

## Practical Paper

# Developing behaviour change communication for improving faecal sludge management in Bhutan

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### ABSTRACT

Approaches to improve faecal sludge management practices and on-site sanitation services can better be supported through an understanding of the behavioural determinants and consumer preferences for the services. This practice paper describes a process in Bhutan in which stakeholders collaborated to carry out formative research to identify motivations and barriers to improved septic tank management by building owners in Thimphu City. Using a sanitation behaviour change framework, the findings focused on prioritised behavioural determinants of knowledge of septic tank management and services, willingness to pay and the use of enforcements. The research findings were then used to develop a practical yet evidence-based behaviour change communication strategy for the City in 2012 that aimed to improve safe and timely emptying practices, improve services and increase demand from households, business and institutions.

**Key words** | behaviour change, faecal sludge, urban sanitation

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### INTRODUCTION

In Bhutan, urban growth is accelerating at an average of 7% per year. By 2020 over half of the population will reside in urban areas (World Bank 2008). The rapid urbanisation is increasing pressure on the environment and the provision of on-site sanitation services, highlighting the need for improved management of faecal sludge. Approximately 70% of the estimated 120,000 residents of Bhutan's capital city of Thimphu rely on on-site sanitation (Dorjee 2011). Beyond the capital, regional towns also continue to promote on-site sanitation but without a corresponding focus on sludge management services. The growing environmental health issues are difficult to ignore with leaking septic tanks and infrequent and unsafe emptying practices.

The Ministry of Works and Human Settlements (MoWHS) as the lead line agency is working in partnership with SNV (Netherlands Development Agency) and Thimphu City Corporation (the 'City') to develop approaches to ultimately improve access to environmentally safe sanitation and hygiene practices in urban settlements. A review

undertaken of the legal and institutional arrangements guiding urban sanitation and hygiene nationally identified several gaps and recommended institutional capacity strengthening and resource allocation for sludge management, wastewater management and hygiene promotion (Carrard & Omu 2012). In parallel in 2012, national regulations were introduced under the Waste Prevention and Management Act 2009 that provided a basis to apply sanctions and enforcements.

Since the partnership began in 2011, formative research has been conducted to improve understanding of consumer needs and preferences for de-sludging services and of behavioural determinants that can motivate and enable householders to access and pay for these services – firstly in three small regional towns in Chukha District (Pedi 2011) and then in Thimphu City (Yetsho & Nguyen 2012). The consumer research study from Chukha District provided initial insights into key barriers to proper sludge management which included access to services and

knowledge. They also indicated a demand for and potential willingness to pay for de-sludging services within towns that are planning to provide future services. The study included findings that were explored in further depth and validated in Thimphu where, in the absence of private sector operators, the City currently provides sludge removal services but with limited uptake and challenges in service quality.

For Thimphu City's estimated 84,000 residents, typically living in rented apartment buildings and relying on septic tanks, there are a range of service options provided. Timely de-sludging is recommended every two years on an on-call basis. Building inspectors regulate the provision and design of the septic tank as part of the occupancy permit process in line with the Building Code but guidance on operation and maintenance is not specifically addressed. For residents connected to the water metre, 50% is allocated to sanitation services and entitles the resident to 'three free trips' per year. This service was recently expanded to 'six free trips'. The actual number of trips required though depends on the size of the septic tanks and the volume of the tankers at 3 cubic metres. Larger buildings and institutions or communal tank owners may need to pay for additional trips at a cost equivalent to US\$19 if the tankers' capacity is not large enough to empty the tanks within the allocated number of trips. Residents without a water metre can access the cess-pool services for this same fee per trip plus additional transportation costs for households located outside of the Thimphu core area. There are only limited records maintained, the total number of septic tanks and the actual frequency of emptying is unknown. It is considered too low based on the number of overflowing or failing tanks visible or reported as complaints. Records indicate on average 54 trips are made by the three tankers per month with sludge disposed of to the treatment plant. Those not accessing the City service resort to manual unregulated emptying, potentially unsafe and illegal disposal or allow tanks to overflow.

This practice paper describes the use of formative research to inform strategies to improve management of on-site sanitation systems in Thimphu undertaken collaboratively by stakeholders in 2012. The objective of the research was to identify motivations and barriers to improved septic tank management by building owners in Thimphu City with a specific focus on the prioritised behavioural determinants of: knowledge of septic tank management and services;

willingness to pay; and the effect of enforcements. The research was facilitated as a capacity-building process with key government agency and practitioners actively engaged in lead roles. It informed the development of a planned behaviour change communications strategy for the City.

