 'ignition' process uses various PRA tools such as the transect walk, social mapping, problem trees, and defecation site visits to analyse the problem. The ignition in the community takes place when people become aware that they are unknowingly ingesting one other's faeces due to the practice of open defecation. This moment of realisation is utilised to exert peer pressure on people defecating in the open so that they build latrines. Similarly women and young girls are encouraged to put pressure on the male head of the household to build latrines for their comfort and privacy.

During the defecation site visits, the Liquica community groups walked to the places where defecation occurred and considered where these places were in relation to waterways and water points. In this way, the linkage between open defecation and water resource contamination was simply illustrated.

Although most of the faeces had been eaten up by pigs and dogs, the remains of the faeces were visible to the community groups and they became very enthusiastic about doing something to stop open defecation.

Once 'triggered' to act to stop open defecation, householders were found to immediately begin latrine construction. At that stage, there was a strong feeling that the whole village was united to build latrines and work began at once. Young children were observed to be helping their parents to dig their pit, and men and women carried bamboo from a distance. Four widows of one village were helped by their neighbours to build their latrines. The goal for each village was to reach total 'Open Defecation Free' (ODF) status, and this meant ensuring everyone's participation.

Constructing latrines

The CLTS approach encourages people to design their own toilets using some basic design principles, and to make use of available materials. Initially, nearly all of the villagers built simple pit latrines. They dug pits about two meters deep and covered these with wooden joists, leaving a squatting hole in the middle. In most cases, scrap tin or wood was used to make a lid to cover the squatting hole. Most of the squatting platforms were finished with loose earth, which the villagers think need to be improved once a water system is built. The pits were connected to ventilation pipes made of bamboo.

Moving up the 'sanitation ladder'

The pit latrines built after the 'triggering' events were only the first step up the sanitation ladder for the villagers. CLTS has triggered the demand and enabled community members to gain some experience with latrine construction and design. Many are now considering how to improve the quality of their toilets. Some of the improvements that the communities are planning to make include:

- Adding a smooth finish to the squatting area so that it can be easily cleaned;
- Some improvements to the latrine lids to protect flies from entering the squatting hole;
- Ventilation pipes to be covered to protect flies entering or exiting;
- Proper roofs to prevent rain water entering and damage during the rainy season; and
- Proper drainage channels to prevent storm water getting into the pit.

In 42 days from the commencement of the sanitation program in Liquica, total sanitation coverage in all five target villages was achieved.

Seeing is believing: A field visit to Liquica

In late 2007, WAAus organised a sector-wide workshop and training in CLTS for representatives from local and international NGOs and agencies working on water and sanitation in Timor Leste. The group went to Liquica to observe the CLTS process in one of the villages. About 75 villagers including women, men and children were present to meet and discuss their experiences. Many expressed their pride in being able to receive outsiders and foreigners to the village—probably their first opportunity in a life time—and in achieving 'Open Defecation Free' status.

Villagers showed the visitors examples of the toilets they had constructed and answered many questions about the process. They claimed that all households had built and were using their latrines, and that they planned to continue to do so. When asked what they would do if the latrines could no longer be used (i.e. if the pits fill or the toilet is damaged), one representative responded, 'We will build again, because we don't want to be sick.' The field visit went a long way towards convincing representatives that CLTS was having a strong positive impact on village sanitation practice.

Impacts thus far

WAAus are now in the very early stages of the CLTS process, but the initial results are very encouraging. In 42 days from the commencement of the sanitation program in Liquica, total sanitation coverage in all five target villages was achieved. This is a remarkable achievement within such a short timeframe!

The initial success of the CLTS program in the five villages of Liquica has drawn the attention of many organisations working in the water and sanitation sector in Timor Leste including Plan, Oxfam, World Vision and the AusAID funded Rural Water Supply and Sanitation Project. An inter-agency workshop and training program on CLTS was held in late 2007 in Dili to further promote the approach (see box below).



A group of villagers during an Ignition PRA exercise: The first step of the CLTS process

D BAIRACHARYA

Subsidy or CLTS? Comparing the two approaches

In Aileu, communities were motivated to build latrines primarily due to the fact that a subsidy was provided. The toilets built by households are hygienic and clean. There is a space for bathing, providing convenience and privacy for women and children. In general the toilets are technically sound, and total coverage in the seven villages has been achieved. Some changes to hygiene behaviours have also been found. However, there are some drawbacks to the subsidy approach:

- While the subsidy provides a strong motivation for latrine construction, the cost of a latrine is high and therefore it is more difficult to scale up project activities. Self-initiated latrine construction by neighbouring villages is unlikely, as other households will naturally expect and wait for a subsidy;

- With the subsidy approach, the better-off in the community tend to benefit more than the poor because they can usually afford to match a larger subsidy with higher cash and in-kind contributions; and
- The hardware subsidy can make people dependent on external technologies and outside materials. The pour-flush model, for example, is not common in rural areas and requires non-local materials like the toilet pan, plastic pipes, cement, and iron rods. This dependency on external providers can stifle innovation at the local level and suppress local knowledge and skills. This is a crucial issue here in Timor, where people lived for 460 years under Portuguese rule and 25 years of Indonesians occupation.

Although WAAus has only begun piloting CLTS in Liquica, compared with the subsidy approach CLTS has been found to have some clear advantages:

- Through CLTS, demand can be generated spontaneously in adjoining villages, and households can begin constructing toilets immediately. Interested communities can commence sanitation programs following in the neighbouring village's footsteps;



A squatting pan made from local materials

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- With the CLTS approach, nobody gets a subsidy: that's loud and clear. This unites the community as no partiality is created among the villagers in terms of providing different subsidies for different models;
- Since CLTS promotes the use of local knowledge and materials, household toilets vary greatly, reflecting the individuality and resourcefulness of each household; and
- Because CLTS does not prescribe or promote any model, there is a great deal of opportunity for people to innovate and learn from one another. This is the most significant aspect of CLTS in terms of longer term sustainability.

Challenges and Successes

In making the switch from the subsidy to the CLTS approach, two factors seem to have enabled the pilot project's initial success:

- Unlike the project villages in Aileu district, the pilot villages in Liquica are all located in isolated rural communities with little or no presence of government, international NGO or other agency programs. WAAus and Plan had not worked in these villages before. Thus, there was no contradiction with the subsidy approach, and no confusion at the village level created by implementing two different approaches; and
- The people of Timor Leste are believed to be 'wipers'. In the rural areas people commonly use leaves, stones and paper to wipe themselves after defecation. Therefore, it has been relatively easy to achieve the first step in the CLTS process, the building of simple pit latrines, than had the community been 'washers' (i.e. requiring water for anal cleansing).

As CLTS is a new approach in Timor Leste, one of the critical challenges will be to convince those working in the sector that a 'no subsidy' approach can achieve positive results. The reluctance of organisations and individuals accustomed to promoting supply-driven subsidy approaches is a significant barrier that will need to be overcome. Therefore, the successful demonstration of the Liquica pilot project will be vital in increasing awareness and uptake of CLTS amongst the wider water and sanitation sector.

The program team will also continue to tackle the following challenges as they make the shift to CLTS:

- The CLTS approach requires well trained facilitators with a high level of community mobilisation skill, thus there is a need to build capacity in and experience with CLTS facilitation methods. As CLTS is new to Timor, the principles and methods used for community mobilisation will also need to be adapted so that they make sense here. In order to effectively implement CLTS elsewhere in the country, there will need to be significantly more facilitator training, more awareness raising within the sector and more exchange about what works in the Timorese context;
- Many communities have become accustomed to and expect external subsidies. For CLTS to work well, the 'no subsidy' approach needs to be consistent and clear;
- At present, the government lacks the capacity to provide on-going support at the village level, and there are few mechanisms (government, non government or private sector) for longer term support or incentives to communities for achieving and maintaining 'ODF' status; and
- There is currently little private sector interest in producing sanitation hardware components and few businesses in Timor Leste manufacturing such products. Since the sector is predominantly dependent on imported hardware, latrine components can be difficult and costly to source. The lack of a local supply may hinder the ability of rural households to upgrade their latrine model despite a desire to do so.

Conclusion

In making the switch from a hardware subsidy to a 'no subsidy' approach, WAAus is moving from a supply-driven focus to a focus on community empowerment. CLTS is about catalysing communities to initiate action to eliminate open defecation at the village level. Although WAAus is in the very early stages of CLTS in Timor Leste, we are confident that this approach provides the most scope for increasing sanitation coverage to achieve the MDG target. It is hoped that this first pilot program may initiate more interest in CLTS and help trigger a wider adoption of the approach throughout the country.

