Proceedings of the Learning Event on

Urban Sanitation – Professionalization of Emptying Services

Urban Sanitation & Hygiene for Health and Development programme

Manila, Philippines, 30 November -3 December, 2015

SNV

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This report documents the activities from the *Learning Event* held by SNV Netherlands Development Organisation in Manila, Philippines, from 30 November to 3 December 2015, as part of the Knowledge and Learning component of its *Urban Sanitation & Hygiene for Health and Development programme*. The event was attended by 39 participants from eight countries, and focused on the 'professionalization of emptying services'.

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ACRONYMS AND ABBREVIATIONS

BWD – Baliwag Water District

FSM - Faecal Sludge Management

HUCs - highly urbanized cities

LG – Local Government

LGI – Local Government Institution

LGU – Local Government Unit

LWD - Laguna Water District

LWUA - Local Water Utility Authority

MoU – Memorandum of Understanding

MW – Manila Water

NGO – Non-Governmental Organisation

NSSMP – National Sewerage and Septage Management Program

OH&S – Operational Health and Safety

PHP – Philippine Peso

PPP - Public-private partnership

PS – Private sector

SP – Service provider

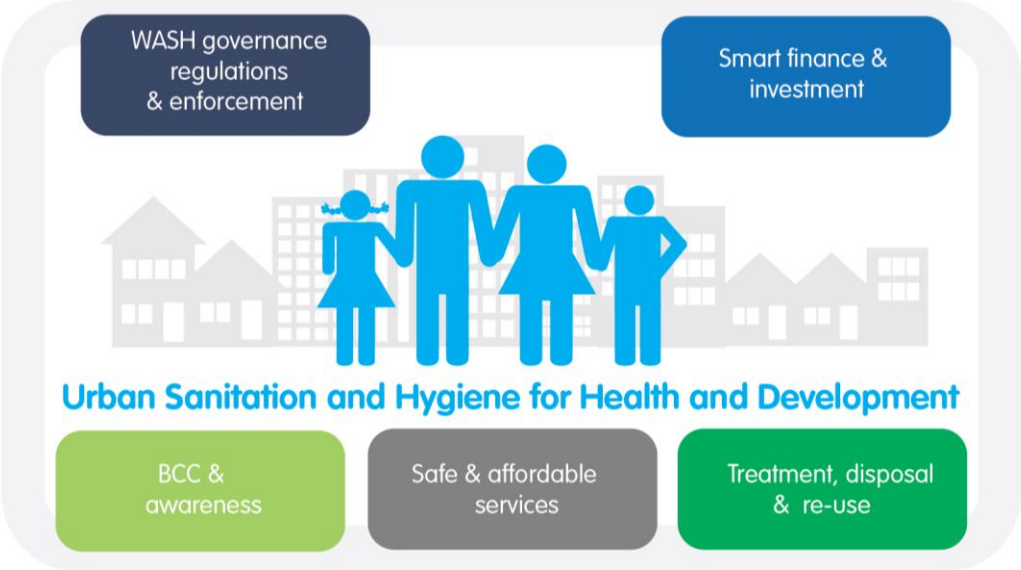
WT – Water Trust

WWTP – Waste Water Treatment Plant

BACKGROUND

This Learning Event was conducted through SNV's *Sustainable Sanitation and Hygiene for All - Urban* (*SSH4A-Urban*) program, that aims to improve the health and quality of life of people in cities and towns through access to improved environmentally safe sanitation and hygiene practices. The program was launched in 2012. SNV has four ongoing urban sanitation programmes (*SSH4A-Urban*) in Asia: Nepal, Bhutan and Indonesia with DGIS funding, and Bangladesh with Gates funding. The first three programmes have been running for two years now, and the second for almost one and half year. In Africa, SNV has one urban sanitation programme, in Kenya. This is a collaboration between a number of partners, and SNV's responsibility lies with the re-use part of the programme. In Zimbabwe, SNV facilitates a knowledge hub on urban WASH services.

In 2015, the SSH4A-U programme was re-named as: *Urban Sanitation & Hygiene for Health and Development*. In addition to the 4 existing components, a fifth component on finance was added to give a clear place to this work in the urban sanitation programmes.



The *USSHD* program has 6 components – the five components depicted in the diagram above, and a sixth on '**Improving learning, documentation and sharing of best practices'** – namely, learning, documentation and sharing of best WASH practices both within SNV, with clients, regionally and through networks. The objective is to not only to improve SNV's own practice, but also the practices of others in the sector, and to contribute to capacity development of professionals in the sector.

USSHD learning activities: The 'learning component' activities include regional learning events, online Dgroup discussions, linkages with subject specialists and research organisations, preparation and dissemination of learning papers and other resources. This component is supported by the Institute for Sustainable Futures at the University of Technology Sydney (ISF).

Learning events: Learning events are 4-day residential programs that use adult learning principles, including short presentations, discussions and many group activities including field work in a dynamic and fun atmosphere.

This is the 3rd learning event on urban sanitation and hygiene. The first learning event, held in Lampung, Indonesia in November 2013, focused on the topic of *'urban sanitation planning and finance'*. The second learning event, held in Khulna, Bangladesh in December 2014, focused on the topic of '*upgrading and emptying of on-site facilities'*.

Learning Event attendees: The 2015 Learning Event in Manila, Philippines was attended by participants from countries in the *SSH4A-Urban* program (Nepal, Bhutan, Indonesia, Bangladesh, and Kenya) and from Mali, Zambia, Zimbabwe. Overall there were 41 participants in the meeting, of which 16 are women and 25 are men. These included 4-8 participants from each country (SNV staff members and country partners). External resource people from Global Development Services, ADB, and ISF were also in attendance.

Preparatory Dgroup discussion: A Dgroup discussion was held in October and November as preparation for the Learning Event (30 November – 3 December), on the same theme of '*professionalization of emptying services*'. The topics for discussion in each of the three weeks of the Dgroup were:

- To schedule or not to schedule desludging?
- Occupational health and safety
- What is the role of smart enforcement?

A summary of the Dgroup discussion was provided to attendees as a hand-out (available at https://dgroups.org/snv/washasia/urbansan/library).

INTRODUCTION TO THE LEARNING EVENT 2015

Presentation by Antoinette Kome, Learning Event Facilitator

In this presentation, Antoinette started by providing a brief overview of the *SSH4A-Urban* program and the past learning events, and followed to explain the **focus**, **intention**, **objectives, structure** and **programme** of this **learning event**.

The last learning event focused on emptying, but it was felt that we still have not completely clear all options and implications. Moreover, the view from African countries is that scheduled desludging does not create an incentive for local government to provide good services. To create the right and professional system for emptying is clearly still a big challenge, not in the least the question of where to start. For these reasons, this learning event concentrated again on emptying services, with a specific focus on human waste (faeces and urine). Although we cannot lose sight of other streams of waste such as solid waste and drainage, this event was focused on the hygienic separation of human waste from human contact. In the area of human waste, there are at least two aspects that need much more attention: the quality of on-site facilities as well as emptying and transport. In this event we focus on the latter because this is the area on which Manila has a lot of experiences to offer.

The learning event is not just the workshop, but intended to be a process that includes the following steps:

- Preparatory Dgroup discussion
- Workshop
- In-country follow-up (depending on country priorities)

The workshop was intended at promoting discussion about best practices in urban sanitation and hygiene amongst SNV and partners, exchanging ideas and learning from each other. As was explained, the workshop was not about SNV, but about the countries each participant represented: *"this is about your countries, and what do you feel is best practice, and can work in your country. We are sitting here as professionals not representing SNV but our countries"*.

The objectives of the learning event were to:

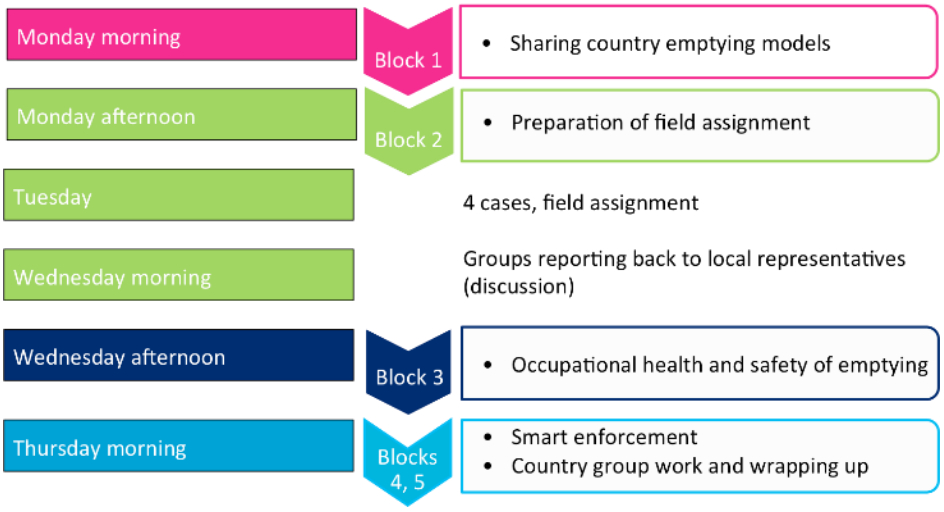
- To broaden participants' understanding of the emptying challenge for on-site facilities in particular when aiming at city wide services
- Explore and analyse different models for emptying in the Manila area
- Share and further develop business and services models for the context of each of the participants.

The workshop was structured into five learning blocks:

- Block 1: Exploring country emptying models
- Block 2: Focus on Manila case studies
- Block 3: Operational Health and Safety (OH&S) in real life

- Block 4: Smart enforcement
- Block 5: Country group work and wrap up

Programme by day



Programme

Time	*Activity*
	DAY 1 Monday 30th of November
8.30	Registration
9.00	Presentation of the programme
	Round of presentations
	Words of welcome
	Block I: Exploring country emptying models
10.20	Introductory presentation for block I
	Sharing of country emptying models
11.00	BREAK
	Plenary discussion on emptying models
13.00	LUNCH
	Block II: Focus on Manila case studies
13.30	Explanation of field assignment and formation of mixed groups
	Presentation of the context of FSM in Philippines with focus on Manila
	Preparation of field assignment
15.00	BREAK
	Preparation of field assignment (continued)
17.00	Closure
	DAY 2 Tuesday 1st of December
8.30	Field assignment (timing depends on group schedule)
	DAY 3 Wednesday 2nd of December
8.30	Welcome day 3
	Consolidations of findings and recommendations in groups
10.00	Presentation of groups to a panel (includes break)
	Reflection in country groups on block II
13.00	LUNCH
	Block III: Operational health and safety in real life
14.00	Introduction block III
	Presentation by WSUP Zambia
	Presentation by SNV Bangladesh
	Presentation by ADB
15.30	BREAK
	Block IV: Smart enforcement
15.45	Debating smart enforcement
17.15	Closure for the day
19.00	Shared dinner
	DAY 4 Thursday 3rd of December
8.30	Programme of the day
	Mapping enforcement options
11.00	BREAK
	Block V: Country group sessions and wrapping up
11.15	Set-up of the world café feedback sessions
	World café sessions
	Country group reflections
	Sharing of country group reflections
13.00	Written evaluation and closure sessions
13.30	LUNCH

Introductions and Expectations of Participants by Country

Participants were grouped into country teams and asked to think about their collective expectations from the learning event and note these down in cards. Each country group was then invited to show the location of their country on a world map, introduce themselves and share their expectations of the Learning Event. These are summarised below.

Country	Expectations
Nepal	• Learn about effective and safe desludging technology • Learn how to ensure rules and standards are effective • Learn about engaging the private sector (PS) in service provision for desludging
Bhutan	• Learn about the advantages and disadvantages of scheduled desludging • Learn about best practices of OH&S as this is major concern in our country
Bangladesh	• Learning from other countries about smart enforcement issues. How can this be done cost- effectively? • Learn about viable business models - whether other countries have applied business models that could be replicated in Bangladesh • Learn about how city administration of faecal sludge management (FSM) operates in other countries and share good examples for Bangladesh
Indonesia	• Learn about desludging practice from other countries, identify commonalities and differences and what can taken to each of the different countries • Learn about how to promote enforcement of desludging • Learn about institutional arrangements from other countries specially for desludging (in Indonesia there is a lot of variety of institutional arrangements)
Mali	• Share experiences from Mali and hear experiences form other countries • Learn about innovation and best practice in FSM • Gather information and practical ideas that can be applied to the context of Mali
Kenya	• Learn about sludge emptying and transportation practices in different countries • Learn about how business models have become socially acceptable and economically viable • Learn about roles and buy-in of different players
Zambia	• Look at options for emptying and treatment because this is the biggest challenge in Zambia • Learn from experiences of other countries on the aspect of smart enforcement and regulations, in particular regarding pit emptying and OH&S
Zimbabwe	• Learn about the best and most feasible model for emptying and enforcement of FSM to the context of Zimbabwe • Zimbabwe has no legislation regarding FSM so would like to really know how to go about this from other countries

While Asian participants mostly spoke about "septic tanks" when referring to on-site facilities, African participants spoke about pits. This led to the impression, with African participants, that Asian households all have proper 2 chamber septic tanks as can be found in text books. It was clarified that this is not the case, but that people use "septic tank" quite loosely, as a word for almost any type of containment. It is true that more urban toilets in Asia have off-set containment and more use water for anal cleansing than in Africa.

In response to some of the expectations expressed by the participants, Antoinette also noted that the learning event was not going to focus a lot on emptying technologies. One of the reasons for choosing the Philippines for the learning event, was their experience with institutional arrangements for emptying services.

Official Opening/Words of welcome

Past learning events were held in countries where SNV has a programme and co-organised with government partners, who would also do the official opening of the workshop. This year it was different, as SNV does not have a programme in the Philippines. Therefore each country team appointed someone from their country group to do the official opening. The table below provides a summary of these words of welcome.

Country	Words of welcome
Nepal	Meena Shrestha, Project Director (Superintendent Engineer) of Arid Zone Water Supply and Sanitation Project, Department of Water Supply and Sewerage • Policy and regulation aspects of FSM, as it is a problem in Nepal • How to ensure safe desludging and reuse, and how to enforce it • New and innovative technology
Bhutan	Dechen Yangden, Water and Sanitation Division, Department of Engineering Services (DES), Ministry of Works and Human Settlement • Look forward to learn from others experiences
Bangladesh	Mohammad Fayek Uzzzaman, Vice Chancellor, Khulna University • Fisheries department of the university is working with SNV • Hope learn and achieve outcomes of this workshop
Indonesia	Asri Handayani, Head of Section Area 2, wastewater sector, Directorate General of Human Settlement, Ministry of Public Works • Indonesia has a very ambitious sanitation target: 100% sanitation coverage by 2019. There is a gap of approximately 120 million people. So

	achieving the target will require serving 10% of this number of people every year. The challenge is huge. There are 505 cities and regencies but only 150 have wastewater treatment plants. So a lot of work to be done • Very happy to meet all and learn how to best achieve this target
Mali	Niafatouma Ascofare, National Directorate of Sanitation • Very grateful and happy to be at the learning event and looking forward to sharing country experience • Would appreciate if people please speak slowly
Kenya	Simon Okoth, Manager, Urban Investments, Water Fund • Currently upscaling sanitation and collaborating with various institutions • Hoping to learn from various models across the world and share some good examples of what's being done in Kenya
Zambia	Mwansa Nachula Mukuka, Engineer Peri urban, LWSC • Have ongoing collaboration with SNV. Have just implemented their first FSM on-site system. So hoping to share lessons learned from that so far and learn lessons from other countries particularly on health and regulations
Zimbabwe	Edwick Enia Veremu, Civil Engineer, Public Works Department, Government of Zimbabwe • Zimbabwe is serviced mostly by offsite systems • There is no legislation regarding onsite systems, so hoping to learn from other countries

1 BLOCK 1: EXPLORING COUNTRY EMPTYING MODELS

OVERVIEW OF BLOCK 1: Exploring country emptying models

Why is this relevant?

Several countries have made progress introducing emptying services for septic tanks and pits, and/or improving existing –informal- emptying services in their city. A good starting point for learning from each other's experiences, is to understand the emptying service models available in each country. Sharing was done through visualising in the form of diagrams. This is aimed at assisting in identifying similarities and differences across countries and identifying key areas of risk for prioritisation of efforts.