## METHODS

The formative research focused on tenants' and building owners' knowledge and understanding of on-site sanitation and related operational and maintenance needs, existing practices related to septic tank maintenance, awareness of existing service options, preferences for service options and reported willingness to pay. Formative research was understood to be research conducted during the development of a programme to assist in planning and designing interventions (Gittelsohn *et al.* 2006).

The study used the SaniFOAM (sanitation Focus – Opportunity – Ability – Motivation) behaviour change framework to identify the key barriers and motivations for the behaviour leading to development of the research hypothesis by stakeholders (Devine 2009). SaniFOAM is a framework for behavioural determinants developed in rural sanitation to understand opportunities, abilities and motivations for the behaviour of interest among the target population. The SaniFOAM framework illustrated in Figure 1 is structured in terms of:

- *Desired behaviour.* The behaviour that needs to be changed, e.g. timely de-sludging of septic tanks.
- *Target population.* The group that in most cases needs to be targeted to adopt the behaviour.
- *Opportunity.* Institutional or structural factors that influence an individual's chance to perform the behaviour.
- *Ability.* An individual's skills and proficiency to perform the behaviour.
- *Motivation.* Drives, wishes, urge or desire that influence an individual to perform behaviour.

Whilst no available literature was found on consumers' views on faecal sludge management, the process built on the preliminary consumer research in Chukha and available baseline data. Based on a household survey of a 10% stratified random sample, the baseline reported that, whilst most



**Figure 1** | The SaniFOAM framework and classification of behavioural determinants. Source: Devine 2009, p 5.

households knew where the septic tank was located, 60% reported that they did not know how often their septic tank needed to be emptied and only 6% of respondents felt it was necessary to empty their septic tank regularly (Penjor et al. 2011).

Hypotheses were developed in a participatory workshop process with key stakeholders and practitioners to target the key behavioural determinants for exploration in the second study. Rather than focus on all of the behavioural determinants in the framework, this step sought to prioritise and refine the scope based on the existing experience and knowledge of the stakeholders and the area perceived of being of most value to explore in the given context for the strategy development. The following hypotheses grouped by behaviour determinants were developed:

- If building owners knew about the de-sludging services available, they would empty their septic tanks (*knowledge*).
- If building owners knew how to check if their tanks are full, they would empty their septic tanks (*knowledge*).
- If building owners felt that the cost of de-sludging was good value for money, they would pay for the additional cost for more than ‘three free trips’ (*willingness to pay*).
- If building owners knew that they could be fined they would empty their septic tanks (*sanctions*).

Research tools included in-depth interviews with Thimphu City Corporation staff and building owners including those who had never called for de-sludging services (non-service users), those who called for services provided as part of

their water bills and those who had used the recently available ‘six free trips’ extended services provided within the last few months (service users). The qualitative study involved in-depth interviews with a simple random selection of building owners and tenants from the City’s record of users who had called for de-sludging services from January 2011 till the beginning of 2012, as summarised below.

- Key informant in-depth interviews: The head of the City sewerage division and cesspool tanker workers were interviewed to better understand the service provider perspective including volume of services, operation and maintenance and scope for improvement, etc.
- In-depth interviews with users and non-users of the services: A total of 43 interviews were conducted, 38 with building owners (15 M, 23 F) and 7 with tenants (3 M, 4 F), to better understand the demand for de-sludging services. Of these, 28% reported as non-users of the service.

Four interviewers led by a lead researcher from SNV and the MoWHS in close coordination with the City during April 2012 undertook the data collection. The research team members received one day’s training on the data collection methods, tools and process and were mentored through the process subsequently. Question guides were developed and tested. Data processing and analysis followed manual transcriptions, collation, summarisation and analysis and was undertaken by the team identifying key themes under the determinant classifications.

## RESULTS

The findings are presented according to the prioritised behavioural determinants of knowledge as it relates to *ability*, sanctions as it relates to *opportunity* and willingness to pay in terms of *motivations* using the SaniFOAM framework.

### Knowledge

As Table 1 illustrates, all building owners were aware of the location of their septic tank and water metre systems and most reported they knew how to look inside the tank. Through experience, they were aware of the existing services including the ‘three free trips’ offered by the City as well as the process of de-sludging.