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7 A Toilet Paper:

Reflections on ATprojects school sanitation in Papua New Guinea

Steve Layton, ATprojects

The Context

While our politicians dream of three storey library buildings and providing individual internet access to our university students, the vast majority of the rural schools in Papua New Guinea are still without the most basic facilities, including simple toilets. And it is not uncommon to find both teachers and students defecating in the long grass surrounding our schools, with this human waste later being consumed by the local pig population.

In 2000, ATprojects Inc. started a demonstration project in the Eastern Highlands Province to build a newly designed sit-down toilet in selected rural schools. The idea was that the school could duplicate these toilets that used locally available materials and all we had to do was show them how to do it.

This project was however, pretty much a failure as while we understood the sanitation needs and the technical parameters of the project we did not at that point fully understand how these rural schools survived.

Rural schools in PNG should receive four grants during the course of the year plus school fees from the parents. The reality is that two of these grants are in fact material grants from the government providing teaching materials to the schools but more often than not these materials never turn up and in some cases end up being sold on the

local black market. The other two grants are financial grants based on the number of students who attend a specific school; however, in practice schools are lucky to receive one of these grants and normally this arrives months late.

The school fee issue is also very interesting. Children in PNG have a right under the constitution to receive an education, something of course we would all applaud. But here again the schools generally end up being the loser as they are not in the position to expel students who do not pay what is now called a project fee (a school fee by another name).

The reality for most schools is that they are lucky if they receive 30% of the budgeted project fee. This means that they find themselves in the position where they can only purchase the basic educational items they need and the necessities such as good toilets are of course forgotten.

Luckily for our project, our enlightened donor partner also saw this reality and we were able to change our project to move away from the idea of demonstration toilets to directly meeting the needs of these rural schools in terms of toilets and now hand washing facilities. We thus began an ambitious project which aimed to improve the health status of about 3,500 students (44% girls) in 10 rural community and primary schools

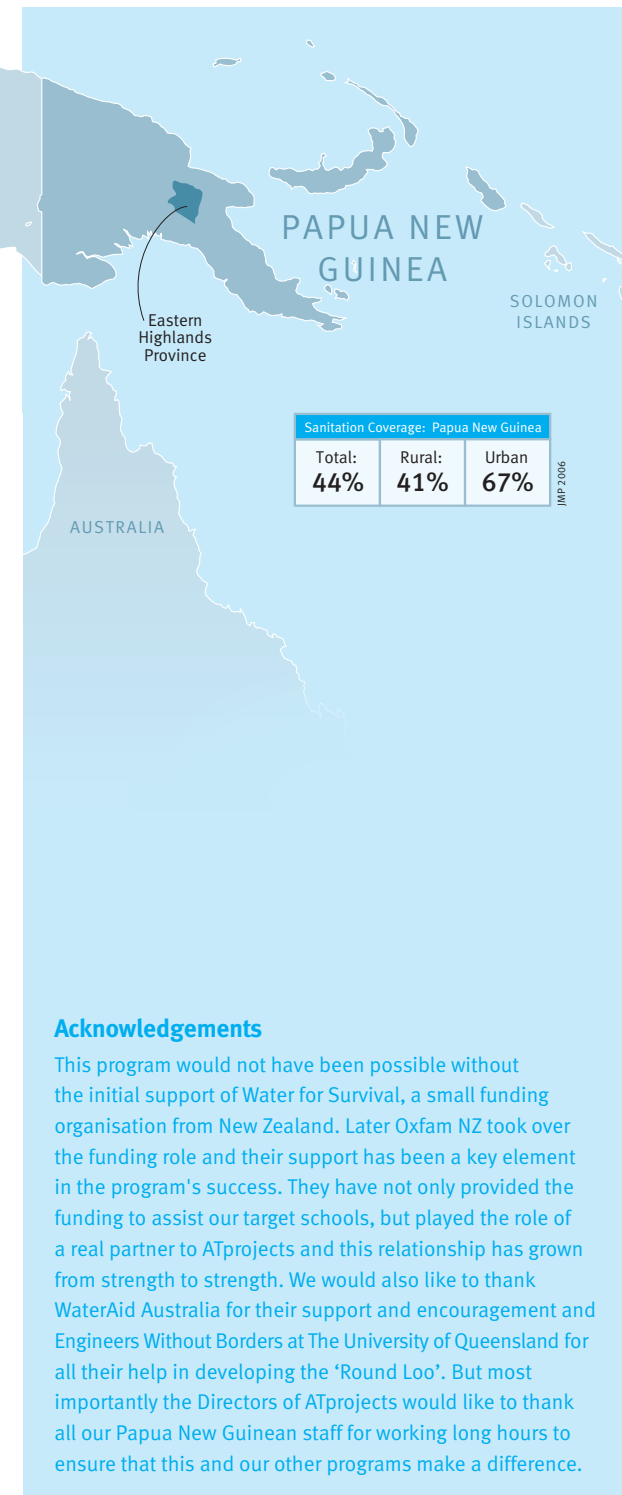
in Daulo District through the provision of safe drinking and hand washing water, sanitation (including hand washing facilities) and health education.

To date we have constructed our innovative designed 'ATloo' Ventilated Improved Pit (VIP) sit-down toilet in over 140 schools. We have supported this construction with a range of software projects including a set of health and hygiene board games called 'Worms & Germs' and workshops for teachers and students. This program continues to be the only such program in this sector operating in the Eastern Highlands Province and remains a focal point for development of school based health and hygiene programs in PNG.



Moulds being prepared at Oliguti Primary School

ATprojects



Acknowledgements

This program would not have been possible without the initial support of Water for Survival, a small funding organisation from New Zealand. Later Oxfam NZ took over the funding role and their support has been a key element in the program's success. They have not only provided the funding to assist our target schools, but played the role of a real partner to ATprojects and this relationship has grown from strength to strength. We would also like to thank WaterAid Australia for their support and encouragement and Engineers Without Borders at The University of Queensland for all their help in developing the 'Round Loo'. But most importantly the Directors of ATprojects would like to thank all our Papua New Guinean staff for working long hours to ensure that this and our other programs make a difference.

The Process

Determining the number of toilets needed

The initial problem we faced was how many toilets to build to meet the needs of each school. We turned to the National Department of Education and asked for some guidelines and were told that a ratio of 1 toilet to every 25 students was the PNG standard. As a gender sensitive organisation, the alarm bells immediately began to ring as the word ‘children’ didn’t seem to account for differences between boys and girls.

We contacted the Department of Education again and eventually it was suggested that this ratio had in fact come from Australia, something we were unable to confirm. We decided that to come up with a more appropriate ratio we would need to test a large number of students and after much debate we decided on 3,000 male students and 3,000 female students. Our aim was to record not only how long each gender took to go to the toilet, but also at what time of the day they went.

Very soon into the research we discovered two things, the first and most obvious is that boys tended to be like racing car drivers bursting in and out of the toilet without changing gear. Girls on the other hand tended to be more laid back about their daily visits to the toilet. The other fact that was initially not so obvious was that there was a particular time of day which we called the PUP (Peak Use Period) when students visited the toilets and this was around the morning recess. What we discovered was that boys on average take 72 seconds to go to the toilet (the record being just under 14 seconds) while the girls on average take a much more leisurely 124 seconds.

Using the findings from this research and the gender balance of rural schools, we were able to calculate that in fact a more appropriate ratio would be 1 toilet for every 60 boys and 1 toilet for every 40 girls. In practical terms, this means that under the old standards a school of 400 students would have had to build 16 toilets at an approximate cost of K20,000. However our findings show that the same school will only need to build 9 toilets (4 for boys and 5 for girls) at a cost of around K11,000, an approximate saving of K9,000.

These findings were presented to the National Department of Education. In the Department’s most recent publication, the NIGPCS, these ratios have been adopted.

With these figures we were able to plan out a project that would accommodate the 216 schools here in the Eastern Highlands Province, and implement this project over perhaps a 12 year period.

Creating suitable workshop materials

As primarily a technology-based organisation, ATprojects needed assistance to develop the teaching materials used in the program. Our donor partner was able to provide short-term consultants to work alongside the rural based

teachers who would use these materials. For example, the development of a set of ‘Worms and Germs’ board games was carried out during a school term break, with teachers volunteering their time and expertise.

All of the teaching materials developed have been done in a way to ensure that they are not only interesting to our target students, but are easily understood and in most cases the language used is Tok Pisin, Papua New Guinea’s most commonly used language. This aspect of our program is one of the keys to our success, as we have found that in most cases ‘importing’ teaching materials from other countries very rarely works.