What knowledge and learning outcomes were intended from this block?

- Understand the emptying models available in each country, and the similarities and differences across these in terms of technology and processes used, financial and information flows
- Identify key areas of risk in each emptying model
- Experiment with drawing emptying model diagrams to developing visual understanding of emptying services

What was the process?

1. Country group work to draw diagrams of the emptying model of each country. This was followed by group presentations of the emptying models
2. Plenary discussion about the emptying models presented
3. Identification of key risk areas on the emptying model diagrams

1.1 Introduction to Block 1, summary of D-group discussion on this point

Presentation by Antoinette Kome, Learning Event Facilitator

Antoinette started this presentation by highlighting that sometimes *"when we talk about emptying models we think about technology and that's very important because it allows us to do certain services."* For example, the vacutug technology is very important because larger trucks often can't reach certain remote areas. However, sludge emptying models is broader than truck technology. The way we organize the service is also very important. The first topic of the Dgroup discussion concerned this and focused on the question of whether desludging services should be scheduled or provided on a demand basis.

In on-demand desludging emptying is done wherever and whenever the households calls, so it only covers the people that calls for the service, which tends to be in emergency situations, and often too late to avoid problems. Scheduled demand in turn, ensures greater coverage. It involves greater responsibility for authorities and requires database of when different households need to be emptied

and what type of systems they have. However, there is still the issue of the households' willingness to empty their systems.

Input from the Dgroup discussion on the topic 'to schedule or not to schedule desludging': There was a clear division between those in favour and against desludging amongst contributions to this topic. The table below summarises some of these contributions.

On-demand desludging	Scheduled desludging
• Building owner decides whether and when to empty. Only covers the people that call for the service, which tends to be in emergency situations, and often too late to avoid problems • Often direct financial transaction between emptier and owner • Assumes that the owner knows when to empty • Better link between payment and quality of service	• Authority sets up an emptying schedule to make sure that all households practice "timely emptying" as opposed to "emergency emptying". • Requires that local government capacity to set up an emptying schedule. • Payment usually not at the same time& place as emptying • Government can just charge and do nothing • Risk of unnecessary high prices • Doesn't necessarily lead to healthier environment if tanks keep leaking • Requires and investment (e.g. infrastructure, database, etc.) and often resources for this is not available

It was emphasized that we shouldn't assume that one system is better than the other. Each has advantages and disadvantages, and questions we have to grapple with. The risk, under scheduled emptying, that households pay for a service which is not provided, is real.

We should also not assume too easily that on-demand services are much cheaper than scheduled emptying. If we would like to ensure timely emptying, on-demand emptying would require a system to send reminders for emptying and enforce that. Malaysia has a regulated on-demand emptying system in which the service provider has a database of all on-site facilities, and send reminders to the households when it's time to empty. Other challenges include defining the price for a service.

The bottom line question is whether the decision about whether and when to empty should be left with the household (building owner). Sanitation is a community problem. Sanitation isn't a household problem. It's a community problem, as bad behaviour from one person affects the community. In this light, should we make it a household decision to decide when/whether to de-sludge? Can we assume the owner knows when to empty and will call for the service before it becomes an emergency?

Structure of Block 1:

In their country teams, each group developed a diagramme for the emptying model(s) in their country, considering the faecal sludge flow, the financial flows as well as the information flows. With stickers risks were indicated (orange stickers for risks for the population or environment, yellow stickers for risk for the operators).

1.2 Country presentations on emptying models

Each country group selected a member from their team to present their emptying model diagram.

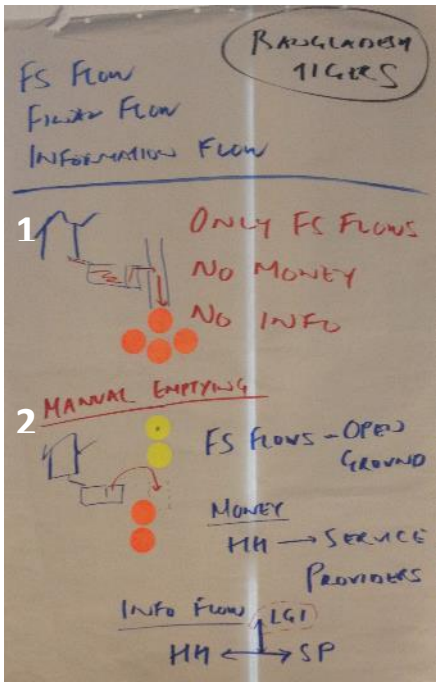
1.2.1 Bangladesh

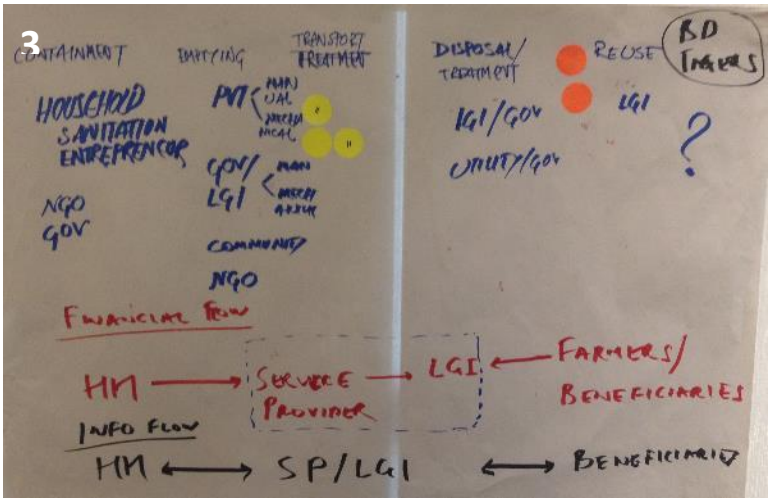
In Bangladesh different "emptying" models are available:

1. **Toilets and septic tanks are directly connected to drains –** this is widely practiced and in majority of the cases soak/leach pit doesn't function due to high water table. In this case, there are no money or information flows.
2. **Manual emptying of tanks and pits** - households contact manual emptiers. Some of these are registered with a local government institution (LGI), and others are operating independently. Often they dig a hole and dump the faecal sludge there. Information and money flow from the household to the service providers (SP) in this case the manual emptiers. Generally, households know who the emptiers are and these also often go around the neighbourhoods looking for emptying opportunities.
3. **Manual and mechanical emptying of tanks and pits** – this model is in pilot stage. In this case the service providers (SPs) can be private sector (PS), community based organisations (CBOs), LGIs, or NGOs. In all cases within the model, service providers haven't invested in infrastructure. For example, service provider 'Gulshan Clean and Care' has been supported WSUP and UNICEF to buy the vacuum trucks. These have been bought in the name of the Dhaka utility who leased these out to the service provider. In another case, UNDP bought vacuum trucks and CBOs who are the service providers use it. Most sludge goes to drain and not to designated sites. Designated sites are a public investment and there are pilot projects from the government with support from ADB and others, which provide designated sites. Some of these pilots are looking into to the possibility of reuse by farmers (beneficiaries). The idea is that farmers pay the LGI and the service providers for this end product. However, currently government has not released a license that allows for the commercialization of the end products. Most people in Bangladesh are Muslims and there is also a cultural barrier to reusing compost from faecal sludge, although attitudes regarding this are changing.
4. **Centralised sewerage** - this is available in some areas of the capital city. Utility charge a tax and monthly tariff is included within the water bill.

Recently the government has approved one schedule where if any of the LGI (Municipality) wants to provide the FSM service they can charge up to 12% of this holding tax. But there is an ongoing debate on this concerning whether LGIs are capable of providing this type of service and whether the

governance structure supports the entire coordination of this service amongst different ministries and departments required for the effective provision of FSM services.





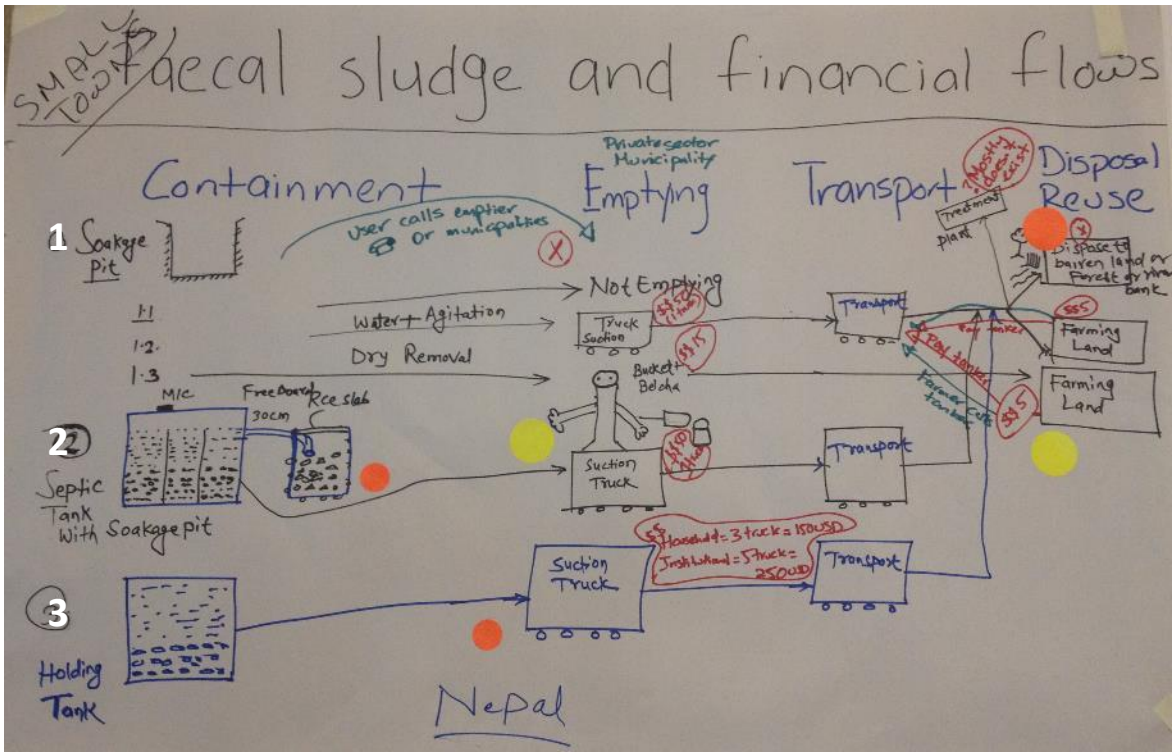
1.2.2 Nepal

In smaller towns in Nepal, there are three options for sludge containment:

1. **Soakage pits** – this represents the biggest proportion of the cases. The sludge is often emptied within an interval longer than 10 years, or not emptied at all, in which case, there is no money or information flows. If emptied, the method used is manual emptying (cost: USD 15) or through the use of vacuum trucks (cost: USD 50/truck). The sludge is often very solid, and to empty with a suction truck water must be added, mixture agitated, and sucked out.
2. **Septic tanks with soakage pit** – this is usually only found in government and institutional buildings and hotels. The sludge is typically emptied with vacuum trucks (cost: USD 50/truck).
3. **Holding tanks** – these are emptied using vacuum trucks (cost for households, who need on average of 3 trucks is USD 150/service and for institutions, who on average need 5 trucks is USD 250/service).

In most small towns in Nepal, there is no existing treatment plant. This means that in small towns the faecal sludge is dumped onto barren land, in riverbeds, in the forest, or onto farmers' land (without treatment) where it is reused as a fertilizer.

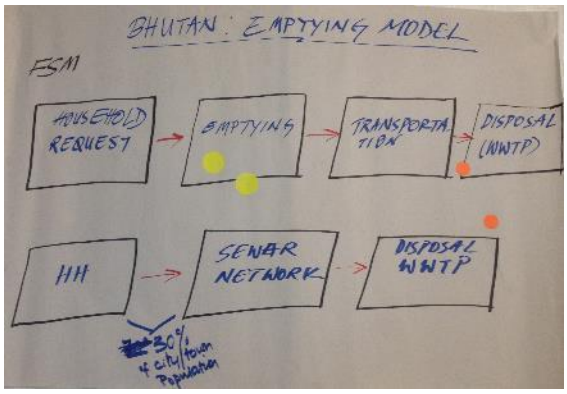
The information flow is directed to one party: the emptier, which can be a private business or the municipality. When a containment facility needs to be emptied the owner calls the emptying service/service provider. In the case of reuse of sludge as a fertilizer, the farmer calls the emptier to dump the sludge onto his land.

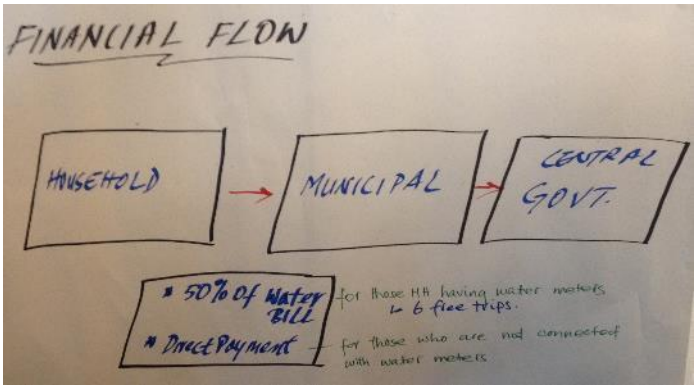


1.2.3 Bhutan

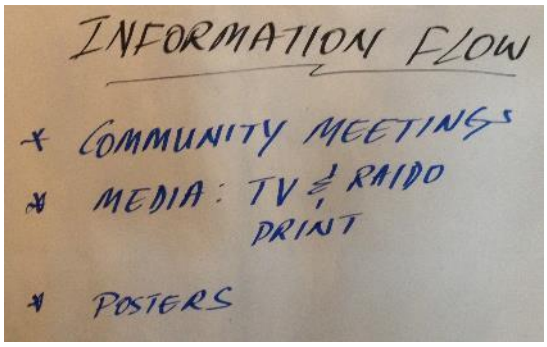
In Bhutan, there are two "emptying" models:

1. **On-demand desludging service provided by the municipality** – the household requests the municipality by putting in application for the service. The Municipality then set a date for the desludging and sends the cesspool truck to the household and transports the sludge to the disposal site. If the household is near the sewer network, then they dump it into the nearest manhole or transport it to the wastewater treatment plant (WWTP). Houses with connected to a water meter, are charged 50% of the water bill monthly. This cost covers for the cost of 6 free desludging service trips. If the household doesn't have a water meter, then they have to pay cash deposit when submitting the application of the service to the municipality (cost: USD 31/trip). The municipal office then informs the central government about this payment and requests it to register the fund.
2. **Centralised sewerage system** – this is less common and represents 30% of the town population





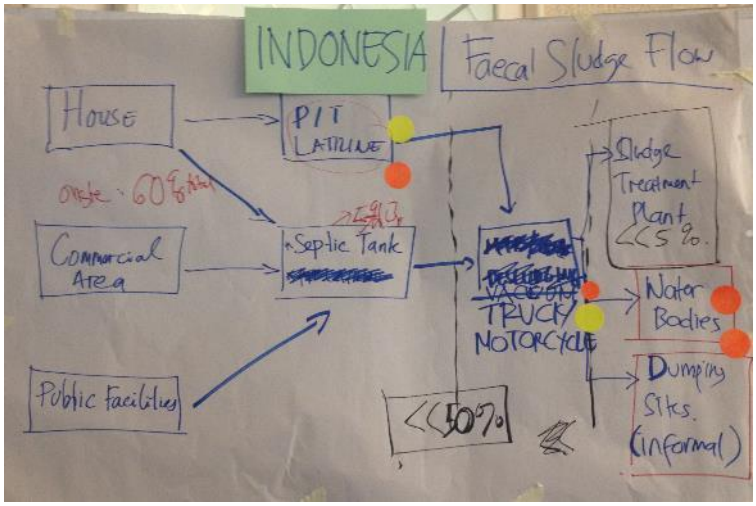
Concerning information flows and dissemination of information about FSM services, this is done through community representatives. There are two district government office meetings per year and community representatives are present at these meetings. Other channels of dissemination of information include media such as newspapers, and posters. Another example is Bhutan toilet who organisation led a mass awareness campaign on cleaning of public toilets. On World toilet day they gathered people around a certain area to clean public toilets.