Knowledge gaps did exist. Although most respondents reported looking inside the inspection chamber this will only indicate the liquid depth. The MoWHS recommends that the tank be emptied when the sludge occupies approximately two-thirds of the total depth of the septic tank, which would require sludge depth to be checked. With the recent addition of the ‘six free trips’ by the City, most service users were not yet aware that they were now entitled to an additional three trips per year.

Table 2 represents knowledge among the non-service user group who had not had their septic tanks de-sludged

**Table 1** | Knowledge of sludge management among service users

Enablers (+)	Inhibitors (-)
+ All building owners were aware of the location of their septic tank and water metre system	– Most building owners did not know how to determine if their septic tanks were ‘full’ and therefore when to call for services
+ Most building owners did report looking inside the inspection chamber to determine if it needed emptying	– Many building owners did not know that they need to check the sludge level to determine if it needed emptying
+ Most building owners knew about existing services and the process of de-sludging	– Most building owners did not know about the new extended services
+ Building owners knew that grey water should not go into the toilet	

**Table 2** | Knowledge of sludge management among non-service users

Enablers (+)	Inhibitors (-)
+ All building owners were aware of the location of their septic tank and water metre system	– Building owners did not know how to determine if their septic tanks are ‘full’
+ Most building owners looked inside the inspection chamber to determine if it needed emptying	– Building owners did not know that they need to check the sludge level to determine if it needed emptying
+ Building owners knew that grey water should not go into the toilet	– Most building owners were not clear on the services provided by the City and the process of de-sludging services

using the service. The main difference was that most non-service users had less understanding of the existing services provided by the City and the process of de-sludging. Fewer building owners reported looking inside the inspection chambers of their septic tank than users did. Like users, non-users did not know how to determine correctly whether their tanks were ‘full’.

### Beliefs and attitudes

More than half of the building owners did not feel they needed to empty their septic tanks until they overflowed. For example ‘I take my own initiative to empty the septic tank when it is full and starts to overflow. I also do not know how to check my septic tank unless it overflows’ (building owner, Thimphu, 26 April 2012). The majority of building owners were satisfied with the process of accessing the services; however, a few institutions felt the process was time-consuming and could be improved. ‘The process of getting the services from Thimphu Thromde (the City) is really time consuming for office people and waste of resources such as filling in the hard copy form’ (institution, Thimphu, 26 April 2012).

### Willingness to pay

The majority of building owners were willing to pay the price charged by the City for de-sludging services. Those who were not connected to the water metre though found

it expensive owing to the cost of de-sludging coupled with additional transportation costs if outside the core town area.

## Sanctions

Most of the respondents felt that imposing fines would increase the demand for de-sludging services and force building owners to become more aware of the services provided by the City. However, some informants felt that if services could be improved, then fines would be unnecessary. 'If there are improvements in services from Thimphu Thromde, then imposing fine is not required or relevant' (office, Thimphu, 26 April 2012).

Consumers reported access to services as adequate but satisfaction with the quality recorded was low, including response time, the process of accessing the services and administrative processes. There is an indication of the presence of physical and social pressures, which are potential motivators. Some building owners were encouraged to call for services after foul odours emitted from their septic tanks and/or upon complaints from their neighbours. Institutions in turn were motivated to call for de-sludging services owing to regulations requiring public places such as schools and offices to be clean and hygienic. 'The school requires regular emptying of septic tanks as it is the school space where there are lots of children and it's very important to maintain hygiene at all times' (teacher, middle secondary school, Thimphu, 27 April 2012).

## DISCUSSION

Users of the services were more knowledgeable about the need to empty their septic tanks than non-service users. With a service model based on on-call services, a key area to address was the belief that services were only needed when tanks failed or overflowed owing to the related environmental health risks and reduced effectiveness of the tank over time. The knowledge gaps related to how to check sludge depths can be addressed through communications but this needs to be monitored. Knowledge alone may not be a sufficient enabler and scheduled servicing may be a more realistic solution in the longer term. Customers reported a willingness to pay for extra services if they were improved although quantifying this would require more in-depth research.