The ATloo sit-down toilet

ATprojects



Children making roofs for ATloos

ATprojects

The Impact

Behaviour Change

Monitoring in four of our target schools indicates that an average of 91.2% of girls and 80% of boys are using the ATloo during lesson times. In many schools, older toilets with dirty floors have now been replaced with ATloos and students have no problems using them. This is demonstrated by the fact that the bush areas surrounding the schools are now rarely used. The results show that if good toilets are available students will use them. Despite a focus on hand washing in hygiene workshops, our survey indicates that only 33.7% of the girls and 24.2% of boys at the four target schools washed their hands after using the toilet. Moreover, once the soap provided by ATprojects was used up, few schools replaced the soap.

Community Participation

This program is a very good example of how a development program can generate the maximum participation from a community. Each school-based project involves the school board, teaching staff, parent and student bodies. Apart from increasing the capacity of our rural schools to provide suitable toilet and hand washing facilities, the program also provides a way for these schools to maintain these assets in the longer term. There continues to be evidence that the schools we have and are working with are looking after the assets we helped to provide and that this is contributing to a better and healthier school environment. The program is also demonstrating that rural communities can, by working together, improve their schools and this in time will help to provide a better standard of education for their children.

In PNG, society is based around mutual respect and give and take. It is therefore a little strange for people to accept assistance from donors without following the cultural norm of paying something back. Our training workshops use the culturally acceptable threat that if schools do not look after the projects assets ATprojects will come and take them back and they would no longer be a part of our development program. While this approach may not fit into every development organisation's method of operation, it has been very successful and, more importantly, has been accepted by the schools as a fair and just way of working together.



Wider Influence

There is a growing interest in the program from schools yet to be worked in. ATprojects is providing training in the construction of both ferro-cement tanks and ATloos to an NGO working in another province. In addition, a large gold mining company has requested ATloo training for eight landowners who after their training will be contracted by the mine to build ATloos in the communities surrounding the mine site. This request was a direct result of the mine's management seeing ATloos in rural schools near the mine site. ATprojects has also carried out training in these technologies for the large European Commission Rural Water Supply and Sanitation Program.

The program has been visited by all of the Provincial Education Advisors in PNG as part of a training workshop for these senior education officers arranged by senior staff of BEDP (Basic Education Development Program, an AusAid /PNG Government program). During 2006, a Member of the National Parliament invested over K5,000 in an ATprojects ATloo construction training workshop, where four young tradesmen were trained. This training was followed up with a commitment of K50,000 for the construction of ATloos in the Member's home area in the Western Highlands Province. These funds are from the National Government's budget, rather than overseas donor funding.

Next Steps

Moving towards household toilet promotion

While the school based program is going very well, to achieve any real lasting health impact we need to complement this program with an additional toilet design that can be easily

transferred to the home villages of our target students. In most cases these homes only have a bush toilet at best. There are very low replication rates of the ATloo and other models promoted by the local Health Department, perhaps due to the perception that they are too expensive for these rural families.

Once again we found ourselves in a position of really not having the data we required to develop a low cost design for a household toilet slab. The only answer was to take on another research project that would look at how Papua New Guineans used a squat toilet, and 500 individuals of all ages and both genders were tested.

The project used a plywood model toilet that was covered with graphed paper. This allowed us to identify where people placed their feet so that we could design appropriate footpads. We were then able to identify where people missed the hole in our model and thereby redesign the hole to ensure that the largest amount of excrement and urine ended up in the pit. This project also worked very closely with Engineers Without Borders at The University of Queensland to design a slab that used a minimum amount of reinforcing and is thus cheap to produce.

This new slab is now being promoted in areas around our target schools and is creating a lot of interest from not only rural people, but also other development organisations. This new design will allow families interested in having a VIP toilet to get one at an affordable price, by way of a Kina-for-Kina program. The above process has not only been time consuming and required real initiative from our project staff, but has clearly demonstrated the need to move away from projects that fit neatly into any one particular donor's budget cycle.

Improving hand washing behaviour

Clearly the idea of hand washing still needs to be promoted. While schools may see this as important, the idea of purchasing soap and not exercise books is not something that comes easily to teachers. With the lack of school funding for soap, it is necessary to come up with alternatives such as showing students how to use ash to clean their hands. We need to continually promote this issue in the same way as we have promoted better toilets.



While the ATloo has been designed with rural schools in mind, the newer “Round Loo” which is low cost and easy to make is proving to be a hit in local village households. In fact ATprojects is training a number of young rural women to make the round cement slabs and sell them to villagers. This approach to disseminating a technology is interesting in that it provides an incentive for these women to promote toilet construction and use.

ATprojects

Keeping sanitation on the agenda

The issue for ATprojects is how to keep toilets the topic of conversation! And this can only be done by a commitment to an on-going program that views success not as a series of completed projects but as a real long-term partnership with our target schools and communities. All too often in PNG programs come and go depending on a donor’s ability to fund a local NGO’s work. ATprojects is different in this regard as it generates a large percentage of its own income and is committed to the long-term development of sanitation projects in PNG.

Lessons

Over the years we have learned many lessons, but there is no doubt that the biggest lesson is that to really have a positive impact on rural development it is not money that makes a difference. What is most important is taking time to get people involved, developing partnerships with communities and donors and above all having staff that are willing to work in sometimes challenging environments. The main reward is seeing a small improvement in communities’ standard of living.

If we had to list all the lessons we have learned the following six would be top of the list:

- Health education workshops for teachers are an important part of the program as they provide an opportunity to talk about the issues of better toilets and why hand washing is important. We have found that just discussing these issues brings them into the open and schools are slowly starting to think about what can be done to improve the general health of their students.

- It is essential to provide practical instruction on how to use the toilet to students during toilet construction and again during the opening ceremony. While the training materials we use are helpful, the best method of transferring the knowledge to use a sit down toilet is still a one-to-one demonstration. Our experience is that once the majority of the student body understand how to use the toilets, the remaining students very quickly get the idea.
- Securing the support of Headmasters, school teachers and Boards of Management at the schools through Responsibility Workshops is a key component to sustainability. The conditions and cleanliness of toilets have more to do with the Headmasters than how they are used during the day. In schools where Headmasters promote health and hygiene, toilets are often looked after. Similarly, in these schools better rates of hand washing have been observed.
- Continually promoting maintenance and providing on-going teacher training is essential. We have seen that in schools where the teachers were part of the initial school-based project there is a higher level of maintenance and cleanliness. Re-engaging these staff through refresher training is therefore very important. This is particularly true given the high staff turnover rate at schools in the Eastern Highlands.
- School hygiene education sessions provide an entry point for information and education about HIV and AIDS. ATprojects is one of the few NGOs working in rural schools and also providing HIV and AIDS awareness to upper-grade school children.

In terms of feedback on this training, we often get parents and teaching staff commenting that while this type of awareness is culturally difficult to carry out with young children, what we do is very important.

- Bringing about long-term change takes considerable time and commitment, and it can not be rushed. The interest we have seen from government officials, NGOs and private companies is, we feel, a start in the process of ‘mainstreaming’ our work. Of course this process did not happen quickly or by some outside consultant ‘pushing’ the idea. We have been able to slowly introduce the ideas behind our program in a way that is identified as ‘home-grown’ and appropriate for rural development.

Conclusion

If we are really going to have an impact on the overall health and sanitation of our rural communities we need to recognise that it is going to be a long term process. As technology improves and people become slowly more aware of the options available to them they will look for organisations to offer them assistance. The question is if the government, NGOs and donors will be there when they ask for help. We must be ready and willing to work with communities at their pace to create change that is lasting. This is more a matter of time, patience and commitment than of money. Indeed, in PNG there is ample evidence to suggest that the hundreds of millions of kina that have been invested in the past in these types of projects has made very little difference as many people still defecate under a bright Pacific sky.

8 Sustainable Sanitation:

A new paradigm in Aceh, Indonesia

RS Arun Kumar, World Toilet Organization

The Context

On December 26th 2004, the Asian Tsunami and the earthquake which caused it tore down a great deal of the infrastructure along the coast of the province of Nanggroe Aceh Darussalam (Aceh), Indonesia. Strategic infrastructure like water supplies were severely damaged and the homes of almost 200,000 families were damaged or destroyed. More than 50,000 new houses have been built in Aceh and Nias since then, and according to the Badan Rekonstruksi dan Rehabilitasi (BRR),

Reconstruction and Rehabilitation Agency, Government of Indonesia, another 50,000 to 70,000 houses will be built and 80,000 repaired in tsunami-affected areas before the end of 2009.