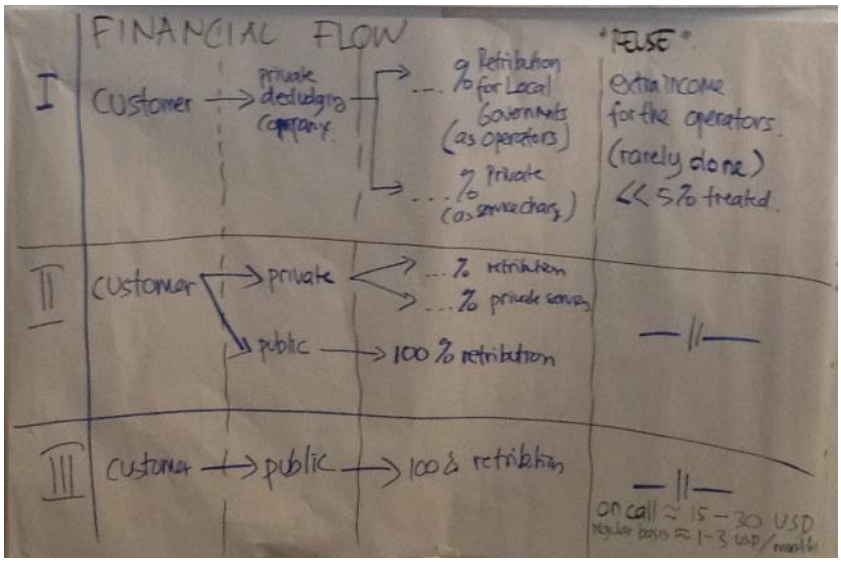
1.2.4 Indonesia

In Indonesia there are three types of faecal sludge sources: households, commercial buildings, and public facilities. On-site systems represent approximately 60% of the sanitary facilities in the country. Households can have pit latrines or septic tanks (some standard and other not according to standard), whereas commercial and public facilities have septic tanks (generally according to standards). Overall less than 50% is transported using suction trucks or motorcycle (for small streets), and of this less than 5% goes to a treatment plant. Most of the sludge is unsafely disposed in water bodies or informal disposal sites.

In four cities the sludge is disposed in WWTPs (like in Bhutan), however in the case of Denpasar this has been found to disturb the WWTP treatment process.

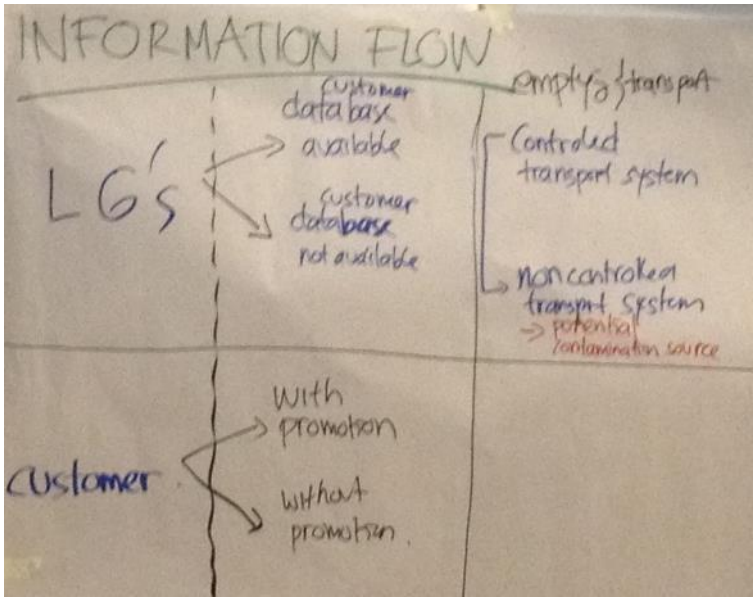


There are two types of service providers: private and public. Some cities have only private service providers or public service providers, whereas others have both. In the case of public service providers, the financial flow goes from the household/customer to the public service provider. Some cities have an on-call service (cost: USD 15-30/trip), whereas others have a regular service where the household pays USD 1-3/month. In the case of private service providers, a proportion of the fee paid by the household/customer goes to the private service provider and another proportion goes to the local government to pay the treatment plant operators. There is some extra income for the operators if they have reuse of the end product, although this is rarely done (less than 5%). However, private service providers often avoid paying the local government by dumping illegally.



Some local governments have customer databases, particularly in cases where they water supply services. However, most don't have. Some cities have also implemented control transport systems, so they are able to control how many septic tanks were desludged in a day and how many actually go to the treatment plant.

In most cities there is no promotion of FSM services done by local government. Households become aware of FSM service through private sector providers' advertisements in the media (e.g. newspapers) or through public health agencies.



1.2.5 Mali

In Mali, the collective sewerage concerns only a small part of the population (less than 2%) while autonomous sanitation used by more than 85% of households, is the most widespread system. The remainder of the population of Mali use neither one nor the other.

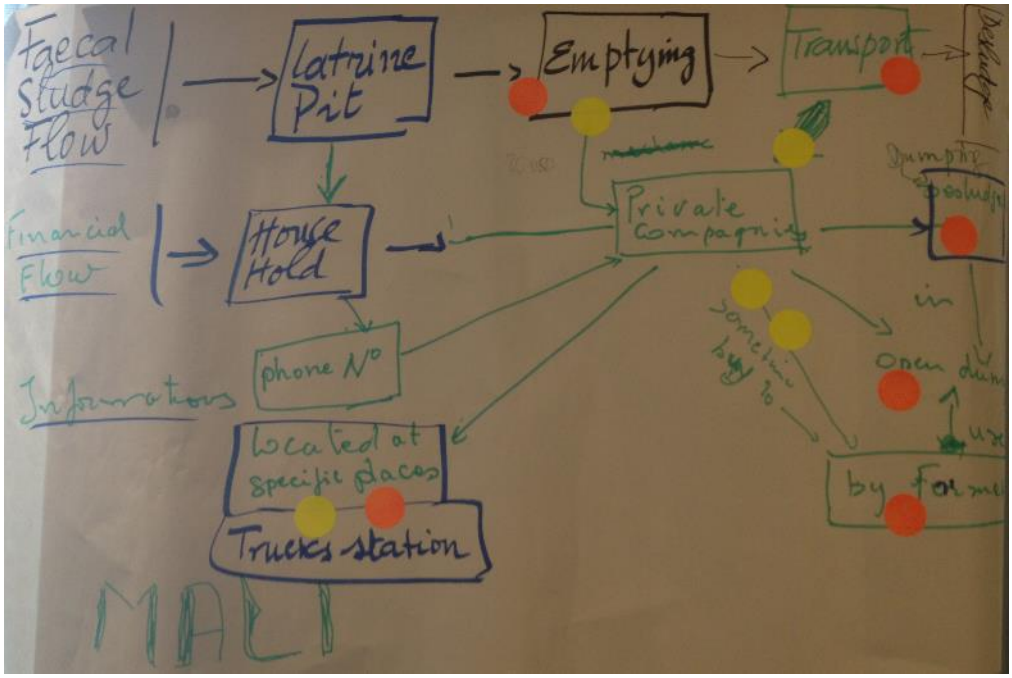
The Faecal Sludge Management (FSM) from autonomous sanitation structures are real problems especially in terms of collection, transport and treatment. According to statistics from the National Directorate of Sanitation and Control of Pollution and Nuisances (DNACPN), sludge from different wastewater pits are estimated at 600,000 m^3 / year.

The collection and transport of faecal sludge are rarely provided by the competent authorities. They are most often handled by informal operators (mechanical drain companies and manual emptiers) with disastrous consequences for the environment and human health. Indeed, tons of sludge is discharged daily in nature without any treatment.

The actors involved in Faecal Sludge Management including the state through DNACPN, the Municipalities, the Private Operators (mechanical or manual emptiers), NGOs, Associations and the population (Users). In Bamako, Faecal sludge treatment plant was built without involvement of the collection and transport operators, who were not given adequate consideration in the location of the plant. It was thus built too far out of the town, and the collection and transport operators could not afford to drive to the facility between the collection at each onsite technology. As a result, the facility was never utilised, and has since been abandoned.

In Mali, emptying services are provided by private sector (PS) companies on an on-demand basis. There are also manual emptiers that operate in the informal or underground. Households contact the PS company and pay a fee for the service (cost: USD 50-80/one-time service). The vacuum trucks carry phones and cell numbers, which enable call them when needed. These dump the sludge in the open or sell it to farmers without any treatment. There is no control of quality of the sludge. Desludging is an informal activity, as it's not licenced. The monitoring/control made by the Department of Environment is quasi inexistent. Lack of place of sewage discharge and the lack of treatment of sludge is a big problem in the country.

In the case of commercial building such as hotels, these have to have their own treatment plants. Some luxury hotels have already their own small stations and make preliminary pre-treatment.



1.2.6 Kenya

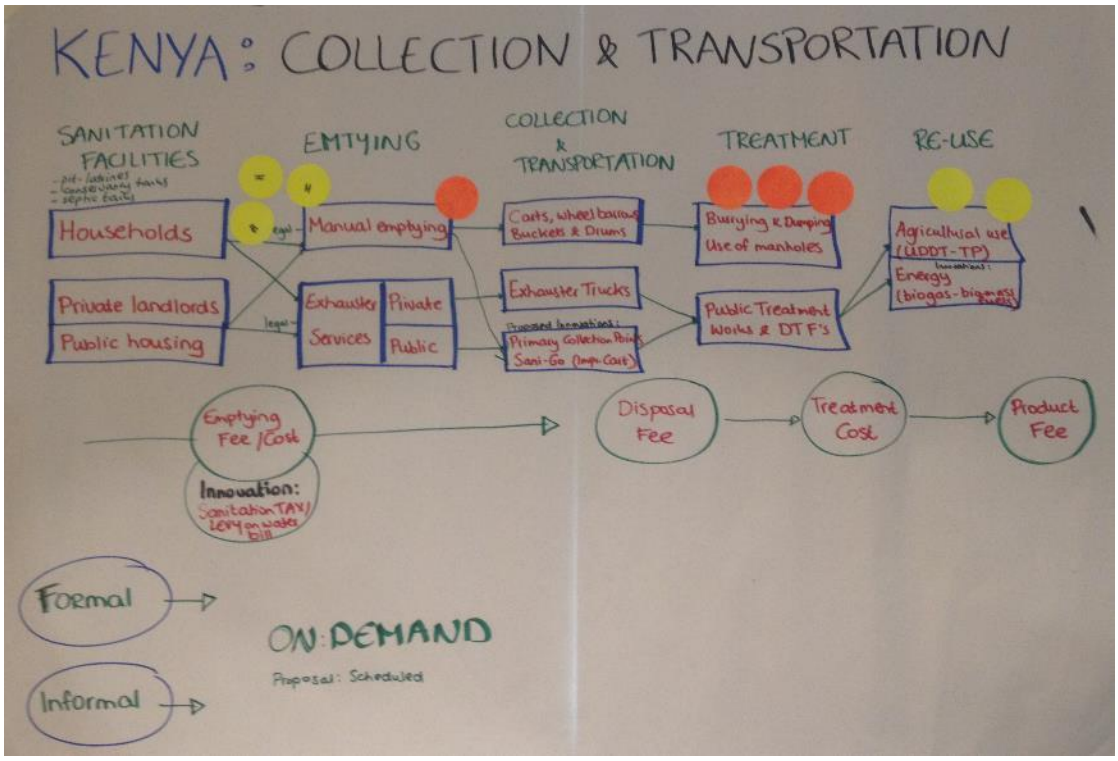
In Kenya there are three types of sludge containment systems: pit latrines, conservancy tanks and septic tanks. In urban and peri-urban areas, pit latrines are the most common systems (over 50%). There are also three types of landlords: households, private landlords, and public housing (where the government is a landlord).

Emptying services are provided on-demand by illegal manual emptiers using carts, wheelbarrows and/or buckets, drums, or legal exhauster services provided by public or private service providers using exhauster trucks. Manual emptying is normally done at night and the sludge is buried or dumped in manholes or the environment. In the larger towns there are public treatment works where legal public or private exhauster service providers are supposed to dispose the sludge. In Nakuru, there is a pilot using primary collection points (mobile transfer stations) aimed at facilitating safe disposal of the sludge by service providers from low-income areas of the town. There are also pilots for agricultural re-

use (bio-fertiliser in the form of Struvite and (vermi-)compost) and energy reuse (biogas and fuel-pellets or briquettes). One of the aims of these pilots is to produce a commercially viable product that can contribute to face agricultural and energy challenges and which can potentially recover some of the costs of the treatment.

The emptying fee is normally agreed between the householder and the service provider – there are no standards for this. In the case of exhauster trucks, there is a licencing fee and a disposal fee (although the disposal fee is very low). Programmes like the one in Nakuru are organising pit-emptiers in associations and work towards legalisation of pit-emptying with the gulper technology and standardisation of prices. Other programmes are supporting pit-emptying in other towns through for example the development of a chart to transport sludge in low income areas, the Sani-Go.

In Nakuru, a sanitation levy on the water bill is being proposed by the local water company aimed at recovering some of the costs of the service which includes scheduled desludging per area using the primary collection points and pit-emptier associations. For example, in a given area where this type of transfer stations is available, an announcement would be made to households to empty their pits during a certain period. This will be supported by awareness raising campaigns and support of the Public Health department.



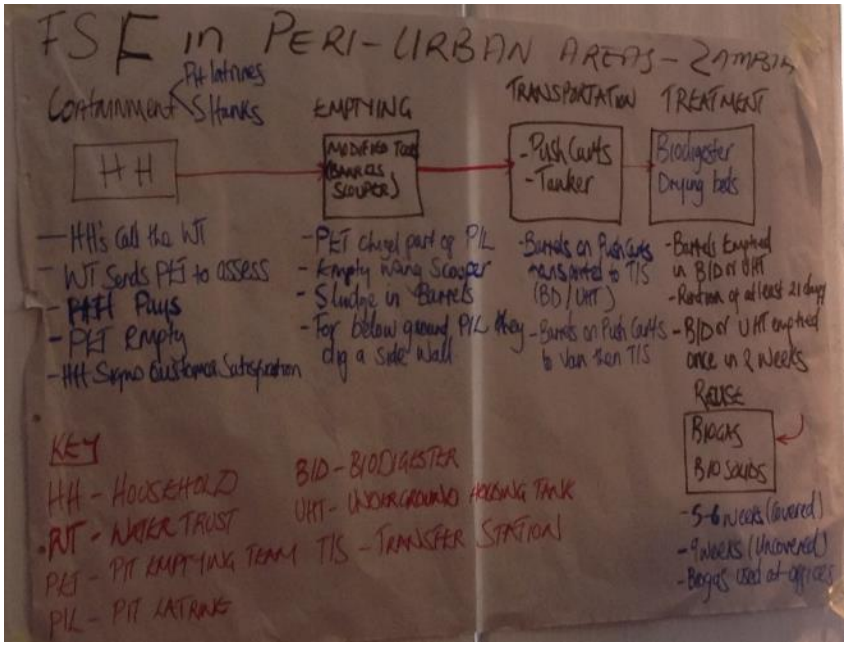
1.2.7 Zambia

In Zambia, urban areas are served by centralised off-site systems. In Lusaka city, turn the most common sludge containment system in peri-urban areas is the pit latrine. In these areas, FSM is regulated by Lusaka Water and Sewerage Company but is a delegated service to the Water Trust (WT).

Households call WT, and these send the pit emptying teams to assess and empty the pit latrines using modified tools (e.g. barrels). The sludge is transferred in most cases using pushcarts (particularly in areas of difficult access). Sometimes the pushcarts are used to transfer the barrels containing sludge to transfer stations, which are normally approximately 2Km from the households. The treatment includes a bio digester (primary treatment) and drying beds (secondary treatment). Biogas is used for cooking at the offices where the transfer stations are located. Not significant volume of gas is generated since most of the gas evaporates. The sludge is also sold to farmers and households (but not for food, only gardens).