In the Bhutan context the use of formative research in the development of behaviour change communication and improving services was new. Typically communication materials or messages are developed based on perceived knowledge gaps with a strong health message focus. In this capacity-development process, the findings of the formative research in comparison with the hypotheses developed by the stakeholders highlighted the need for the concerned agencies to undertake consumer research. In understanding more about consumer needs and preferences they either validated or debunked existing assumptions before developing communications as part of broader programme development. For example, in terms of the hypotheses that most building owners will not pay for services beyond the free trips included in their water bills or that they feel that the cost of de-sludging their septic tanks is not worth it both proved to be incorrect. The research instead found that, for example, they are willing to pay, but a variety of factors related to knowledge and attitudes may play a larger role in convincing owners to call for services.

The outcomes from the research were used to develop an evidence-based behaviour change communication strategy for Thimphu City and for the urban settlements of Chukha District in 2012 in a participatory workshop process with stakeholders. In addition to improving timely and safe de-sludging, the strategies also target hand-washing practices at critical times and improving sanitation in the informal settlements based on parallel formative research processes. The strategies for timely and safe de-sludging included communication objectives focused on the determinants of knowledge and attitude and used a range of communication channels to reach the target audience. A specific objective was included to raise awareness of the new waste management regulations to ensure that Thimphu City residents are conscious of the fines and fees should they be imposed at a later date.

Informed by the research, stakeholders identified a number of communication activities and channels to reach building owners:

- *City office.* Visual materials to be displayed so that customers coming to enrol or pay for services are exposed to messages.

- *Water bill user meetings.* During the year, meetings are held with households connected to the water metre, which can be used to communicate the objectives.
- *Toll-free hotline.* Existing service for residents seeking advice or to lodge a complaint can also serve as a channel to provide information on timely and proper de-sludging.
- *Building inspectors.* Building inspectors play a crucial role throughout the construction process and could communicate in relation to operation and maintenance.
- *Occupancy permit.* The required meeting to issue the permit offers another opportunity to ensure that building owners know how to manage their septic tanks and when to call for services.
- *Water bills.* Messages and reminders related to septic tank management and how to access services, including the details of the toll-free hotline and the extended services can be printed on all water bills.

The strategies summarised in Table 3 are now being implemented and monitored combined with longer-term improvements to service delivery and institutional arrangements as endorsed by the Mayor in 2012.

## CONCLUSION

The SaniFOAM framework has historically been used in designing rural sanitation programmes but was applied to the urban sanitation service delivery setting in this process. As a tool for understanding the determinants of sanitation behaviours it proved a useful framework when applied in the urban context of faecal sludge management. It ensured a better understanding of issues from the perspective of consumers and end-users that can enable the government and service providers to effectively target resources towards sanitation services that people want, understand and are willing to pay for.

The framing in terms of behavioural determinants allowed the stakeholders to break down the larger question of 'why don't people empty their septic tanks' in a structured process concerning determinants of knowledge, attitudes and willingness to pay. Through defining the

**Table 3** | Strategies to improve communications and service delivery improvements

Level	Actions
Communications	<p>Strategy targeting building owners' knowledge and attitudes to:</p> <ul style="list-style-type: none"> <li>• Know why and how to check the sludge depth of their septic tanks</li> <li>• Know when to call for de-sludging services</li> <li>• Know the range of services offered and their entitlements</li> <li>• Feel that it is important to empty their septic tanks before they overflow</li> <li>• Know about the new regulation on waste management</li> </ul>
Service delivery level improvements	<ul style="list-style-type: none"> <li>• Greater responsiveness to requests for services, particularly emergency requests</li> <li>• Provide customers with advice on septic tank monitoring and management following de-sludging of their septic tanks</li> <li>• Improve the toll-free service hotline</li> <li>• Provide equal attention to customers not connected to a water metre</li> </ul>
Institutional level	<ul style="list-style-type: none"> <li>• Develop interim measures to enable households without access to roads to safely empty tanks</li> <li>• Develop long-term plans to enable more households to connect to sewerage treatment options</li> <li>• Fines can be considered but must be coupled with a strong communications campaign on the benefits of compliance and the disadvantages of non-compliance</li> </ul>

hypothesis in a participatory process using the framework the research was able to focus on a defined target group, the building owners, and the prioritised determinants, which was manageable from a human resources and capacity perspective. Following these types of processes in broader programme designs may also assist in providing practitioners with clarity in terms of integrating and targeting communications.

The process overall contributed to developing a more appropriate and targeted consumer awareness, education and behavioural change communication campaigns and parallel consumer support service improvements. Undertaking formative research as a capacity-building approach

embedded within a broader programme contributed substantially to the ownership of the overall process and the sustainability.

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