Pre-tsunami, the sanitation standards in Aceh were poor in general. There was a reasonable understanding of the effects of poor sanitation in the community, although experience suggests there was, and remains, a lack of awareness that realistic and workable sanitation options do exist. This is arguably

the main reason why sanitation has ranked so low in people's minds. Pre-tsunami, the population primarily used defecation areas located outside the habitat area, for example paddy fields or the beach. The use of improved sanitation was rare in most rural communities.

Given the degree of the reconstruction undertaking in the tsunami's aftermath, the focus was on rapid construction. Sanitation was habitually given insignificant thought, with only simple and temporary solutions provided. As early as 2005, the Government of Indonesia advised all housing construction agencies regarding their responsibilities for on-site water and sanitation on their project sites. The post-tsunami reconstruction program includes an upgrade of living conditions involving the establishment of appropriate and sustainable sanitary facilities. The Government provides technical specifications for septic tanks and post treatment in the form of leachfields as the minimum acceptable standard (Badan Standarisasi Nasional 2002). While this is a positive development, there are many challenges related to septic tank discharge in densely populated areas with very high water tables and frequent flooding. Health and technical issues related to failing and poorly maintained septic tank systems in Aceh is a major concern both for the housing agencies and the Indonesian Health Authorities.



State of Aceh, Indonesia after the tsunami

R.S. ARUN KUMAR, E.M. HUBA MANG



Acknowledgements

I would like to thank the people of Aceh who welcomed the "other WTO" with open hands. I enjoyed their unwavering support all the way. I also thank the WatSan Department of Badan Rekonstruksi dan Rehabilitasi (BRR), Reconstruction and Rehabilitation Agency and Assosiasi Toilet Indonesia (ATI) for their field support. Many thanks to Singapore Red Cross Society, for believing in us and supporting the cause with a futuristic vision and financial support.

Installing sustainable sanitation systems, especially in the low-lying coastal communities in tsunami-affected Aceh, presents some unique technological and environmental challenges:

- Groundwater tables in the resettlement communities are very high, typically of the order of 0.4 m to 1 m and higher after recurrent rains, thus creating serious construction as well as treatment challenges;
- The flat coastal topography provides very few opportunities for gravity flows in drainage channels or centralised piping networks;
- Soil conditions vary from site to site and area to area. The tsunami had major impacts on low-lying topography and native soils prove difficult to identify in many locations; and



Ground water level in a typical settlement in Aceh Besar

R. S. ARUN KUMAR; E. M. HUBA MANG

- Soil types range from gravels to sands to clay loams to sticky clays. Soils in low-lying areas remain waterlogged for many days after the rains. Some soils are free draining while others have slow percolation rates.

There are also a number of societal and institutional challenges:

- Demand for sanitation is much less clearly expressed than for other services such as water and power;
- Sanitation systems are seen as just another element of physical infrastructure. Communities do not recognise the benefits of sanitation, at the household level or the societal level;
- Institutional capacity is weak, largely because there is not a clear 'institutional home' for sanitation, which leads to difficulties with policy development and effective implementation; and
- The focus of reconstruction has been uneven, with too much importance on large infrastructure development, and much less emphasis on the needs of households.

The Process

In order to introduce alternatives to better address these challenges, in 2006 the World Toilet Organization (WTO) embarked on a 2-year project, 'Ecologically safe toilets for the Tsunami affected communities in Meulaboh and Banda Aceh, Indonesia', with funding from the Tidal Waves Asia Fund (TWAF) managed by Singapore Red Cross Society. The project aims to provide sustainable sanitation systems for tsunami-affected communities in at least 13 sites in Meulaboh and Banda Aceh. These sites have been

identified together with the Indonesia Toilet Association (ATI) and BRR and include focal points like community centres, mosques, schools, and civic halls as well as orphanages, kindergartens and recreation areas.

By providing community sanitation infrastructure, the project aims to restore the normalcy in the daily lives of families, children and communities while at the same time introducing the concept of ecological sanitation. In the process of setting up permanent sustainable sanitation infrastructure, the project trains local engineers, architects, contractors, and communities, and strengthens their capacity to design, construct and maintain environmentally sound and sustainable sanitation systems. It also addresses the need to spread knowledge and create demand for sanitation through a community-level awareness campaign.

A pilot project in Neusu Park

Neusu Park is one of the 13 locations selected for the set up of a community sustainable sanitation system. The Military Square of Jasdram Iskandar Muda, Neusu Park is a green public utility area with sporting facilities such as a football ground, lawn tennis courts, basketball court and a small park. This park was selected as an important place of recreation for tsunami

traumatised people and is used by a wide range of people: youth for sports, military staff (Jasdram) for marches and exercises, old folks for morning and evening walks. On average, about 150 people visit the park each weekday and this number doubles on weekends. Besides the daily flow of people, the Park also hosts various sporting and other public events.

Another important reason for selecting the park as the pilot project was because of the role the military played in the tsunami aftermath. The long history of regional conflict in Aceh had built up a strong sense of hostility between the general public and the military. However, the disaster management assistance provided by the military has gone a long way towards breaking that hostility. In the gradual easing of tensions since the tsunami, the perception of the military as outsiders is slowly changing amongst local community members. The military too have opened up their facilities (including Neusa Park) to the general public. In a continuation of this gesture, the military officials wanted to be proactive and show their commitment to the people of Banda Aceh, and the public sanitation facilities fitted in well with their efforts to show concern for and build trust with the local people.

By providing community sanitation infrastructure, the project aims to restore the normalcy in the daily lives of families, children and communities while at the same time introducing the concept of ecological sanitation.



Participants and teachers of Sustainable Sanitation Course at Neusa Park, Aceh

R.S. ARUN KUMAR; E.M. HUBA MANG

Deciding on an appropriate system

The WTO Field Team conducted feasibility and pre-assessment studies during which different stakeholders, including Jasdram staff, park users and people from the neighbourhood, were consulted to determine what type of toilet and treatment system would be most suitable. The Park already had a public toilet used by children, women and men with an open well nearby, and another portable toilet, a single urinal in a plastic cabin. These toilets were very smelly with flies and mosquitos breeding around the cubicles and waste being discharged directly into an open channel at the street. It was also discovered that a canteen was in operation in the Park area, providing park users with snacks and drinks. After considering the average flow, peak flow and distribution of people visiting the Park per day, it was determined that the toilet would need two

urinals and one accessible cubicle in the men's section and three cubicles, with one accessible, in the women's section.

Considering the fact that a canteen was operating in the vicinity, it was decided after due consultation with sanitation experts from Germany, India and China to design a treatment system which would include a biogas plant (anaerobic reactor) for pre-treatment followed by a post-treatment stage using a French drain system (anaerobic filter) and a vegetated garden.

The biogas plant uses biomethanation, or anaerobic digestion, to biologically degrade organic material in the absence of oxygen. Oxygen is prevented from entering the system through physical containment and isolation from the atmosphere, and the organic matter is converted to the end products of methane and carbon dioxide

with trace levels of hydrogen sulphide. The French drain filter, a simplified horizontal gravel filter used for on-site sanitation, provides simple filtration and anaerobic treatment. At the end of the French drain filter, a vegetated garden was set up to allow the plants to take up effluent from the filter, thereby removing nitrogen and phosphorus. The final effluent is therefore suitable for irrigation, toilet flushing and other uses.

Training in Ecological Sanitation

As part of the project, a two week Sustainable Sanitation Course was conducted at University Syiah Kuala, Banda Aceh. The participants were selected with assistance from BRR and included a mix of engineers, contractors, architects, builders, students and end-user community representatives. In all, 36 participants took part in the training. The course aimed to raise awareness and provide an overview of ecological sanitation systems focusing on the following key areas:

- The current status of sanitation in the area;
- Ecological sanitation: concepts and experiences;
- 'On the job' training in the selection, designing and construction of ecological toilet and sanitation systems; and
- Operation and maintenance of ecological sanitation systems.



Pre-assessment and data collection at Neusa

R.S. ARUN KUMAR; E.M. HUBA MANG

Community awareness raising

Stakeholder groups including various community representatives, local government officials and the BRR were identified from each of the 13 project locations to carry out sanitation awareness through discussions and informal meetings. Some stakeholders also participated in the Sustainable Sanitation Course to gain technical training in operation and maintenance in order to ensure on-going system operation by the community. The participants of stakeholder meetings and the training course were asked to explore social and cultural practices and their relevance to the selection of appropriate technologies. Through the use of participatory tools as well as videos, posters and other media, the role and importance of sanitation was explored.