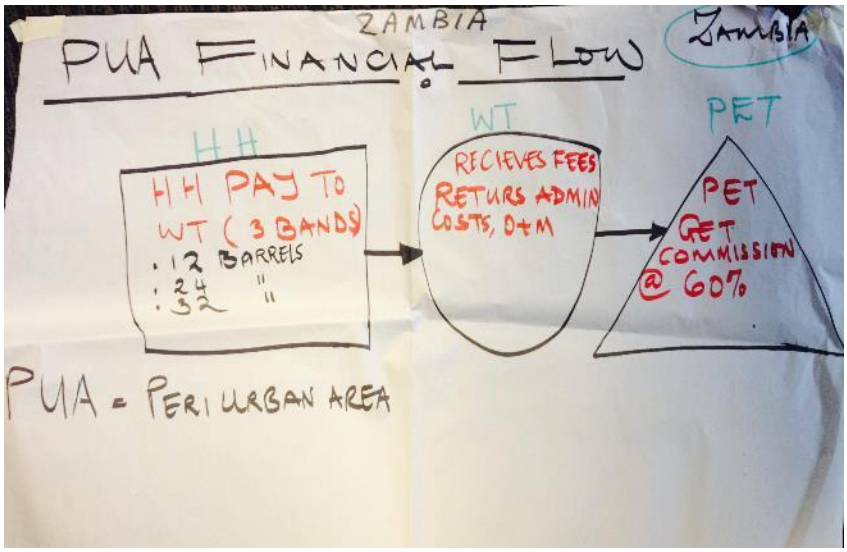
There are two types of covered drying beds:

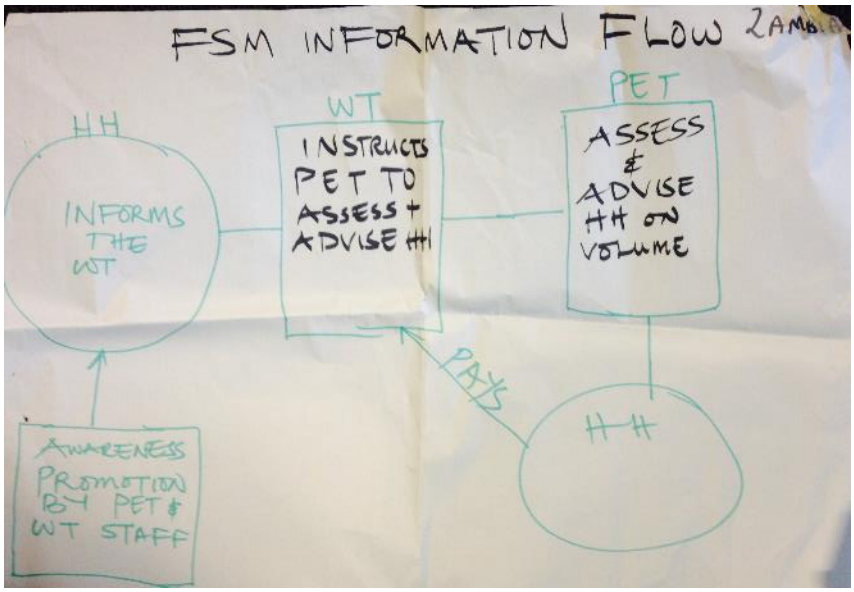
- Covered - takes about 5-6 weeks to be ready to be uses as manure or disposal
- Uncovered - takes about over 9 weeks to be ready to be uses as manure



Once households pay the fee, the WT issues information to emptying teams to proceed with the emptying job. The WT uses part of the fees paid by the households to pay the pit emptying teams (commission based payment).

Concerning promotion of services, this relied mostly on the pit emptying teams going around the communities to promote the service. Now this is being supplemented through marketing and promotion campaigns by the Neighbourhood Health Committee volunteers who conduct urban PHAST. These volunteers are given a zone comprising a few houses and take health and hygiene messages door to door. It is during these visits that the awareness and promotion of FSM services is also made.

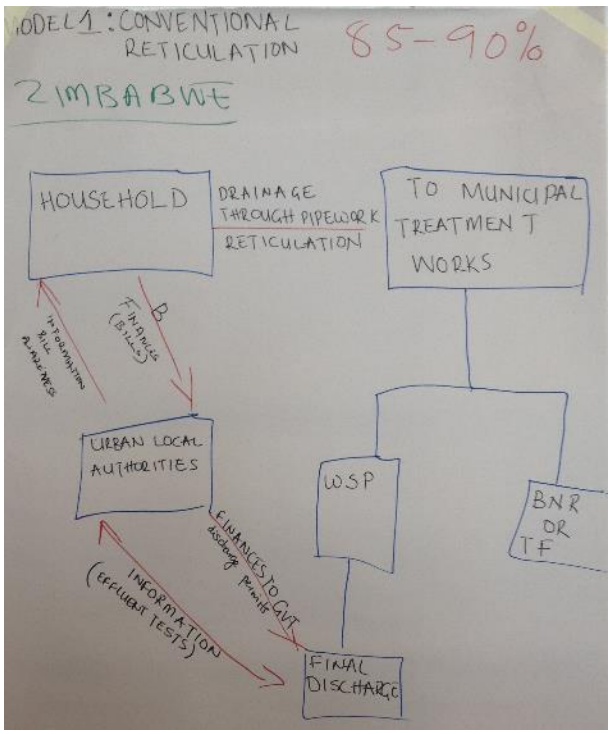


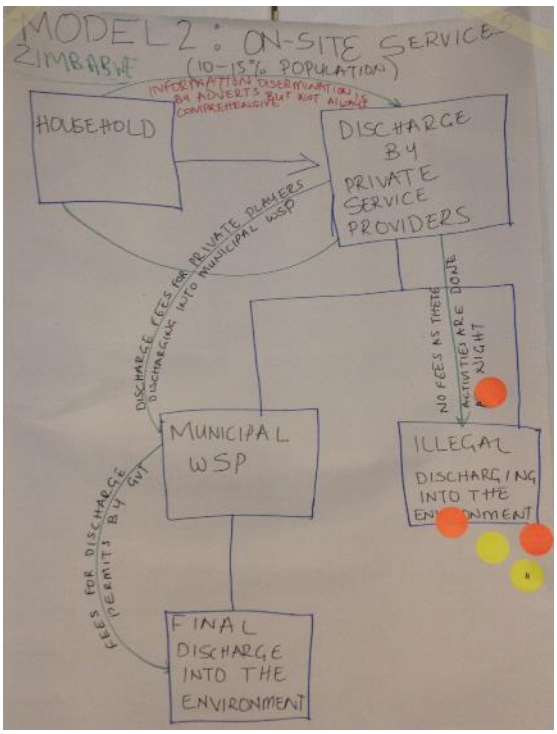


1.2.8 Zimbabwe

In Zimbabwe most of the urban population is served by off-site systems (85-90%). Sewerage is drained through pipework reticulation to municipal treatment works. Households pay the urban local authorities for this service. The urban local authorities are the ones who issue permits for discharge into the environment by the municipal authorities.

The rest of the urban population (10-15%) is served by on-site systems and private desludgers. These discharge the faecal sludge into the municipal treatment plant and pay a discharge fee for that. The municipal authorities in turn have permit to discharge into the environment issued by government. However, an unknown proportion of service providers discharge into the environment illegally, often at night-time.





1.3 Plenary discussion

After the presentations of the FSM models, each country group was invited to comment on interesting points they had heard from the presentations. The table below summarises these points.

Country	Comments
Nepal	• The word retribution from the Indonesian group presentation caught our attention. In Indonesia, it seems that some of the fee goes to municipality to cover for the public costs of the treatment plant. But there didn't seem to be any incentives in place to encourage the service providers to discharge at the treatment plant. This contrasts with the case of Nepal where the fee goes all to the private service provider
Bhutan	• In Zimbabwe they are engaging private desludgers. In Bhutan we don't have private sector engaged in this sector. Interested to find out how are they being monitored in terms of what they charge or is up to them to decide? Are they regulated?
Bangladesh	• In Indonesia they charge USD 6/1000 litres and in Bangladesh they are charging a similar amount • Mali seems to be doing well in managing their systems. However, the issue of selling faecal sludge to farmers without it being treated need to be taken care of

Country	Comments
	• In Bhutan they are creating a very good awareness change. Interesting the way how they used religion to create awareness along with the youth programme
Indonesia	• In Bhutan they are charging a 50% levy on the water bill. Interested to find out how to make people follow the rule? Is there a penalty (e.g. cut water or electricity)? How can we do this in Indonesia?
Mali	• Found the case of Zimbabwe interesting and would like to find out information on how they manage FSM because there is a big difference from what is done in Mali • In Mali the private sector sells sludge to farmers. This is illegal but in practice it happens. It's important to recognise this
Kenya	• Found interesting that in Zimbabwe most faecal sludge is treated at a treatment plant whereas in Kenya is the opposite
Zambia	• There is a lot of effort involved in collecting the sludge but in most cases people don't have a place to dispose. This seemed to be the case of Nepal, Bhutan, Mali. The challenge is that most utility companies, which are heavily supported by government, are not performing their sewerage duties • When Zambia started its FSM programme, drying beds were located in outside the settlement. This is because households thought it was going to a smell issue. Experience showed that there was no smell problem and therefore in the second FSM service, the drying beds were located inside the settlement together with the bio digester. This thus has reduced the cost of paying for a tanker to empty the bio digester to go and dump away the sludge since all facilities are in same location. When BD is full, the sludge is pumped directly to the drying beds and dried. • Zimbabwe stands unique in coverage of centralized sewerage. Interested in what their tariffs are as this a common challenge for African countries. Also interested to find out why do they have high coverage. Is it the legacy of colonial regime? If there is a good thing about colonial regime is the infrastructure • Food for thought: there is quite a big cost involved in running off-site systems. Maybe we can think forward so that what we're responding to covers other sustainability aspects. Our pilots focus on human waste on-site facilities. Can the on-site facilities be sufficient to cover for growth issues we'll be dealing with in the future?
Zimbabwe	• Zimbabwe has a good system but there is one huge risk. That is if the water system fails, then everything is in crisis. People move from flush toilets straight to open defecation. In 2008 there was a serious cholera

Country	Comments
	crisis as result of this • Need to have sustainable financial resources, scheduled maintenance of pipes. It's a huge investment. Have to sink in a lot of cost for this • Reflection on the Kenya presentation concerning issues of regulating FSM. Is the issue very weak institutions and lack of capacity to enforce legislation or communities not mobilised sufficiently? • In Zimbabwe the way areas get to be defined as growth areas (from a local body, to town council, then municipality, and then city) is based on its infrastructure. We cannot declare a city until it has a particular infrastructure

3 BLOCK 2: FOCUS ON MANILA CASE STUDIES

OVERVIEW OF BLOCK 2: Focus on Manila case studies

Why is this relevant?

In Manila there are examples of different models of emptying services that have been running for a number of years. Lessons learned from these case studies can provide examples of FSM approaches that can be applicable to other contexts.

What knowledge and learning outcomes were intended from this block?

- Understand the different emptying models in the area around Manila in terms of risk, robustness and effectiveness
- Understand the success factors of the different emptying models in the area around Manila and their applicability to each country context
- To gain new ideas of approaches to FSM and business models
- To gain new ideas of incentives and motivators ("carrots" and "sticks") to support the functioning and sustainability of a FSM system

What was the process?

1. Preparation for the field assignment
2. Presentation about Septage Management Systems in the Philippines
3. Field visits/assignment to Septage Management Systems
4. Group presentations of field visits/assignment
5. Reflection of takeaway learnings from field visits/assignment

3.1 Preparation for field work

Preparation for fieldwork consisted of a presentation from Antoinette explaining the fieldwork assignment followed by a presentation from a guest speaker about FSM in the Philippines.

3.1.1 Field assignment set up

Day 1, 30th November 2016

Participants were divided into four mixed groups of SNV and non-SNV people, and government and non-government people. Each group had a representative from each country. The idea was that workshop participants from a given country would have covered all case studies.

The field visit locations included:

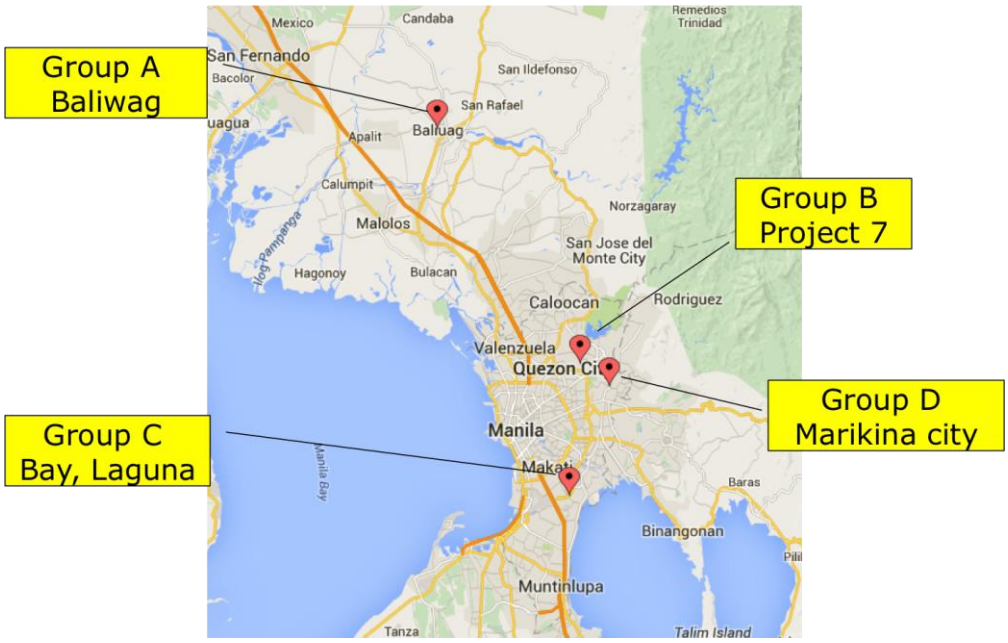
A. Baliwag

B. Project 7

C. Bay, Laguna

D. Marikina City

Each group visited a different FSM system (see map).



The activity involved each group to prepare:

- A photo-diary
- A 2-page case description (generic overview)
- A testimony

- A PowerPoint™ presentation with impressions and recommendations

The assignment questions were:

- How does the system function?
- What does this system achieve? (in terms public health and environmental protection)
- How solid is the system? How sustainable is it? Will it sustain itself or breakdown overtime?

As preparation for the fieldwork participants were asked to:

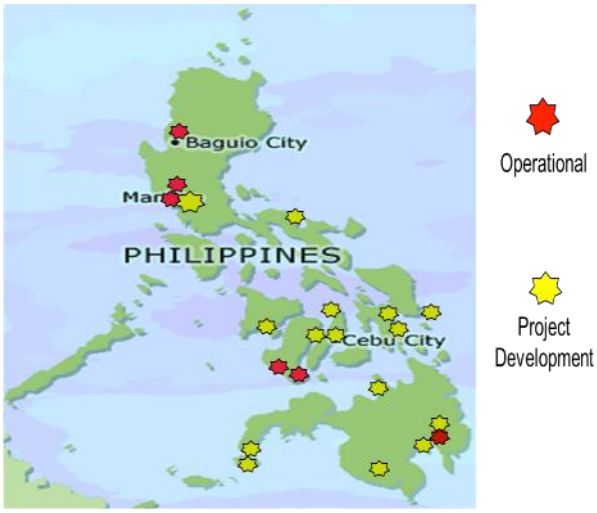
- Agree on what would they like to know
- Prepare their own questions
- Clearly divide roles and responsibilities in the group
- Make sure that everybody is involved in spite of language barriers

3.1.2 Instituting Septage Management Systems in the Philippines

Presentation by Nene Narvaez, Independent Consultant

Brief demographics background: Moderate rapid population growth. In 5 years rose from 92 to 100 million people. There are 144 cities in the country and 35 of these are highly urbanised cities (HUCs). There are 1,490 municipalities. These are classified according to income class. There are six classes (I-VI) depending on the general revenue of the municipality, and these are able to access financing differently. Lower income group classes have access to grants for development projects.