A typical toilet at a community centre in Aceh

R.S. ARUN KUMAR; E.M. HUBA MANG

The Impact

The biogas plant and toilet facilities were commissioned in February 2007, after about a year of preparation, training and construction. The responsibility for management and maintenance of the facilities was officially handed over to Jasdam, who acknowledged the importance of the facilities in serving the community. Biogas production started a week after the commissioning of the plant and the gas is presently being used for cooking in the park's canteen. The plant has completed a year of operation, and is functioning well, with enough biogas to cook for over two hours each day.



The Chief of Military and his wife using the biogas

R.S. ARUN KUMAR; E.M. HUBA MANG

Although it has only been operating a short time, feedback on the toilet facilities from park users has been positive. They inform WTO that they can now spend more time at the park without worrying about where to relieve themselves 'when nature calls'. The project location was used as one of the case

studies for participants in a Sanitation Seminar organised by the German Development Cooperation Agency (GTZ) and UNICEF in February 2007, and as a study site for the participants of the Sustainable Sanitation Course. In this way, information about new and more appropriate sanitation options is reaching a wider audience.

Architects and engineers from the Sustainable Sanitation training course were subsequently hired to develop the designs at the other 12 project locations, and participating local contractors and builders were given the construction jobs to gain technical competence in construction techniques and procedures. Thus, a new cadre of skilled labourers is earning income and gaining experience in the construction of sustainable sanitation systems.

The process of stakeholder engagement provided representatives, many for the first time in their lives, with the opportunity to speak frankly about sanitation, thereby breaking a large taboo. Posters and educational materials made the broader community inquisitive and motivated to learn more. Over time, people have begun to appreciate how leaking septic tanks (Cin Cins) are a serious source of contamination since they can clearly relate to what is happening around them.

They also recognise that one ecological sanitation system could not change the environmental health of the entire community, and that each family must take the necessary steps to prevent groundwater contamination. Since the project began, a few houses have set up Fibre Reinforced Plastic (FRP) septic tanks, plastic tanks which are water tight and therefore able to significantly reduce the contamination of groundwater. To a large

extent, these are better than the Cin Cins. WTO has also had discussions with numerous NGOs building houses in the area to highlight the issues related to leaking septic tanks, and many of these organisations are now changing the way they approach sanitation and toilets for newly constructed homes.

Challenges and Successes

WTO took a cautious approach to project implementation since this was the first location where a community toilet was being constructed, as most other agencies in the area focus on household sanitation systems. WTO was aware of the challenges, technical as well as societal, and addressed each of these in turn. The most important of all the challenges was to answer the question: why do we need a public toilet? The approach was two fold. Firstly, it was necessary to provide information on the role and importance of public sanitation, and secondly to present a range of alternative sanitation systems which would be affordable, culturally acceptable, easy to install and use, and require low maintenance. It was hoped that the pilot project would thus be viewed as an entry point for seeding new ideas about sanitation into the community whilst also providing tangible benefits.

Gaining the trust and support of key community members has gone a long way in convincing others of the importance of addressing sanitation problems. Community representatives, including the Village Head and Jasdam officials, played a major role in helping the broader community accept ecological sanitation as a viable option. The military staff in particular were quite impressed with the biogas plant, and wondered initially

how something which was disposed of as waste could have so much potential as energy.

During the training, participants were given extensive guidance on the system's operation and maintenance. The participants gained confidence through 'hands on' practice and were happy to realise that maintenance was not a 'skilled person's' job. Since the military has taken responsibility for the maintenance of the facilities, they have worked out their own more practical methods of monitoring the treatment system, thus indicating a high level of ownership, understanding and comfortability with the system.

With regards to the wider uptake of household sanitation, stakeholder meetings revealed that cost was a major consideration. In meetings and informal discussions, the cost of sustainable sanitation systems was weighed up against the costs of the health and environmental problems created by not having them. Simple calculations from the information provided by stakeholders on the cost of medical care and the number of times they were ill in a given year was used to elaborate on the role good sanitation could potentially play. Videos were shown of locations around the world where sanitation had changed the way people live, which was a great encouragement to the local people. This growing awareness of course does not translate into an immediate change, but will hopefully lead to progressive change over time.

Lessons and way forward

The pilot project at Neusa Park was a good entry point for bringing alternative sanitation options to the public's attention. Having raised some awareness and interest, people are curious to know what other ecological sanitation options exist and which would be most suitable for them. This is important since it is known that all sanitation systems are not applicable for all locations, and various environmental and societal issues will determine the type of toilet and treatment system that is most appropriate.

Of course, a public toilet project can not hope to solve the pressing sanitation problems faced by most Acehnese. The project has provided the opportunity for local people and the training course participants to see and experience several different ecological sanitation options which can prevent pollution of groundwater and land, which are affordable and which do not pose any cultural threat.

As WTO continues project implementation at the 12 other project locations, there is the continuing challenge of raising awareness about sanitation, and ecological sanitation, in Aceh. One of the most important lessons

learned so far is that people accept new ideas only after they have been convinced, and this requires hands-on experience. Once a new approach or system is accepted, people are quick to take it up and even modify the system to suit their needs. Ecological sanitation, with its numerous options, provides people with the opportunity to adapt new technologies to the difficult sanitation situations they face. WTO hopes to continue to build awareness and interest in new sanitation options in Aceh. It is currently exploring the possibility of setting up a permanent training and capacity building centre for sanitation in Aceh, since the sanitation problems faced by Acehnese will require significantly more capacity at the local level.

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The plant has completed a year of operation, and is functioning well, with enough biogas to cook for over two hours each day.

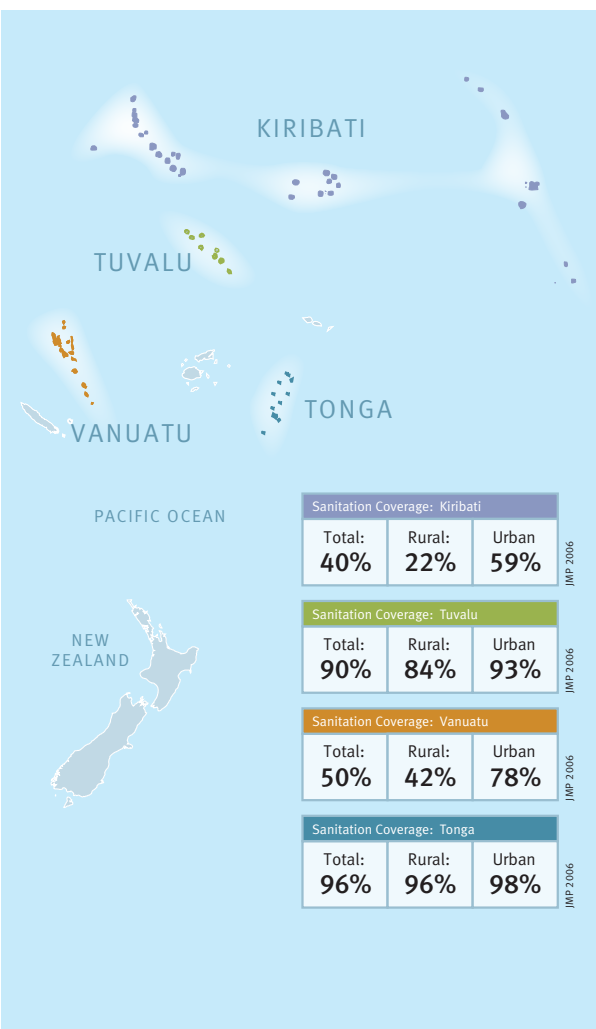


The toilet block and the biogas plant (above) during construction

9 Training in Eco-sanitation

for communities in Pacific Island Countries

Dr Leonie Crennan, Institute for Uncertain Futures ¹



Acknowledgements

Many people have contributed to the five trainings which are briefly referred to in this case study, and there are too many to name in person here. However, acknowledgement and thanks is due to the following: the trainees who participated in the discussions and hard labour with such good humour and enthusiasm, often under demanding physical conditions; the householders who hosted and monitored the sanitation systems; the local officers who organised the complex logistics of the trainings, and the steering committees which supported them; the organisations which provided funding and administrative support; and the cooks and community groups that provided delicious food and refreshments to sustain all those involved.

The Overall Context

In Pacific Island Countries approximately 90% of sanitation systems and 80% of water supply systems are owned and maintained by householders. Of the 10% of the population which have access to reticulated sewerage systems, some of these communities have sewers but no treatment of effluent prior to discharge. The remaining 90% use pit latrines, flush septic tanks, pour-flush latrines, over-water latrines, the bush or the beach. There is evidence of pollution of groundwater, surface water and reefs from these systems and practices. Diarrhoeal disease and skin infections are common, and are the main cause of mortality in children under five (Berry and Crennan 2003).

Most funding for infrastructure and for training in management of water supply and sanitation is directed to government institutions, for administrative and political reasons. However in recent times there has been some effort to offer practical training in sustainable management of water and sanitation to householders and community members, both women and men. The trainings aim to provide communities with sufficient information and practical skills to chose, construct and maintain the most appropriate systems for their long term water supply and sanitation needs. The countries where this has occurred on a small scale are Tonga, Vanuatu, Fiji, Tuvalu and Kiribati.

Local Context, Process and Impact

In each country, the context, conduct and outcomes of the practical training in sustainable sanitation have varied. The construction of a demonstration Sanitation Park, practical skills training, and subsequent workshops in rural villages of Fiji is described in Case Study 5 of this collection. Practical training in Tonga, Vanuatu, Tuvalu and Kiribati will be briefly summarised here.

TONGA: Composting Toilet Trial and Groundwater Pollution Study, Ha'apai, 1997-1999

There are no reticulated sewerage systems in the Kingdom of Tonga, including in the capital of Nuku'alofa. All sanitation systems for government, business and domestic premises are on-site.

On the island of Lifuka in the village of Pangai-Hihifo in the Ha'apai Group of islands in Tonga, a three year trial of waterless composting toilets (CTs) was conducted in 13 homes, a church compound and a primary school. The trial was funded by AusAID, and linked to a ground water pollution study funded by the United Nations Educational,

Scientific and Cultural Organisation (UNESCO), which was conducted within the grounds of the primary school. The ground-water pollution study examined the impacts of septic tanks and pit latrines on the freshwater lens under the village.

Students, teachers, and parents were actively involved in the design, installation and monitoring of the groundwater study and the toilet trial, supported by personnel from the Tonga Water Board, the Ministry of Health and the Ministry of Lands Survey and Natural Resources. The toilets were built by contractors with labour and financial contribution from trial householders (Crennan 1999, Crennan 2001).

Information about the sanitation trial and the groundwater study was disseminated throughout Tonga by radio programs and video. Strict taboos required reference to sanitation to be metaphorical and indirect. Various church and community leaders and householders from other islands and villages visited the trial sites to talk to participants about their positive and negative experiences of the CT, and their understanding of groundwater pollution.

¹ The following presents the views and experiences of the author, who has worked in the capacity of trainer/consultant in the various training activities summarised below. The views expressed here are not those of the participating and/or funding organisations.



Householder uses compost from CT on the family flower garden. The CT has been used and well maintained for almost a decade.

L. CRENNAN

Impact

One of the visitors to Ha'apai was the Town Officer from the island of Ata'ata. As a result of his recommendations, the community on the island of Ata'ata raised funds for materials and constructed a CT at every home, and the church and school. This was to replace pit latrines, save rainwater (which would otherwise be used for flush toilets if they had been constructed) and to protect the reef. This island was dependent on a foreign owned resort for employment, and the eco-sanitation upgrade improved the reputation of the island.

Communities on other islands in Tonga also sought funding to build composting toilets as a result of the Ha'apai trial, and the Ata'ata community's example. Unfortunately they were discouraged, at the time, by personnel from an influential NGO who had a preference for septic tanks and were offering funds for their construction.

A follow-up visit to Ha'apai in 2003 revealed that 4 of the original 13 domestic CTs on Ha'apai were still in use and being well maintained, and two more had been built at church compounds. These householders

used the toilet compost on fruit trees and flower gardens, and reported considerable savings on their water bills. The remaining 8 toilet systems had occasional use and poor maintenance, (one toilet had been abandoned because the home had burnt down). Of the 13 trial households only three of the original participants lived at the same address, due to marriage, migration, retirement and death. In some cases information had not been shared within families, or transferred among development agencies working in the area. A new government school had also been built on the island with flush toilets. This was discouraging for the teachers who promoted CTs and sustainable sanitation at the primary school, and maintenance on these toilets had become neglected (Development Bulletin 2003).

Recommendations from the Department of Environment in Tonga in 2006 detail a need to improve community management of water and sanitation and to promote sustainable practices, including zero discharge waterless toilets and the upgrade of septic systems. The NGO that had previously discouraged adoption of CTs is now assisting with promotion of waterless toilets.

Various church and community leaders and householders from other islands and villages visited the trial sites to talk to participants about their positive and negative experiences of the CT, and their understanding of groundwater pollution.

VANUATU: Eco-Sanitation Workshop, Port Vila, 2004

The organisation and aims of the Port Vila Eco-sanitation workshop involved a combined effort to address sanitation issues in the Tagabe River area in Vanuatu, and to introduce ecologically sustainable sanitation to the wider community through The Vanuatu Island Bungalows Association (VIBA). VIBA represents rural bungalow operators providing eco-tourists with lodging. The Tagabe River Management Committee (TRMC) represents a multi-stakeholder, inter-sector, multi-disciplinary, community-based initiative to restore and protect the watershed. This watershed provides the only source of water to the capital Port Vila.



Trainees building composting chamber, Vanuatu

The VIBA project proposal (VIBA/DoE 2004) listed the following potential benefits, which could flow from the workshop:

1. Solve a major drawback to eco-tourism in VIBA through the elimination of tourist complaints about poor sanitation;
2. Ensure year round toilet availability even through severe drought;
3. Free water resources for more essential uses;
4. Lower installation and maintenance costs when compared with flush toilet systems;
5. Help make bungalow developments viable in areas with small water resources;
6. Eliminate local pollution of groundwater supplies and coral reef systems;
7. Introduction of dry toilet technology;
8. Improved health and hygiene through major reduction of insect borne pathogens;
9. Demonstrate the viability of healthy toilet development in areas where groundwater pollution is a potential problem, e.g. Maskelyne Islands of Vanuatu; and
10. Demonstrate that the composting toilet (CT) requires less land area than wet pit toilets thus increasing the area of arable land available to villages.

The funding for the VIBA involvement in the workshop was provided by the New Zealand High Commission. This funding covered the transportation costs for 25 members of VIBA from all around Vanuatu to attend the five-day workshop in the capital Port Vila in August 9-13, 2004 and a subsequent Annual General Meeting. The funding also aimed to provide some assistance with material and transport costs for VIBA members to install ecological systems at their bungalows if the training inspired them to do so.

A trainer was provided through the European Union (EU) funded Disaster Reduction program conducted by SOPAC, with co-ordination of the training provided by Peace

Corps through the Provincial Council and Department of Environment in Port Vila. The workshop consisted of theory sessions covering design, construction and cost of a range of common on-site sanitation systems, and the construction of a CT in a squatter settlement on the Tagabe River. The crowded settlement only had pit latrines and relied on hand-dug wells into the shallow groundwater. Many of the bungalow owners were chiefs, but all participants were actively involved in design and labour despite constant rain and difficult conditions.

Impact

After the workshop some of the bungalow owners applied to VIBA for assistance with materials to replace their flush toilets with CTs. Due to administrative problems the funds dried up, and this assistance was not provided as intended.

Over the next year, trainings were conducted on three other islands through the Department of Environment, and a block of four CTs was built at the regionally acclaimed Won Smolbag Theatre in Port Vila by contractors who had attended one the trainings. The CT design was adapted to local conditions and materials in order to reduce costs and improve appearance.

A block of four CTs was built at the regionally acclaimed Won Smolbag Theatre in Port Vila by contractors who had attended one the trainings. The CT design was adapted to local conditions and materials in order to reduce costs and improve appearance.

TUVALU: Practical Hands-On Training through the Tuvalu International Waters Programme, 2006

Under the International Waters Programme, conducted through the United Nations Development Programme (UNDP) and the Pacific Regional Environment Programme (SPREP), a pilot project was established to address 'waste' with the aim of reducing the contamination of groundwater and coastal water by human and animal waste.

Community-based activities included low-tech solutions to addressing environmental degradation while national level activities had a more strategic institutional focus. A National Water and Sanitation Committee was established involving heads of government departments and NGOs.

A Communications and Sanitation Training Programme was designed to investigate the current understanding of poor sanitation in Tuvalu, raise awareness of its cost to public and environmental health, (using Baseline Assessment and Cost Benefit Analysis) and promote possible solutions through community surveys and debate, radio, drama, and song and dance competitions.

At the culmination of the communication activities, a practical training on appropriate sanitation systems was conducted on the capital Funafuti and an on-site system was constructed as a demonstration within the pilot community.

The 'hands-on' training in sustainable sanitation was attended by personnel from government and non-government organisations, the private sector, representatives from each community, and the team members of the International Waters Programme. Government personnel from Kiribati were also invited to attend. The training included an examination of the invisible threats (pathogens, nutrients) to public and environmental health from inadequate management of human excreta and compared the design, cost, and maintenance requirements of a range of common sewage treatment technologies.