Sanitation background and coverage: studies show that 58% of the country's groundwater is contaminated and that 64% of the rivers don't meet the drinking water criterion. Only 10% of the population have access to piped sewerage.



Regulatory background: In 2004 the Clean Water Act was passed. Within five (5) years following the passing of this Act, the Agency vested to provide water supply and sewerage facilities and/or concessionaires in Metro Manila and other highly urbanized cities (HUCs) as defined in Republic Act No. 7160, in coordination with LGUs, shall be required to connect the existing sewage line found in all subdivisions, condominiums, commercial centres, hotels, sports and recreational facilities, hospitals, market places, public buildings, industrial complex and other similar establishments including households to available sewerage system. Provided that the said connection shall be subject to sewerage services charge/fees in accordance with existing laws, rules or

regulations unless the sources had already utilized their own sewerage system. Provided, further, that all sources of sewage and septage shall comply with the requirements herein.

In areas not considered as HUCs, the DPWH in coordination with the Department, DOH and other concerned agencies, shall employ septage or combined sewerage-septage management system.

This Act allows the LGUs to provide land for the septage management program and charge user fees to be able to collect revenues and recover cost of investments. After the passage of this law there was no clear financing for projects. In response to this, in 2009 a framework was prepared – National Sewerage and Septage Management Program (NSSMP). Under this framework, the national government committed to co-share at least 40% of the cost of sewerage projects in highly urbanised cities (HUCs) and provide technical support (assistance is provided by the Department of Public Works and Highways). Unfortunately no city has availed of this co-share. This raises a question: How come none of the 35 HUCs have availed this financial contribution? The main reason for this is that the Department of Public Works and Highways (DPWH) has not finalized its procedures on how a city should apply, or how applications will be reviewed. Another reason is because 40% is not enough to cover for the large upfront costs. So an amendment is being proposed in congress for the co-share to be 50% for sewerage projects and 80% for septage management programs. However this needs to be accompanied by promotion and awareness raising advocating for septage management.

Current septage management programmes: To date programmes have been developed and funded by local government units (LGUs), Water Districts, and private sector. There is a mix of different arrangements and partnerships between these actors.

- **Equal partnerships between LGU and water service providers** – this is the case of Dumaguete City Septage Management Program. There is equal sharing between the LGU and the water district on capital expenses (50%-50% sharing). The LGU passed legislation requiring all households to do desludging regularly (once every five years). If there is a need to empty the septic tank more than this, then the household has to pay an extra amount on top of the fee for regular desludging. The Water District does the operation of desludging of the septic tanks and the LGU operates the treatment facilities. Tariff collection is done by the Water District and tapped into the water bill. When there is a net income they share. This model has proven to be very successful. From one desludging truck in 2007 they now have 8 trucks.
- **Other partnerships with other local government units (not necessarily equal co-sharing)** – this is the case of Baliuag Septage Management System, in Bulacan. In this system the Water District is doing everything in terms of capital investment and operation. The local government support consists of issuing a local ordinance, which mandates regular desludging and imposes a penalty to households who don't desludge.
- **Local governments to outsource septage management systems** – this is the case of Cebu City, General Santos and Bay, Laguna. The local government passed legislation that supports the program but it is the Water District who is managing the whole program and outsources the desludging and operation of the treatment plant to the private sector.
- **Partnerships with International Non-Government Organizations (INGOs)** – this is a very highly

incentivized program targeted at some towns struck by Typhoon Haiyan. A revolving fund has been made available by an NGO (Oxfam) and local governments can avail this fund at zero interest rate with a payback period of five years. These are small municipalities and the amount they need is about 4.6 million PHP (approximately USD 100,000). There are some requirements to access this fund. They have to pass a local ordinance showing how to recover cost/revenue stream and ensure the money goes back to the revolving fund and other local governments have the opportunity to also use the fund. They also have to have land. They also have the option to outsource operations if they want to. The fund is being managed by a local NGO partner.

- **Technical and financial assistance from the INGOs** – this is the case of San Carlos City in Negros Occidental. Most of the local governments are not very knowledgeable about sanitation. Technical, legal and financial planning and management assistance is often required. In this mode the INGO provides funding for this type of assistance and training.
- **Partnerships between adjacent local government units (LGUs)** – this is the case of the Municipality of Alabel and General Santos City. Municipality of Alabel has a septage treatment plant but this is overcapacity and it's too expensive for them to operate it alone. Thus they invited General Santos City, who doesn't have a septage treatment plant, to discharge at their plant. Negotiations are underway.

Challenges in financing septage management: one of the challenges of financing septage management is that local governments are often reluctant to invest. They have limited resources for up front costs, inadequate knowledge of sanitation, and limited capacity to manage programs. Also some local governments are not willing to borrow or look for external sources of funds as they fear that septage manage will not generate enough revenue to recover the costs. There is also a perception that customers have limited willingness and ability to pay for services, although studies have shown the contrary. Some of the options around this include offering instalment payments and tapping into the water bill. Sanitation services can be financially viable when they are customer-oriented and perceived as being worth paying for. Studies have also shown that it's not actually the willingness to pay by communities that is the biggest problem but the local government willingness to charge because it's a political issue, particularly in elections time. Finally, a big challenge is that sanitation is often not on the priority list. Hence promotion campaigns to raise awareness that sanitation is not a cost centre and it can be a revenue centre are needed.

Q&A:

Q: Often progress is made when local government understand the challenges. Here in the Philippines how do you approach local governments?

A: This is still a challenge. There have been a lot of campaigns in the past. We go to the people and get them to understand that this is something they need to do. We ask health and environmental officers to come with us, so they can explain that without a septage management program water will be affected, and that the program will not pollute the air and cause bad odours. This is still a challenge though.

Q: Going back to your slide with figures on coverage. When talking about 10% having access to piped sewerage, does it mean that the remaining 90% has access to on-site systems? And are the 90% being penalised?

A: Most of the 10% are in metro Manila. We have two service providers that have sewerage systems metro Manila but 90% are to be covered by septage management programs, meaning there is a desludging truck that goes and empties the septic tanks. The 90% are not being penalised, except in the municipalities that have passed the local ordinance.

Q: Looking at the model you described where there is a 50% co-share between the LGU and the service provider, what is the cost recovery mechanism for both parties? How do these two entities divide this? And could such a model be used between public agencies at different levels?

A: In the Dumaguete case, they have a provision in the law, which specified how much they can charge. They are charging a little over than USD 0.5/month and they incorporate this into the water bill based on the water consumed. If minimum of water consumed is $10m^3$/month, then the minimum payment for sanitation is approximately USD 0.5/month. Initially the cost of the treatment facility was funded by the local government and the cost of the trucks was funded by the Water Districts. But they combined these costs and came up with an accounting system where they have 50%-50% sharing.

The Water District was the one who spent less initially but they gave the LGU some working capital so both parties had an equivalent co-share. So in the end each party contributed with 12.5 million PHP.

Each have their own accounting system and at the end of the month they merge and divide the net income by the two.

Q: You mentioned that the NSSMP funding is available for very highly urbanised cities (HUCs). I think in these cases there is a potential of economies of scale. So perhaps the cost sharing should focus on less urbanised economies?

A: This was a debate but we concluded that the HUCs were the ones who needed more support. Because of they have higher population density they also generate more wastewater. However, in the amendment that is being proposed they have included other cities, which are not HUCs.

Q: Oxfam has provided a loan. Who is taking this loan? Is it just LGU or any other organisations? And what are they using this loan for?

A: Under the revolving fund they can use the money for the cost of the treatment facility and purchasing equipment. There is a local NGO partner who is managing the funds. Oxfam gave the money to this local NGO as a grant and they loan it to the local government.

Q: You showed six models of septage management. Which models are progressing well and less well?

A: The most successful from my perspective is the Dumaguete model. It has been up since 2007, it has been running smoothly, they have increased they service coverage and actually they are planning to give services to adjoining municipalities.

In response to this question Antoinette added that at a certain point Dumaguete was still charging but no longer were providing scheduled desludging. This happened after a change in leadership. There was less interest from the municipality and also the households thought the service was a bit of a hassle. So households hardly demanded any service. Dave Robbins also added that at the beginning there was really good campaign and 90% of the households were availing the service. However, over the years the city stopped doing the promotion campaign and so people stopped availing the service and 30% did it. When the acceptance of the service became too low, it was no longer viable to provide scheduled services, so they started providing the service on-demand rather than scheduled. In June 2015, Dave found this in a visit and discussed with the local government. Since then they put the scheduled desludging back again. However, they are still behind what they had projected and are not quite living up to what they had planned. This is not just a one shot deal, you have to promote these things in perpetuity. So I believe that Dumaguete will get where they are supposed to be.

Q: Can you tell us a brief history of why in Manila there are many septage treatment facilities and different types of strategies?

A: There are different situations. For example, Baliwag water district for has 100% water coverage and so with that they thought that they though that expanding to sanitation they could increase their revenue, because they don't have much room for that with water anymore. In the case of project 7 it was run by a private sector, one of the concessionaires in metro Manila, so it's private sector driven. They are very efficient (even collection). The case of Bay Laguna, this is run by water district in partnership with local government. They started with a very ambitious plan but now have lowered their expectations. Marikina city was supported by the LGU with the ordinance and other enabling aspects, but again, it was private sector driven.

In metro Manila, initially they put out a tender just for water concession. Sanitation came in much later. Most started with water provision. They went for water first and then sanitation next.

Q: Is there 100% potable water coverage in the Philippines? Is any groundwater being used?

A: Yes in urban areas. Some are using groundwater. In project 7 and Marikina they have both surface water and groundwater, but mostly groundwater. Baliwag also uses groundwater.

Q: The six models you presented are very different. What are the common points among them that explain the success and obstacles too?

A: I think that the common factor for success is the ordinance and efficiency in collection of fees. The common obstacle is willingness to charge. Local governments prefer to focus on more visible investments. Sanitation is not so sexy for them.

Q: You mentioned 5-year cycles for emptying. Are the septic tanks of only one dimension?

A: This cycle is based on the average size. There is a standard in the Philippines (two compartments minimum, two day capacity at the design flow based on the number of users). However, very few people use this standard. Most containment systems don't have bottom and so there is leakage. Pit latrines are very common. The Philippines took verbatim from the US code but no one really took it seriously. Even some engineers are not aware of correct building of septic tanks. Any local government

can decide the timing of desludging based on the needs of their context. The common practice is 3-5 years for cycle of desludging.

Q: Are we talking about real septic tanks?

A: There is a real mix to what people call a septic tank. The NSSMP is trying to raise awareness of correct building of these. In the desludging programs we find all types of containment. Most are emptied using vacuum tanks and smaller vehicle for areas of difficult access. There is no manual emptying in the Philippines and haven't heard about pits collapsing after taking the sludge out. They use concrete rings in pit latrines.

Q: You mentioned that the code is not being followed. It seems that there is a lot of focus on emptying but containment seems to be a problem. Is anyone looking at this? Are there any campaigns?

A: There is a component in the local ordinance passed by the local governments that concerns proper septic tank design. This is always a governance issue. They have sanitary inspectors (SIs), building permits that are supposed to be inspected. But it's a governance issue. It depends on how local governments govern this. The NSSMP framework is now giving the design and standards that each household should comply with and we hope that this will happen overtime. Ideally those not complying will have an opportunity to rebuild the tanks.

Q: In Manila does greywater go to septic tanks or drainage?

A: Only blackwater goes to septic tanks. They use dual pipes here, so greywater doesn't go to the septic tank. So septic tanks actually don't work like they should work. The design timing doesn't work when you don't add greywater. In Bangladesh it's forbidden to connect greywater to the septic tank, but that means it won't work. In the US septic tanks can last between 20 and 30 years when properly managed, so the cost is significantly reduced per year. But if these are not working properly they last less and adds up to cost, because it stops working and needs fixing/rebuilding.

Q: What happens in practice when spillage occurs when transporting the faecal sludge, and is there any legal provision for this?

A: The Department of Health has very strict regulations on this, including a manual. Tanks should have proper signage, and operate at certain times.

Q: Do you have proper desludging disposal?

A: There are different models. In Dumaguette city they have a drying bed and give the end product to farmers. Others they have to take it out to outside Manila. Probably 90% don't have proper treatment. But you'll be able to see the models that work and that have proper treatment and that hopefully through the NSSMP will be replicated.

3.2 Reports from field assignment

Each group presented on their field assignment.

3.2.1 Group A: Baliwag Water District

Background: Baliwag Water District (BWD) is a government owned and controlled corporation since 1 July 1989. It is located 52 Kms from metro Manila in Bulacan province, and serves a population of 160,000 people. Their vision is to "to be a world class water utility providing excellent service and protecting the environment in partnership with the community", and their mission is to "provide safe, adequate and affordable water and sanitation services and protect the environment through community participation".

A number of drivers contributed to the development of Baliwag septage management. These included concerns with groundwater contamination, and the fact that the water district was a progressive and economic viable utility. The following provided the legal base for the development of Baliwag' s septage management:

- Presidential Decree No. 198 - Water Districts are mandated to provide water and wastewater facilities in their jurisdiction
- Philippine Clean Water Act - Prohibits discharging, injecting or allowing to zip into the earth any substance that will pollute groundwater. Serves as the basis for the National Sewerage and Septage Management Program
- Supreme Court Mandamus - Mandating all provinces around the Manila Bay to implement programs that will clean up, rehabilitate and preserve the Manila Bay
- Local Ordinance No. 016 S. 2010 – mandates comprehensive septage management in Baliwag, Bulacan.

In addition to this, BWD has a memorandum of understanding (MoU) with the LGU where it is established that the operation of the septage management programme is the sole responsibility of BWD. The role of the LGU concerns the passing of the local ordinance which mandates the septage management programme and has penalty provisions for non-compliant households.

BWD owns and oversees the operation of the treatment facility and desludging but outsources the actual operation of these to a private company.

Operation and maintenance aspects:

- Scheduled desludging. Septage collection cycle of 5 years. Municipalities are grouped into 5 zones. One zone per year is desludged.
- They have 2 vacuum tankers and a mini-dump truck to transport the sludge for final disposal. The 2 trucks do 3 trips/day
- The treatment facility has 30m^3/day capacity. It is fully mechanised. This includes an accredited laboratory for process control monitoring

- Has a BWD pollution control officer who inspects the quality of the contractor's work (at desludging and at the plant). His role includes doing surprise checks, sampling at each stage of the plant operation, and accompanying the desludging operations twice a week. In case of non-compliance by the contractor according to the ToR, he writes complaint letters to the private company
- A GPS system is used to monitor the activity of the desludging trucks as a way of monitoring the performance of the private company
- The treated sludge is disposed as earth filler and agriculture, although most of the sludge has been used by one farmer who does vermi composting. Reuses the liquid for cleaning and landscaping
- The regulator does not regularly check compliance by BWD, they only rely on quality reports
- They are planning to provide information on septic tanks to local government to enforce regulations on construction of septic tanks. There is a risk of creating negative community perception towards them

Financial arrangement:

- The project was financed through loan, which required land acquisition
- Land Acquisition was financed by the BWD through its internal cash generation
- The local ordinance establishes that the local government should buy the land but BWD bought the land because they didn't want to be influenced by the local government. They wanted to be completely independent
- They are still paying the loan but have paid more than half of this
- Estimated return on investment of 7 years
- Septage fee is bundled to the water rate (10%)
- Septage treatment is ring-fenced from the water supply

Success factors:

- High level commitment from top management
- Investment in new technologies
    - Minimum land requirement
    - Highly mechanized process, which reduces need of labour and minimized contact with sludge, and is cost effective
- Stakeholder focus – worked to develop good a relationship with the community and the local government. BWD conducted a public information campaign to 27 Barangays of Baliwag. When started project they had good relations with the mayor and the new mayor that came after was also supportive. They emphasise to the community that local government is their partner
- Close control and monitoring of the private sector company performance
- Land suitable for agriculture production
- Cost recovery model
    - Investment through bank loan – 7% 10 years USD 1.5 million
    - 10% levy on the water bills
- Annual contract with fixed fee paid by the private sector (rate for collection-treatment)

Recommendation: Immediate attention is needed to closing the sanitation loop. More attention is needed to the containment (poorly designed septic tanks) and reuse/disposal components of the sanitation value chain. Need interventions for proper treatment and reuse/disposal of bio solids.