The construction of a waterless composting toilet was led by the Water and Sanitation Officer from the Public Works Department and all the trainees assisted with the required masonry, plumbing, and carpentry. Breakfast and lunch was provided by rotating community groups which ensured attendance and widely advertised the training. Certificates ratified by an Australian university were awarded to those who completed the course, adding to the prestige of participation in the event (SPREP 2006).

Impact

The trainees expressed satisfaction in acquiring new technical skills and theoretical knowledge and intended to pass the information on to their home island communities. Some trainees volunteered to promote the waterless composting toilets to the wider Tuvalu community and the representatives from Kiribati decided to develop a proposal to have a similar training in Kiribati (see below).

The use and performance of the demonstration toilet has been monitored for the last 15 months. The household has expressed satisfaction, and there have been numerous requests from neighbours and other communities for financial assistance to build the system. Tuvalu is a participant in the regional 'Sustainable Integrated Water Resources and Wastewater Management Project'², a five year project with implementation starting in 2008. Tuvalu is the only participating country which has chosen to focus specifically on improving sanitation. It has planned to install and monitor sustainable sanitation systems in at least 100 volunteer households across the country supported by regulatory and institutional strategies, and practical training and education.



Trainees pouring aggregate into evapotranspiration trench, Vanuatu

L. GRENNAN

The use and performance of the demonstration toilet has been monitored for the last 15 months. The household has expressed satisfaction, and there have been numerous requests from neighbours and other communities for financial assistance to build the system.

² The project is being conducted through SOPAC, UNDP and UNEP and is funded by the Global Environment Facility (GEF) and the EU. Preparations and country consultations have been underway since late 2006.



Trainees at official opening of their CT, Bonriki, Kiribati

L. CRENNAN

KIRIBATI: Tarawa Training, 2007

This low budget training was organised by the Pollution Control Officer from the Ministry of Environment, Lands and Agricultural Development (who had attended the Tuvalu training, see above) in co-operation with the Ministry of Health, and funded by Taiwan Republic of China through SOPAC.

The training included 3 days of theory sessions and 7 field days for construction with participants from government, NGOs, church groups and community groups, and tradesmen. The theory sessions examined and compared wet and dry on-site sanitation and centralised technologies and the field work covered the design, construction and maintenance of a composting toilet at Bonriki Water Reserve. The training aimed to address the pollution, public health and water conservation issues associated with poor sanitation in Kiribati.

The field activities of the training were located in basic circumstances at Bonriki Water Reserve to demonstrate possible solutions to pollution of the public water supply. Illegal settlement on and near the reserve is threatening the groundwater through inappropriate sanitation and waste management practices.

To promote the sanitation training and link sanitation issues with other pollution control issues, the Environment and Conservation Division organised a competition in Bonriki village to separate and manage solid waste. Twenty-five families participated in the competition over several months, and the winner was awarded the composting toilet that was built by the participants in the sanitation training.

The trainees put considerable effort into making the toilet building aesthetically pleasing. This increased material cost but is well worth it in terms of raising the status of sanitation in general, and ecological sanitation in particular.

Impact

The trainees were very keen to build CTs at churches, schools, government housing and homes. The positive response was surprising as there had been previous small and large scale projects in the 1990s promoting CTs in Kiribati which had resulted in rejection of the technology.

CTs had been explored on Kiritimati, in particular because of the high groundwater table and long periods of drought, and 150 systems had been installed as part of a multi-million dollar water supply and sanitation project. The reasons and circumstances resulting in this negative attitude were complex, but nonetheless a resistance to the technology was well entrenched on Kiritimati, and had spread to some quarters on Tarawa.

A number of Government personnel and householders from the training who had participated in the earlier projects, said that for the first time they understood the threats from poor sanitation and the method of treatment and protection that the CT offered. However in January 2008 these trainees were still looking for funding assistance to build their CTs. Meanwhile on Kiritimati, a \$US10 million water and sanitation project funded by the Asian Development Bank plans on replacing the CTs and previously constructed septic tanks with 'improved' septic systems.

In Vanuatu, Tuvalu and Kiribati adaptations were suggested by participants once they understood the treatment principles.



Trainees beginning to build the CT, Bonriki, Kiribati

L. CRENNAN

Challenges and Recommendations

Community training in sustainable sanitation in Pacific Island Countries is a new and evolving field and each event provides different challenges and insights, some specific to that location and some that can be applied to other cultures and countries.

Sanitation is not a fun topic. There is a need for adequate preparation for these trainings to set them in a context that makes the course attractive and prestigious to participants. Presentation of information should address local priorities, beliefs and taboos. This requires research, imagination, flexibility, and a creative relationship between trainers and local co-ordinators. As the practical component of the training is often conducted in remote and demanding physical circumstances, provision of good food, and shelter for breaks, is a conducive pre-requisite.

It is strongly recommended to provide some kind of follow-up after the training, and this should be built into the design of the training at the local level. This is particularly important if the trainees have expressed a desire to improve or change their sanitation conditions. Ideally contact should be made within 6 months of the training to ascertain whether the trainees have taken steps to apply what they have learnt, and if not, then to evaluate what the obstacles might be. The nature and frequency of contact with trainees and monitoring of activities will depend on whether the training was hosted by government, NGOs or the private sector, and other logistical and administrative factors.

It is advisable to have in place mechanisms to assist households with the purchase and procurement of materials for the construction of toilet systems, which can be easily and reliably accessed by trainees and their families, according to their needs. Links can be made to other related programs if sufficient funding and/or support is not available out of the original training/promotion budget. If some ongoing contact and assistance is not provided then much of the success and momentum of the training can be quickly lost.

Technical innovation should be encouraged to facilitate technology transfer. While a version of the waterless composting toilet has been used as a practical educational tool in each of the trainings, it is not a fixed design. In Vanuatu, Tuvalu and Kiribati adaptations were suggested by participants once they understood the treatment principles. The same creative approach should be applied to waterborne technology such as septic systems.

In the broader context of planning for the trainings, conflicting and contradictory messages and programs should be avoided, and if they exist then open debate and discussion should be encouraged and the promoters/funding bodies invited to present their different opinions and approaches during the training. This would further help to foster an atmosphere in which participants and end-users are enabled to make informed choices about the technologies most suitable for them.

The five trainings and follow-up activities briefly discussed in this case study have been presented to demonstrate the breadth of activity underway to promote and encourage more sustainable on-site sanitation in the

Pacific through practical trainings. There remains the challenge of understanding the complexity of each specific context in greater depth in order to learn what elements of such an approach can be replicated, and how. In this respect, these and future activities would certainly warrant a more thorough comparative analysis so that experience gained is built upon and not lost.

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Trainees pouring slab for toilet room floor in Bonriki, Kiribati

L. CRENNAN

About the organisations and authors

CASE STUDY 1

Shifting the focus for sanitation in the Second Water and Sanitation for Low Income Communities Project

The second Water and Sanitation Program for Low Income Communities (WSLIC 2) Project (2001-2008) is a community driven project covering 2500 villages in 37 districts in Indonesia funded by the World Bank, AusAID, the Government of Indonesia and local communities and managed by the Indonesian Department of Health.

Nina Shatifan is the Capacity Building/Participatory Development Adviser with the Water and Sanitation Program for Low Income Communities 2 (WSLIC 2) in Indonesia. She is coordinating the Indonesian component of a 3-country CLTS study by the Institute of Development Studies (UK). Her 10 years development experience in East Asia and the Pacific includes WSS, health, education and local governance programs, working with World Bank, AusAID, Water and Sanitation Program, UNDP, UNESCO and ILO.

CASE STUDY 2

The sum is greater than the parts: An investigation of Plan in Vietnam's double-vault composting latrine program in northern Vietnam

Plan is an international humanitarian, child-centered development organisation without religious, political or governmental affiliation. Child sponsorship is the basic foundation of the organisation.

This case study was conceived by John Collett, Water and Environmental Sanitation Advisor for Plan in Vietnam. John recognised that Plan's Nam Ha "Program Unit" (NHPU) had constructed over 8,000 DVC latrines and this offered an excellent opportunity to investigate the use, maintenance and perceptions in two provinces located in northern Vietnam. The study was conducted by Ben Cole and Dr. Pham Duc Phuc. Ben is an environmental health consultant based in Hanoi. Phuc is currently completing a PhD in urban wastewater at Basel University, Switzerland.

CASE STUDY 3

Putting community development principles into practice: A case study of a rural water, sanitation and hygiene project in Vanuatu

World Vision Vanuatu (WVV) is a part of World Vision International's Pacific Development Group (PDG). World Vision Australia (WVA) provides financial and technical assistance to WVV and is Australia's largest aid and humanitarian organisation. Both are part of the World Vision International Partnership aiming to engage people to eliminate poverty and its causes.

John Donnelly is the WVA Country Program Coordinator (CPC) for Vanuatu, Solomon Islands and the Philippines. John has spent many years working in Melanesia, the last six with WV and has a background in Agriculture. John has recently completed his PhD in the area of gender and development within Melanesia.

Gabrielle Halcrow (MPH, Bach App.Sci) is the Regional Program Coordinator for WVA's Indigenous Australia Program. With her background in Environmental Health Promotion she has utilised PHAST in her experience working with island communities in South Asia and the Pacific on public health, water and sanitation and community development programs.

CASE STUDY 4

To their credit: How three Mekong Delta towns have used revolving funds to increase coverage of septic tanks

The AusAID Three Delta Towns Water Supply and Sanitation Project, is a 7-year AU\$69.5 million project to improve water supply and sanitation systems in Bac Lieu, Ha Tien and Sa Dec towns in the Mekong Delta. The Project is also strengthening the capabilities of the provincial and town agencies to plan, implement and operate these services.

The case study authors are long term Project staff employed by the Australian Managing Contractor GHD Pty Ltd: Le Thi Hao is the Community Development Project Officer, Penny Dutton is the Community Development and Gender Adviser, and Geoff Bridger is Australian Team Leader.

CASE STUDY 5

The Sanitation Park Project: A regional initiative to increase participatory approaches in the Sanitation Sector

The Fiji Ministry of Health (MoH) is the national agency responsible for design, implementation and monitoring of rural water supply and sanitation projects and programmes in Fiji. The World Health Organisation (WHO) is the UN agency responsible for environmental and human health, and poverty alleviation through improved water supplies, sanitation and hygiene. The Fiji School of Medicine (FSMed) is the regional organisation responsible for the training of Environmental Health Officers for the health ministries of Pacific islands governments. SOPAC the Pacific Islands Applied Geoscience Commission is an inter-governmental, regional organisation dedicated to providing products and services in the three technical program areas of Community Lifelines; Community Risk; and Ocean and Islands.

Rhonda Bower holds a Bachelor of Science in Biology and Chemistry from the University of the South Pacific (USP) and postgraduate qualifications in Diplomacy and Environmental Management and Development at the Australian National University. Rhonda worked for SOPAC from 1998-2004 as the Water Sanitation and Hygiene Officer and is currently SOPAC Project Adviser for Integrated Water Resource Management (IWRM).

Kamal Khatri holds a Bachelor of Science in Environmental Science and a postgraduate diploma in Environmental Studies from USP. He is currently pursuing a Masters degree in Geography. He has worked with the Regional Animal Health Services, Agriculture Programme at the Secretariat of the Pacific Community (SPC) as a Research Assistant. At SOPAC, he is responsible for overall coordination and implementation of projects within the WASH program under the Community Lifelines Program.

See Case Study 9 (page 60) for information about Dr. Leonie Crennan.

CASE STUDY 6

A journey from subsidy to Community Led Total Sanitation: The experience of WaterAid Australia and Plan in Timor Leste

WaterAid Australia is an international charity dedicated to helping some of the world's poorest people escape the stranglehold of poverty and disease caused by living without safe water and sanitation. WaterAid Australia began working in Timor Leste in 2005. The primary focus is supporting community water supply, sanitation and hygiene education through local NGOs. WaterAid Australia works in cooperation with Plan Timor Leste in Aileu and Lautem Districts and is also working in Liquica District directly with local partners.

Dinesh Bajracharya is a Country Representative of WAAus and has been working in Timor Leste with WAAus since 2006. He has a Master degree in Environment and Water Resources Management from UNESCO-IHE, Delft, The Netherlands. He has worked extensively in low cost water supply and sanitation technologies in Nepal and Bangladesh for over 15 years.

CASE STUDY 7

A Toilet Paper: Reflections on ATprojects school sanitation in PNG

ATprojects is a non-governmental association based in Goroka, Eastern Highlands Province, Papua New Guinea.

The aim of ATprojects is to enable rural people to use appropriate technologies which give them more control over their lives and which contribute to the sustainable development of their communities. ATprojects provides a number of project development services and is one of the few organisations in PNG offering practical technical support at a district level. ATprojects sees its role as a supporting organisation working with projects generated at district level by local level governments, church groups and rural communities.

Steve Layton is founder and Co-Director of ATprojects.

CASE STUDY 8

Sustainable Sanitation: A new paradigm in Aceh, Indonesia

World Toilet Organization is a non-profit organisation established in Singapore in 2001. WTO communicates the need for better toilet standards in both the developed and developing economies of the world, provides a service platform for all toilet associations, related organisations and committed individuals to facilitate an exchange of ideas, health and cultural issues; and is involved in development and humanitarian sanitation projects in developing countries. WTO's work in Indonesia is supported by the Singapore Red Cross Society Tidal Waves Asia Fund (TWAF), a designated fund providing humanitarian relief and rehabilitation to the victims of the 2004 tsunami disaster.

RS Arun Kumar is the Executive Director in World Toilet Organization. Before joining WTO in 2006, he worked as Team Leader, Enviro Group in Technology Informatics Design Endeavour (TIDE), an NGO based in Bangalore, India for 4 years and was involved in renewable energy and water management projects for rural development. An Environmental Engineer from India, he obtained his Masters in Environmental Management from National University of Singapore, and is presently pursuing his Masters in Environmental Economics.

CASE STUDY 9

Training in Eco-sanitation for communities in Pacific Island Countries

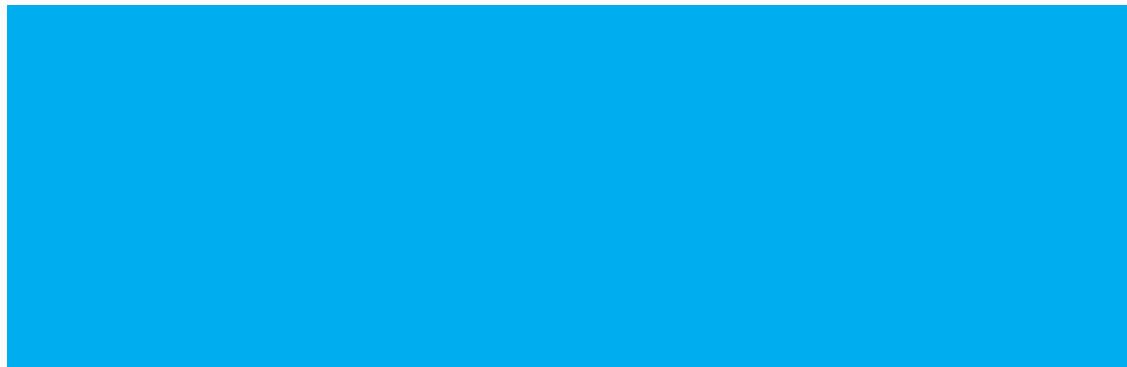
This case study provided an overview of a range of sanitation training activities across the Pacific. In Tonga, participating organisations included the Tonga Water Board, the Ministry of Health and the Ministry of Lands Survey and Natural Resources, with funding support by AusAID and linkages to a UNESCO-funded ground water pollution study. In Vanuatu, the Vanuatu Island Bungalows Association (VIBA) and the Tagabe River Management Committee (TRMC) organised the trainings, with funding assistance from the New Zealand High Commission, and the EU-funded Disaster Reduction program conducted by SOPAC. In Tuvalu, the trainings took place within the International Waters Programme conducted through the United Nations Development Programme (UNDP) and the Pacific Regional Environment Programme (SPREP). In Kiribati, the training was organised by the Pollution Control Officer from the Ministry of Environment, Lands and Agricultural Development in co-operation with the Ministry of Health, with funding support from Taiwan Republic of China through SOPAC.

Dr Leonie Crennan is an Australian resource strategist with a background in Law and Environmental Science. She has expertise in community participation and training, land tenure, media and awareness, gender equity facilitation, policy development, and process monitoring and evaluation. She also designs and implements ecological water and sanitation systems in areas of high conservation and limited resources. Dr Crennan has worked in the Asia-Pacific and Central American regions with a range of organisations including AusAid, SOPAC, SPREP, Sida, UNESCO and the Asian Development Bank.

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This book is a collection of case studies on sanitation and hygiene initiatives in South East Asia and the Pacific. It aims to contribute to a growing community of practice.



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