Q&A:

Q: You mentioned that some people are overpaying for the service? Can you explain this please?

A: That's just a qualification. They are not overpaying, it's just that they are not aware they are paying for the service. Although some people might feel they are overpaying because within the 5-year cycle their septic tank might not be full.

Q: You mentioned there was high involvement of top management. Did that also include the municipality? What's your ideal involvement of the municipality?

A: The top management involvement related to BWD manager. He has put it on his agenda as top priority. We could see that as soon as we got in his office. They didn't really want to involve the LGU much. They bought the land as they wanted to keep the control within the utility and avoid political disturbances.

Q: How do they monitor the service? Who is responsible for it?

A: They have a lot of staff in the utility doing monitoring and controlling the PS/contractor

Q: What's the actual role of the PS?

A: The utility outsourced everything to the PS and pay them a fixed monthly fee. They are monitored very closely. It's a very low risk business model. They know what's coming in. They know what they are paying. And top management is willing to do the work and monitor. It's a smart model.

Q: Has the LGU implemented the local ordinance?

A: Yes. The LGU has facilitated with issuing the licences.

Q: Philippines is a very diverse society. How does this business addresses the needs of the poor?

A: They didn't clearly explain how the poor are served. They are only serving water users, that is, only metered households and non-metered households.

Q: What are some of the challenges of this business model?

A: The MoU between the LGU and BWD and also ToR between BWD and PS. They seem to be a good example/model to consider. BWD has a stable income and a stable expense. The issue is that they are only taking care of the water consumers.

2.2.2 Group B: Project 7, Maynilad Water Services Company

Background: Maynilad Water Services (MWS) was formed in 1997. Before this service provision was under Metropolitan Waterworks and Sewerage System. After 1997 Maynilad Water Services was granted a 25-year exclusive concession by the Philippine Government to operate, maintain and invest in the water and sewerage systems in the cities of Manila. This concession had been revised and extended 15 years more. The goal of the company is to improve the health and sanitation conditions through environmental preservation. This goal is aligned and supported by the following legal documents:

- Republic Act No. 9275 Clean Water Act-2004
- Supreme Court Decision *(18 Dec 2008)* to clean up & rehabilitate Manila Bay

Basic services offered by the company include: sewerage service connections, septic emptying, sewerage and septage treatment, and network maintenance.

Market share of the services: Manila has 12 million people, of which 11% are served by sewerage system and 89% are not-sewered (predominately septic tanks). Of these 89%, 30% of which are served by a scheduled desludging scheme, and 70% are served by an on-demand desludging program. It is assumed that 100% of the population of Manila has access to clean water.

Financial arrangements: In 1997 the company received money from World Bank (50 million PHP), and this was used for their initial investment into operations and maintenance. They started with 1 truck and currently have total capacity of 540,000 m^3/day for sewerage with more than 522 km of sewer line, 4 mobile desludging units, and 48 exhauster units for the non-sewered customers.

Different types of customers are charged differently:

- Sewered domestic customers are charged 20% of the basic water charge
- Sewered commercial costumers are charged 40% of the basic water charge
- Non-sewered Customers (Domestic, Commercial, Industrial) are charged 20% of the basic water charge (this is for scheduled desludging)

Planned/Scheduled Desludging is available for domestic customers. This occurs in cycles of 5 years. There is no additional fee for domestic customers who don't avail the service. However, if they call for emergency emptying then they have to pay separately an extra charge. This is the same fee for the on-demand service.

The emptying service from the company's perspective: Community briefings are conducted on a regular basis and leaflets are provided. If a household refuses to desludge its septic tank or even refuse to install one, it signs a waiver releasing Maynilad from any responsibility Main reasons for households not to desludge include: the household cannot locate the septic tank, the household cannot decide if they want to desludge; the household is not interested; the household doesn't have a septic tank. Maynilad inform the community leader of cases of households who don't desludge, so there can be a follow up on that person's case. However, the septic tank stands on private property so Maynilad has no power over it. Some people resort to illegal emptiers because the service they provide is cheaper; these practice illegal dumping.

The emptying service from the customer's perspective (Carmen, a 71-year-old lady who has not emptied her septic tank in the last 5 years): When Carmen's toilet and shower drain got clogged, she decided to call on the desludging services. Carmen was aware that she paid a fee on top of her water bill

that entitled her to the service for free. She had not joined the regular desludging programme because she was not aware of it and she also felt that it was not that important. She inquired her neighbours and then she calls the number referred in the water bill, for the desludging service. Manylad came in 24 hours and she thought they were fast and professional. Further, recently, she observed a desludging process of a neighbour and she felt it was fast and efficient. Unfortunately, she said, during the renovation of her house, she covered the manhole with a concrete slab.

Operational Health & Safety: The company has operational health & safety procedures in place. These include safety equipment for the staff both at the plant and during the delivery of desludging services. Staff receives training annually on these procedures. There's a fleet maintenance team in place. If a truck breaks down the sludge is not transferred on site but the truck is fixed or towed by this team. Further, staff reports satisfaction with operational health and safety procedures. Some challenges were reported however. Due to the hot climate, staff sometimes does not fully comply with safety equipment. Observation conducted by the group both at the plant and at the desludging site confirmed partial use of safety & health equipment.

Challenges:

- According to the Head of Septage Management, the main challenge was acceptance to desludging by households. About 70% of the households still resist desludging, particularly on on-demand areas. Although acceptance has grown over time, this has not been significant and it depends on the area.
- Worsening of traffic
- Narrow streets and difficult access to households
- Transport of bio solids
- Limited access of info on the number and conditions of septic tanks

Recommendations from the group:

- Increase awareness of population to promote acceptance of the desludging service
- Continue to work with City Authorities to develop and implement a septage management ordinance
- Improve control of health and safety standards
- Strive to have as many customers as possible under the regular desludging service

Q&A:

Q: Is the emptying and transport done by MWS or outsourced? What's basis? Fixed or volume?

A: MWD is the private sector concessionaire. They are doing sewer and septage management. They are only outsourcing the transporting of the bio solids for disposal. The rest they are doing it themselves.

Q: How much do they charge?

A: For using septic tanks they charge 20% on top of the water bill. The water bill is 30 PHP/1000L water. This is for all types of residential buildings.

Q: How is the regular desludging done?

A: 30% of the households are under the regular desludging program. Desludging is done in a cycle of 5 yrs. If the customer wants an additional emptying service outside of the desludging cycle they have to pay an extra fee, in addition to what they pay bundled with the water bill, which is 20% of the water bill.

Q: Manila water has the same problem of lack of an ordinance. What are the issues of this in the case of Manylad?

A: There are mechanisms to enforce which encourages no compliance. Households who don't avail the service have to sign a waiver and there is nothing more MWS can do about it. However they are working with the municipality to develop an ordinance so they can enforce.

2.2.4 Group C: Bay, Laguna septage treatment plant

Introduction: Bay, Laguna is a municipality on the Southern shore of Laguna de Bay. Laguna de Bay is an important source of drinking water for Manila and surroundings, and it is therefore essential to avoid contamination from insufficient septage management. What stands out in this situation is that this municipality plans to organize their septage management as a public-private partnership (PPP) between Envirokonsult and Laguna Water District (LWD).

Envirokonsult is a private company owned by Anthony Gedang, who is a passionate environmentalist. Envirokonsult supplies vacuum trucks and operates a pilot septage treatment plant in Bay. This treatment plant includes solid water removal, dewatering and secondary treatment. It is fully automated, ensuring no human contact with the sludge. After dewatering, the dry bio solids are used in vermiculture so that it can be reused as a fertilizer.

LWD is the body responsible for the septage management in the municipality. They currently do not have the capacity to operate their septage management plan. For this reason they will outsource the operation of emptying and treatment to Envirokonsult.

Current situation: About 58% of potential drinking water sources are contaminated with coliform. This is why septage management is necessary and LWD wants to achieve their responsibility. However, at the moment the partnership is not yet achieving results.

The National Building Code states that every household should have a good working septic tank. Currently, the engineering office of the local government is checking the septic tank of all new houses before the house is delivered. However, it is not clear how many old houses have a proper septic tank and the checking of those septic tanks is lacking behind. The Clean Water Act of 2003 states that every

septic tank should be emptied every 3-5 years. At the moment, servicing of the commercial and new housing areas is done by LWD, who charge according to a scheme. About 500 customers are currently making use of this service. The leftover part of households is serviced by informal emptiers ('malabanan'), who charge a lot and are only contacted for emergency emptying.

The fertilizer is currently being tested in the bonsai garden of Envirokonsult, and is not allowed to be sold officially yet (as it has to be certified then). However, the surrounding plant nurseries do buy the fertilizer that is

Partnership: LWD has a service contract with Envirokonsult. The role of Envirokonsult is to do operation and treatment, while the role of the LWD is to have the final responsibility of septage management. Furthermore, the vacuum truck equipment and treatment plant is delivered by Envirokonsult. The inclusion of a private company in the transport and treatment of septage has slowly been accepted by the public. The trust of the public has been gained through public hearings and consultation, getting the ordinance, and education and awareness raising. The only role of the municipality was to give the ordinance and hold public hearings.

The financing of the septic emptying is 2,5 PHP/m^3 of water consumed, which is a 10% of the water bill.

Challenges:

- The Local Water Utility Authority (LWUA) has not yet passed the 2,5 PHP/m^3 tariff on the water bill. Due to this, the implementation has been delayed.
- There is a discrepancy of knowledge on what percentage of the septic tanks in Bay is up to standards. Particularly in old houses the state of septic tanks is unclear.
- Acceptance of the public for adding the charge to the water bill. It has taken a long time for the community to accept the 2,50 PHP.
- The contract of Envirokonsult is only 5 years, but the breakeven point for Envirokonsult is 7 years. This is a risk for Envirokonsult.
- The limited involvement of the municipality. The municipality does not have a clear vision for their septage management, and is not involved anymore since it has completed its task.

Opportunities:

- The owner of Envirokonsult is very passionate about environmentalism, which is a strong driver for pursuing the goals and delivering result, even if it takes a long time.
- The municipality of Bay was the first municipality to give ordinance to Envirokonsult. They can be an example to the larger municipalities around them. The cooperation of the municipality in giving the ordinance has been part of the reason why it works.
- The treatment plant is very mobile and needs little land. It is therefore quite resilient to changes.
- After the initial contract, it is possible for the LWD to buy the treatment plant and operate it themselves, if they have built enough capacity by then.

Conclusion: Bay municipality in Laguna is ahead of its neighbouring municipalities in supplying ordinance to the private sector partner. The next step now is implementation of the partnership and start operations. Hopefully the de-sludging model of Bay municipality can serve as an example and inspiration to surrounding municipalities.

Q&A:

Q: Did you check if the leader of Envirokonsult is interested in investing in other places? What is the reason behind his passion?

A: He is in a relatively comfortable situation. If things don't work out in the future, his plant is built in container blocks. He can lift it up and move it and he has done that before and he can use the land for something else. He is focusing on this plant first because he wants to make the business model successful first. He says he has an environmentalist who is representing the country at environmental conferences. He chose Bay, Laguna because it's one of the main sources of water to Manila. He has been working with Laguna cleaning rescue before so he is not new to this space. Local authorities opened for bidding and he was the only one applying.

Q: There seemed conflicting in figures on septic tank coverage? Who to trust?

A: This actually indicates there is a communication gap, or unreliable data collection, which needs to be addressed. It could be thought that it's 80-90% with septic tanks and that 50% are will designed. Building of septic tanks according to standard is supposed to be enforced but implementation is a challenge. There is a design standard but this is not really followed.

2.2.3 Group D: Marikina City

Introduction: Marikina city has 500,000 people and it's very vulnerable to flooding with approximately 3 flooding events per year. It also has a problem of squatter areas. Manila Water (MW) is the concessionaire for east zone of metro Manila. MW took over water service provision in 1997. At the time only 26% of the households were connected to water supply, and only 3% had access to septage treatment, with only 1 septage collection truck. The challenge back then was very low coverage and inaccessibility to septic tanks, inefficient services, and lack of community support. The rivers in this area were biologically dead, which had public health consequences.

MW covers 23 cities and municipalities, including major business centres. It spans 1,400 km^2 and serves 6.2 million customers.

How does the system function? As an initiative to raise awareness, initially the Local Government Unit carried out a knowledge surveys, distributed leaflets, and displayed drawings of correct septic tank design. This led to change in the knowledge from 20% to 80% on awareness of the desludging process. The local government also tapped into people's love for the river as a motivation for them to carry desludging. Further, they passed a local ordinance and enforced it. According to this it is mandatory to desludge every 5 years. There is a monitoring system where households are checked and sent a warn-citation ticket if they haven't desludged. If household fails to desludge after this, then there is a fine (maximum fine: 5,000 PHP) and if all of this fails they can go to jail. Households who desludge receive a card indicating they have done so to put on the outside wall of their houses.

They promote the service as "free" desludging service. However, the households actually pay for this in their water bills (20% of the water bill).

After MW took over the service there was an increase in coverage. They upgraded the community septic tanks and the sewerage treatment plant. They had 1 treatment plant and now have 37 treatment plants. They also grew from 1 desludger tank to about 110 currently.

The bio solids are taken to Lahar area in the north (volcano affected barren land).

Compliance for desludging is 90% for Marikina City, and 50% for the rest of the east zone.

Key strategies of MW - *'Cooperation, relationship, decentralisation and customer satisfaction'*:

- Good working relationship with the local government unit - worked together in building a conducive environment for doing business with a strong social focus on drawing up of the sanitation ordinance
- Devolved the one central business into eight more business units zones that brings senior managers to see the day to day of customer needs
- A lot of emphasis on awareness raising campaigns, including dialogue with customers and taking them on tour visits. This was critical all to achieve community support
- Communal septic tanks and septage management and combined sewer and drainage system. Septic tanks were upgraded accordingly

What are the challenges for MW?

- Social
  - Squatters live in dwellings of 20m^2 in relocated settlements in the city. This is not enough space to build septic tanks according to standard. Planning to build communal septic tanks
  - Solid waste dumping leads to high cost of interceptor cleaning. Needs further community campaigns
- Technical
  - Lack of knowledge on type of containment (sizes and structure not known), so need for desludging is often not known. Need to conduct a census
  - Some households have tanks where the bottom is not sealed. MW cannot do much. A solution could be condition of upgrading if household put application for renovation
  - Inaccessibility to septic tanks
  - Replacement of spare parts in septage treatment plant Manila Water makes maintenance difficult
- Financial
  - They don't have separate analysis of cost of sanitation (water supply and sanitation costs combined). This means that in future investments they don't know the real cost of sanitation and if it's being subsidised by water
- Health
  - Open drainage of overflow from septic tanks from house into street
- Regulation
  - No ordinance and therefore poor compliance albeit "free" services in cities other than Marikina

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Q&A:

Q: You mentioned that people who don't comply may end up in jail but there is no ordinance in place? How does this work?

A: Marikina has an ordinance but the rest of the cities don't.

Q: Are the serving the squatters? (In Indonesia utilities cannot serve squatters according to regulation)

A: Squatters have been relocated and so now they live new settlements and not in slums.

Q: You mentioned the settlers use community septic tanks. Who provides the land for that?

A: The land has been allocated government. It's government land. The septic tanks serve more than 1 household. Funding is still being sought though. The program is not covering the settlers at the

moment. We assume that once communal sceptics are ready they'll figure out a business model for that.

3.3 Concluding reflections by Dave Robbins

Dave Robbins made some concluding comments in relation to some of the points discussed in the presentations:

- **PS involvement in Bay, Laguna:** the owner of Envirokonsult thought all 4 municipalities would get the ordinance. He is a typical businessman, motivated by profit too. He is also a dealer of the treatment equipment. So also could interested in having the facility as a model to showcase. The model of a private sector taking over this role is very attractive and can really be something that can be replicated, especially if done in conjunction with the passing of local ordinances. Then it becomes very attractive for local PS to invest.
- **O&H procedures:** Manylad opens the septic tanks. A better model might be to have the households do it themselves. This avoids liability issues.
- **Regulating and monitoring of the PS:** in Manila Water trucks all have GPS monitoring. The treatment plant has automated receiving stations. From a compliance point of view they know exactly where their trucks are. This enables better checks.
- **Financial recovery on investment:** The 2 Manila water utilities are guaranteed their rate of return. They charge 20% of the water bill for sewer and septage. Even if you are not connected to the sewer you still pay. This in theory will cover the expansion of the sewer.
- **The role of the central government:** In the Philippines there is decentralized power mostly, also for sanitation. NSSMP is active since 2012. This provides cost-share to local governments to build sewerage systems and septage management programs, but for 3 years no municipality availed this.

3.4 Takeaway learnings

Country groups were invited to reflect on the takeaway learnings from the field visit presentations that were relevant to their countries, and present these to the rest of the participants. The table below provides a summary of these.

Country	Takeaway learnings
Nepal	• Law enforcement is needed for building septic tanks to households. In places where there is sewer line government should charge with the water bill • In some cases it's better to engage PS to operate the treatment by supporting them (e.g. providing some land and providing them with some technical support). Can also try to engage investors to give them a loan with low interest rate • In Nepal there are lots of slum areas but no public toilets. Government has to relocate these people from the river banks firstly

Country	Takeaway learnings
	• Manilad's awareness raising campaign with communities is a good example. There is a needed for this in Nepal • There is lack of technical guidelines in Nepal. Capacity building for central and LG is very important
Bhutan	• Saw some of good examples of outsourcing to PS, which can be a way of ensuring effectiveness of services • At the moment in Bhutan, government is responsible for septage management. It would be good to consider engaging NGOs or PS • In Bhutan we're short of legal provisions like the local ordinance for sludge management in the Philippines
Bangladesh	• Learned about new equipment and technology. Saw some good examples of separation of bio solids at the treatment plant, where dewatering is very quick. In Bangladesh it takes a lot of time because it's not mechanised as we saw here • Learned about some business models which can be replicable. The private-public partnership is a very good idea. Outsourcing can be a way to make the system more affordable, sustainable and profitable • Use of GPS to monitor the desludging process by the PS • Importance of raising awareness amongst communities
Indonesia	• Importance of clarifying responsibilities between the national and the local governments. In the Philippines the PPP arrangements were with the LG • The importance of enforcement of regulation • Profitability of some of the businesses models we saw
Mali	• Ownership of the LG of sewerage management • Sustainable mechanisms of invoicing • Role of the PS • Setting up a standardization system of pits • Importance of local ordinance • Revaluation/re-use of the sanitized sludge in agriculture through composting or production of biogas
Kenya	• Enabling role of LG in regulation and enforcement • How the government has provided incentives for local governments to invest in septage management • Enabling policies and the crucial role of the PS

Country	Takeaway learnings
	• Importance of communication and ensuring a common objective in partnerships • Importance of involving the community • The need to prioritise low income households • The possibility of combining on and off site services and making businesses from reuse of sludge
Zambia	• A focus on low income people seemed to be missing generally • Participation of the PS – this is missing in Zambia • Well-established level of regulatory enforcement. This is weaker in Zambia
Zimbabwe	• Informal settlements need to be formalised and provided with services • The importance of creating awareness for payment so that there is willingness to pay

3 BLOCK 3: OPERATIONAL HEALTH AND SAFETY IN REAL LIFE

OVERVIEW OF BLOCK 3: OPERATIONAL HEALTH AND SAFETY IN REAL LIFE

Why is this relevant?

So far little attention has been given to operational health and safety, which is surprising because of the risks involved. Ultimately we want to see protection of human health and the environment. If workers are in contact with sludge, or if a truck leaks on its way to the treatment, those objectives of human health and environment are affected. There are multiple aspects of health and safety, such as:

- Whether or not emptying method requires that someone enters into the pit
- Whether the process results in spilling or leaking of sludge in the neighbourhood
- Whether the workers use protective gear
- Whether the workers are knowledgeable about risks
- Whether there is a safety protocol in case something goes wrong (spillage or an accident during transport)

What were the knowledge and learning outcomes intended from this block?

- Understand the multiple dimensions of OH&S risks
- Gain new ideas of approaches to address OH&S risks

What was the process?

1. Introduction to the topic of OH&S (block 3)
2. Presentation by WSUP on the OH&S aspects of their FSM program
3. Presentation by SNV Bangladesh on the OH&S aspects of their FSM program

This block also included a presentation by ADB on their strategies, programs and approaches to sanitation.

3.5 Introduction to Block 3, summary of D-group discussion on this point

Presentation by Antoinette Kome, learning event facilitator

Antoinette started this presentation by providing a brief overview of the D-group discussion on the topic of "OH&S of emptying and transport". The following points summarise this:

- The biggest risk is illegality. If emptying happens illegally then all OH&S procedures are disregarded
- Although in Southeast Asia manual emptying doesn't happen as much, there are cases where people go inside the pit and these collapse
- Other types of accidents include people dying from breathing poisonous gas
- Repetitive events can no longer be called an "accident" however
- Another common problem of manual emptying is alcoholism
- The actual problem is not manual emptying as such but the lack of enforcement of building codes. This is an area of big neglect. The Philippines is doing very well in emptying services but not so well on ensuring that containment facilities are built according to standards
- There is a challenge in conveying this issue to the public and the government. If there is no injury then people don't see the long-term risk

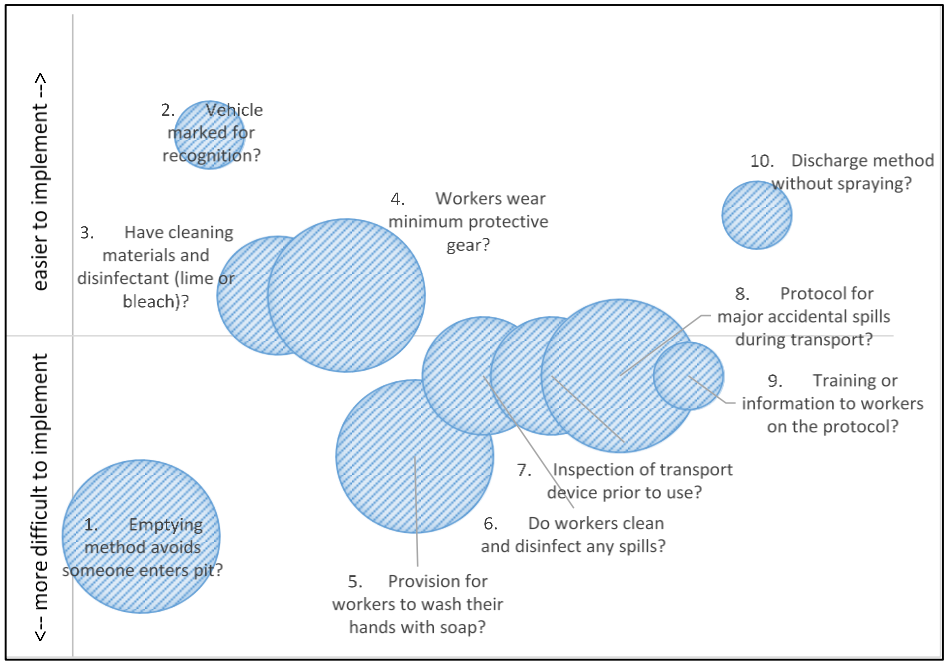
It was emphasised the importance of thinking beyond personal protective equipment and think of OH&S risks along the sanitation value chain: *"OH&S is more then boots and helmets. It's beyond personal protective equipment."* As an example she noted that observed cases of children playing barefoot during and around the pit emptying process are an OH&S issue, particularly if there is any spillage.

Typical OH&S along the sanitation chain:

User inter-face	Containment	Emptying	Transport	(Transfer stations)	Disposal	Treat-ment/ re-use
	Seepage Overflowing containment Unlined/ unstable pits	Collapsing pits Entering/ falling in pits Inhaling poisonous gas Explosions Spilling while transferring transport device Use of kerosene Working without shoes, or any gear Removing solid waste from the pit Removing rags/ rubbish from hoses without bare hands Limited personal hygiene practice	Spilling Leaking valves An accident	Leaking transfer stations Improper use	Disposal on-site or unsafe dumping elsewhere Spraying when discharging from the hose Manual raking and cleaning screens	

To address these risks we first need to eliminate or reduce the risk and second to try and contain or manage the risk. However, without viable effective services, it is hard to sustain OH&S.

There are different measures we can take to improve OH&S. Some these measures are easier to implement than others however (see figure below). For example, it is very hard but very important avoid having people entering pits.



Antoinette also highlighted a point made in the D-group discussion that before trying to educate people about a certain OH&S risk, we need to first look at the model and see if there is any opportunity to prevent that same risk to happen by organizing the model differently. The question of who will pay for the cost of OH&S measures was also raised.

The presentation was concluded by pointing out areas of where progress in this area is being made and key considerations (from the Dgroup discussion):

- Nakuru, in Kenya is working on OH&S Standards
- In Bangladesh and Indonesia (at the national level) there are standard operation procedures which provide some general ideas on health and safety
- Information and awareness raising should come before inspections and penalties
- All stakeholders should be involved, not only the workers
- Provision of enabling facilities and equipment is essential. For example the desludging vehicle should be marked for that it is a septage truck, making sure a cleaning kit is available and that workers wear a mask
- Emptiers associations should can conduct self-monitoring as a pathway to certification and more professional services

3.6 Presentations on OH&S

3.6.1 WSUP Zambia

Presentation by Reuben Sipuma, Country Programme Manager, WSUP Zambia

Introduction: In Zambia the Ministry of Local Government and Housing is responsible for coordination and resource mobilization, and through the local authorities they are responsible for provision of water and sanitation services. The local authorities are mandated through the act to form a water utility/company who then provides the services on their behalf.

Lusaka Water is the partner WSUP is working with. WSUP works with service providers to help them improve services to the low-income groups – WSUP's focus.

Lusaka Water and Sewerage (LWSC) was established in 1988. It is fully owned by Lusaka Water and operates under a license issued by the national regulator whose responsibility is to ensure that safe water and sanitation services to the people of Lusaka is maintained including in peri-urban areas (in Kenya would be more slums).

The population of Lusaka 2.1 million people officially, as it is estimated it's close to 3 million. Out of this the 2.1 million, 65% live in low-income areas. That's why WSUP and LWSC emphasis is on pit latrines as opposed to septic tanks. About 15% of the population is served by sewer system, and 5% have access to decentralised sanitation (peri-urban areas). The majority of the remaining (about 90%) of the 65% have pit latrines.

Lusaka is a flat laying area and the water table is relatively high. The rate of water born diseases and risk of contamination is high.

Development of the FSM model: Before WSUP and LWSC started implement the FSM model, it did a market assessment. It looked at the existing solid waste and liquid waste management models. It also looked at people doing businesses in informal settlements. It found that there were informal services being provided at night with illegal dumping. The assessment also included looking at the by-products and their value. It looked at what was available in the market and found that the use of charcoal and manure were very common, as well as compost. So there was already a good market for these products. WSUP then considered which of the various players within the sanitation value chain were going to do what and how.

In developing the model, WSUP and LWSC developed a vision: "an effective business model and a service which customers want".

Further to this a financial analysis of different options was undertaken. One of the questions was how to transport sludge (50L or 200L drums?) and chose a model that was close to what was available on the ground.

Field trials were also conducted. It included working with the illegal pit emptier. Through this process WSUP and LWSC found that transport was a key challenge for them. Because they didn't have transport and treatment option they would dump the waste inappropriately. Different types of transport were tested (push cart on small wheels, push cart on larger wheels). The smaller wheels'

version was chosen as this as easier to push. Emptying solutions were also tested and developed new tools (e.g. scooper, the crocodile, etc.).

Following the field trials the service levels were set. In response to a general low willingness to pay for sanitation services in Zambia, 3 options were provided with different container sizes. This was aimed at encourage a culture of payment.

The service provision teams were professionalised and given a name ("dream team"; "miracle team"; "the real team") and marketing of the end product was undertaken at within the community and at the agriculture and commercial show.

WSUP also had to think about how to collect the data. A customer data sheet was developed. This included the location of the customer, emptying record, distance to transfer stations (2 kms), etc.

The financial analysis estimated that if each team could serve 60 customers/month they could break even.

Lessons learned/concluding notes:

- Solid waste collection services and improved toilet usage will reduce the cost of FSM services
- Toilet owners will 'climb' the sanitation ladder if they have access to affordable, professional and reliable services are available
- Research is necessary to address the gap in O&M of transfer stations
- After 2 years of implementing model, although it has not broken even, there are indicators that it can
- WSUP has been able to influence the sector FSM has been enshrined in the urban sanitation policy
- For more information see practice note in WSUP's website

Q&A:

Q: OH&S is the topic of this session, am I right? I didn't see much OH&S in the presentation.

A: When we talk about OH&S it has much to do with how desludging is organized, and whether we can organize it in such a way that risks as avoided. We asked WSUP to present because they innovated the organization of emptying services (response by Antoinette).

Q: How is the control of flies in the processes of collecting and transferring faecal matter to the drying beds done?

A: Initially we had people doing the business in a very informal way. So health issues are not completely addressed yet but these have improved a lot. The containers are closed but initially the emptiers would just dig a hole on the side and dump the sludge in there. Now we have a bio digester (transfer station) and a drying bed, and the sludge is taken there in closed containers. So the issue of flies has been reduced. Once the emptiers finish working on a household they disinfect the area they worked on.

Q: What are the chances of excessive spillage? We have issues with the gulper in Kenya. Also what stakeholders have you involved to regularise this practice and how have you involved them? How do you approach the Public Health and Environmental Departments to get their buy-in?

A: Concerning stakeholder involvement, Lusaka Water and Sewerage Company has a mandate order of providing services through delegated management, that is, community based schemes. From the design perspective the Zambian Environmental Authority is the regulator. We did secure the environmental project brief that allowed us do the construction, ensuring the technology has minimal chances of causing environmental pollution.

Concerning the gulper, before we thought we could use the gulper but we had a challenge with solid waste in the pit, which are not standardized. So we opted to engaged the manual pit emptiers and developed different types of tools to make it easy to empty the pit. The area is water logged and the toilets are above ground level, which make it easier for emptying.

The initial practice was that pits would fill up and subsequently abandoned, and then there were no space to build more, which increases open defecation. Lusaka Water realised about this problem. So when WSUP approached Lusaka Water, they thought they could be at the initial stage in moving up the sanitation ladder.

In terms of OH&S, Lusaka Water has an off-site waste treatment plant, so they tried to get a copy of what's happening on the ground, and give the manual emptiers medical checks, and other practices they carry out at the waste treatment plants.

Q: What were your findings in the market assessments, regarding the willingness to pay for the services?

A: When we did the evaluation, it came clear that communities were saying that there was no system for emptying, transporting and disposing. Willingness to pay in Lusaka is always there as long as the service is reliable. What have been lacking are the services. The challenge now is how to improve established service so the willingness to pay can continue. Our approach was to respond to the challenges one by one. You can't sort out all challenges at once otherwise we wouldn't have started. The challenge now is the financial sustainability and continuing on improving OH&S.

Q: With the use of the pushcart, how do you access narrow streets? And regarding the charcoal, what was the acceptance by the community?

A: Initially we thought we could use a motorcycle but realised that with the pushcart, the way it's designed, we were able to manoeuvre better. We're able to use the pushcart in settlements; there are no issues of pushcarts in there in our case.

Regarding the charcoal, we did a testing of the sludge, to try and find out at what stage it could be either sold or disposed, that is how long it has to stay in the drying beds. If it stays 5 weeks in covered drying beds, all pathogens are killed, and so at this stage we can sell the sludge. The biggest target is the farmers. The communities are not really open to using this product as they know its their own excreta.

Q: In your market assessment of the by-products, what difference did you find between the different by-products and how these are paying back?

A: When we started developing the model, we thought about biogas and sludge, however we realised the volume of biogas was not enough to sell it, a lot of it evaporates during the process (you're dealing with sludge that is in containment for 5 years). With the sludge, we knew there was market for manure, purely for landscaping. The challenge we have now is the market aspect of our business models, which is not working to sell as much as we generate from the bio solids. We tried to tap into what people were already using and charcoal mostly used, particularly in low-income communities.

3.6.2 SNV Bangladesh

Presentation by Rajeev Munankami, Senior Advisor/FSM Programme Leader, SNV Bangladesh

SNV Bangladesh has a large program on FSM in one large town (Khulna) and in two smaller towns (Kushtia and Jhenaidah) in Southern Bangladesh. This presentation focuses on the OH&S aspects of this program. The FSM program in these towns started in 2014 and it is looking at the entire sanitation value chain to close the sanitation loop.

Concerning OH&S, there key aspects to highlight:

- Unless we have healthy emptiers, the sanitation service won't be sustainable.
- To prevent accidents there is a need to address a lack of awareness and practice of safety (this applies to the South Asian region in general).
- When looking at transportation system it needs to be safe. In Bangladesh transportation of septage has not been recognised in any special category of transport.
- In the reuse of bio solids, it's important to ensure that trace elements are eliminated.

Overall, when looking OH&S we need to look at different nodes of the value chain and see were OH&S risks can be reduced, by making the processes safe and minimising human contact with the faeces. Some of the risks across the chain are for example:

- Containment - we can target behaviour change regarding the type of toilet used: *"With a little bit of awareness raising we can solve some issues".*
- Emptying - for example, WSUP and Practical Action has been developing and testing different mechanic devices for emptying. SNV is looking into drawing on these to use their program. In this part of the chain there are also issues related to the use of Kerosene, not using protective equipment, and smoking during the emptying.
- Transportation - there can be leakages, and this is a broader problem of the overall transportation system (e.g. leakages from the tanks and the pipes). However a small leak from a vacuum truck is completely different from other types of leakages in the broader public commuting system. There is no special protocol on how to deal with this type of spillages.

- Disposal - there are issues such illegal dumping issues.

In Bangladesh, in the last 10 months, 31 emptiers have died while emptying pits. Looking from a national perspective, there are OH&S policies but these are not translated into practice. This is due to different reasons:

- Limited coordination between departments
- Workers are not willing to adopt good practices because their level of awareness is low: "People don't feel like using equipment such as boots, gloves, etc … they say its too hot or 'I can't feel things when I wear gloves"). Isolated innervations are needed to deal with the different nodes of the chain. For example at the emptying stage, the service receiver should not pressure the emptiers to go inside the pit.

Bangladesh has done very well in reducing ODF. Now it is in the 2nd generation stage of FSM. This is still poorly regulated and unplanned. Unsafe practices still prevail. For example, the use of kerosene to deal with bad smells. There are also cases where the emptier has boots and gloves but house owner who is present at the desludging process doesn't. There is also a difference on what is found in surprise visits and scheduled visits. There were cases where people gave away that safe practices were not really being undertaken as the helmets still had the price tag on. There are also cases where all is done well but the sludge is disposed into water bodies.

Given this situation, SNV started working with the policy support unit under the Ministry of local government, and developed a ToR with them (it was quite an exercise to identify an OH&S expert to develop a guideline for FSM. Expertise available was more related to other sectors such as industrial occupation, automobile, etc). SNV worked together with the OH&S expert to conduct field observations of the emptying processes (mechanical and manual), documenting this process. Based on this SNV produced guidelines for OH&S and published a training manual. SNV will be conducting training.

However, a challenge remains: *"It's really difficult to teach new tricks to old horses".* Nevertheless we have seen some changes.

In a nutshell, OH&S needs to be address from different angles looking at the different nodes of the sanitation value chain. However a first step to move forward is to focus on immediate awareness raising campaigns.

Rajeev finalised the presentation by acknowledging SNV Bangladesh partners in the FSM program: Khulna City corporation, Jhenaidah and Khushtia Paurashavas, Khulna University of Engineering and Technology, Water Aid, Bill & Melinda Gates Foundation.

Q&A:

Q: You mentioned that the 31 emptiers died in a period of 10 months. Was it purely related to sludge or are there other reasons that could be involved?

A: These are reported cases that clearly said that these people died when emptying. In one building one person went inside the pit and didn't come back. Then a second person went in and also didn't

come back, until the same happened with a fourth person and the fire brigade came and found all of them dead. These are cases of when they went inside the septic tank.

Q: Concerning the issue of the manual emptier being pressured by the house owners to enter the pit. How is this problem being addressed to reduce this pressure?

A: In Bangladesh, emptying is done by a certain class of people (the sweeper communities). They are very known faces within the communities doing this type of work. But now in urban areas there is a mismatch between emptiers and the number of containments to be emptied. SNV is developing a database of every sweeper involved. At the end user side, the major issue is if they don't empty regularly the solids becomes very thick, and that forces the emptiers to go in.

Comment from an emptier: *"I've been in this business for nine months. Often when we clean the septic tanks with the vacutug the household asks that the bottom of the tank is cleaned so that their money is spent well…if it's not completely clean they don't pay the full price."*

Q: In Manila we have had some instances of deaths. In two cases, this was due to poor ventilation and methane inhalation. These incidents really paved the way for safety guards, at least for the Manila concessionaires. Another case was in a commercial establishment, a mall, where something erupted underground. Did you see any changes in the behaviour of the emptiers because of this? Are those incidents something you think would wake people up?

A: With news we went to the secretary and he immediately said 'let's develop a plan with the fire department'. At the top level, the secretary is aware and working to address this issue.

Q: Are there any findings on why these incidents happened? Is it because the septic tanks were very deep? What is the initiative from your side to ensure that such incidents don't happen in the future?

A: The news said it was because of poisonous gas. From the side of our program our message is 'don't go inside even if the household tells you to'. There is a band that changes to a certain colour if the level of carbon monoxide is high. Perhaps we could do something similar for the gases in the pit. However, we actually we don't really want to do that because the emptiers shouldn't go inside the pit anyway. We need to come up with a device to take out the solids, one that scrubs and the vacutug sucks. Practical action is working on this.

Often emptying happens in emergency situations, so there is no time to open and then see if there are gases. The issues could be the design of the tank itself. We're currently developing an inspection modality with Practical action to ensure good design.

3.6.3 ADB on sanitation

Presentation by Michiel de Lijster, Senior Water Resources Specialist, ADB

Michael started the presentation by noting he joined the ADB approximately 4 months ago, and that he is part of the strategic department.

The following provide a summary of the key points of the presentation:

- ADB's water operational plan includes a focus on:

- Expanding wastewater management and reuse, including sanitation
- Expanding knowledge and capacity development that uses technology and innovation more directly
- Enhancing partnerships with the private sector

- Sanitation is in the ADB agenda and ADB is looking into increasing its FSM portfolio. This links to the target of sanitation in the water portfolio to be 25% in 2020, an increase from 14% in 2010
- Since 2012 ADB has invested USD737 million in sewerage programs and USD348 million in sanitation programs
- ADB's also supports capacity building programs. These include knowledge building /sharing events or materials, and Water Operators Partnerships
- ADB manages a Sanitation Trust Fund. This is a USD1.5 million grant by Bill and Melinda Gates Foundation. In this, the focus in on non-networked solutions and pilot demonstration. The underpinning thinking is not a one size fits all and ADB is looking into stepping away from large-scale infrastructure to smaller scale solutions. The approach is to try out solutions for possible relocation and support "soft" components, through capacity building, and policies.
- ADB doesn't work in Africa (its correspondent is AfDB). Their vision is Asia free of poverty, and their mission is to help develop member countries, and this includes sanitation. Ongoing projects under the sanitation trust fund include:
- Bangladesh, India, and Nepal – formulation and design of sanitation solutions for small towns
- Indonesia and Philippines – preparing the city sanitation policy
- Vietnam – preparing the framework for implementing septage management projects
- Mongolia – WASH in schools, communal sanitation systems fir for extremely cold climate

Michael concluded the presentation by re-emphasising that ADB is willing to be more involved in small-scale sanitation solutions and inviting participants to approach ADB. He noted that this requires looking at innovative systems and institutional arrangements, including PPPs.

Q&A:

Q: We're passing 2015 and moving to SDGs. FSM is not yet clear in these goals. What could ADB do for greater focus on this?

A: Sanitation is clearly stated in the SDG 6 and FSM is included in that. What will be important to emphasise is that one size doesn't fits all.

Q: There seems to have bee a change in ADB's strategy/approach. What's the reasoning behind that?

A: Sewerage systems are capital intensive if we're looking into realising the sanitation goals then we need to delve into smaller solutions. There are challenges because in the past there was a great focus

in sewerage and the capacity within the bank also limited, there is greater expertise on sewerage. We have to credit the gates foundation to encourage us to move in this new direction.

Q: In Bangladesh there is an expectation raised around the fact that ADB has supported a certain town and so much another town. How are we going to manage expectations?

A: We're aware of that. It's not only about money but also capacity. This happens not only Bangladesh but in India and Indonesia. We're looking at big figures but also big gains. The answer is around sharing knowledge and cooperation. Money is not the biggest challenge, it's capacity. ADB's idea is to leverage this.

5 BLOCK 4: SMART ENFORCEMENT

OVERVIEW OF BLOCK 4: SMART ENFORCEMENT

Why is this relevant?

Municipalities (or other regulators) don't have the resources to supervise and control everybody. Therefore they need to be clever about where to focus efforts. Smart enforcement is about focusing on timely and proportionate measures. That can be activities that cause most harm and/or stakeholders who will influence many people, using a combination of internal motivators (information, awareness raising), as well as external motivators, which can be positive (incentives for good behaviour) or negative (penalties for bad behaviour).

What were the knowledge and learning outcomes intended from this block?

- Understand and apply key concepts of smart enforcement
- Familiarise and apply tools aimed at devising smart enforcement measures
- Practice articulating arguments for an against enforcement of timely desludging

What was the process?

1. Introductory presentation to block 4
2. Debating game on "The idea of enforcement of timely desludging is both unnecessary and unrealistic"
3. Group activity to devise smart enforcement strategies and measures for own country

5.1 Introduction to block 4, summary of Dgroup discussion on this point

Presentation by Antoinette Kome, learning event facilitator

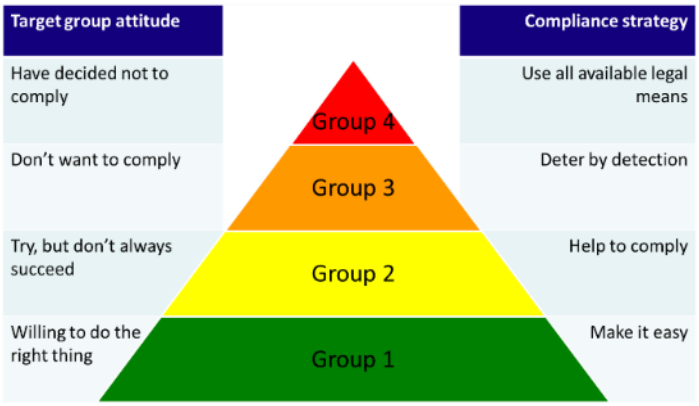
Smart enforcement for whom? To professionalise desludging services and ensure a healthier living environment, a lot of people need to change their behaviour:

- Local governments
- Water utilities (if involved)
- Emptying companies
- Emptier workers
- Households, commercial premises

The focus of the workshop was on the behaviour of emptying companies, emptying workers, and households and commercial premises.

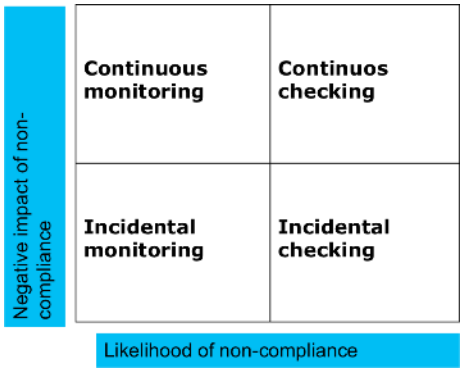
What is smart enforcement about? Smart enforcement consists in being responsive to how well people regulate themselves, measuring efforts in function of the risk, and making it easy to comply and use a combination of measures.

Being responsive to how well people regulate themselves involves thinking about different attitudes to compliance within the target group and what types of compliance strategies are appropriate for each of these. For a given situation there may be a group that is willing to do the right thing (they try but not always succeed), and there may be a group that has decided to avoid compliance differentiation amongst attitudes. The enforcement pyramid below illustrates this. However, for the case of compliance in the sanitation sector, this grouping of compliance attitudes and strategies might not look like a pyramid. (It could even look like an upside down pyramid, in which most people have decided not to comply.)



No government can control everybody all the time, so being "smart" requires focusing efforts, that is knowing your people and your risks. This involves understanding for each risk, the likelihood of non-compliance by a certain group of people and what the negative impacts of non-compliance are. The matrix below assists with this exercise. Based on this classification, the type of compliance monitoring

of a certain target group can be decided (continuous monitoring, continuous checking, incidental monitoring, or incidental checking).



Lastly, to make it easy to comply, a combination of measures that tap into internal motivators and external motivators for compliance should be used. While raising awareness (internal motivators) will help to motivate behaviour change and compliance with norms and standards, it will rarely be sufficient. In addition to internal motivation, we probably need to create some external motivators (e.g. sticks and carrots). Examples of sticks can be: warning letters, penalties, shaming, and threat of withdrawal of licences. Examples of carrots can be: incentives, rewards, public recognition, reduction of taxes and charges.

Often there is a bias towards sticks amongst LGs, but sticks only work if you live up to them, if there is a consequence. So it's important to be careful when choosing sticks.

Internal motivators	External motivators
Education and awareness raising By convincing leaders and professionals directly By peer-to-peer pressure Horizontal learning, creating a new professional culture	Through carrot, such as awards, incentives etc. <--Recognition, praise Through stick, such as performance contracts, penalties, jail…

In the D-group discussion the issue of enforcement was lamented by everyone (users, service providers and regulators and those who comply with standards as well as those who don't comply) and is also often used as an excuse for maintaining the status quo (i.e. that all other issues would be automatically solved only if standards were enforced)".

The biggest risk for non-compliance is containment, that is, the quality of construction of pits and septic tanks. While there are building codes in Nepal and Bangladesh for example, it's hard to make inspection effective for a number of reasons:

- Number of households

- Lack of inspectors, capacity of inspectors
- Lack of monitoring information
- Easier when housing and WASH fall under the same Ministry
- Only at the time of construction you can see it
- No big stick at the top: lack of enforcement creates perverse incentives

E**xamples of "carrots" and "sticks"** (some of these were heard throughout the workshop):

- Positive incentives ("carrots") – this can include for example lower fees or giveaways for people that avail of the service when the truck is in the neighbourhood. It can also include recognition or the "Name and praise" approach. For example, in Marikina City window stickers are awarded to households who participate in the desludging program. Another idea could be to report in the local newspaper progress of community against emptying target.
- Negative incentives ("sticks") – this includes for example licensing for construction of septic tanks and conducting post-construction audits. In the case of Bay, Laguna households who don't desludge receive a notification and ultimately can go to jail. This highlights the relevance of local ordinances in place and being enforced in some of the case studies visited. A form of a "stick" can also be charging higher fees to households who miss the service.

Other **examples of approaches and strategies that facilitate compliance include** (some of these were heard throughout the workshop):

- Having the treatment facility within a reasonable distance
- Financial compensation if the plant is too far away
- Consider is re-use can be an incentive for safe disposal
- Move gradually from collective awareness towards licences
- Co-design voluntary compliance systems
- Make sure everybody, at all levels understands the negative consequences of non-compliance
- Engage lowest levels of government in the right way
- Technology that reduces need to get into the pit
- From small steps, hand-holding towards a licensing system

Examples of "carrots" and "sticks" for compliance by operators (some of these were heard throughout the workshop):

- Positive incentives ("carrots")
    - Convenient disposal location (e.g. Nepal farmer groups who are closer to the city centre and provide a better option for disposal than the dumping site in the forest; transfer stations in Nakuru, Kenya)

    - Bonuses paid to workers for meeting targets
    - Recognition/"Name and praise" (e.g. awards; business featuring compliant operators in the local news as hero)
    - Payment at treatment plant by volume
    - Certification
- Negative incentives ("sticks")
    - Fines to operators who are not licensed and/or that dispose illegally (e.g Hanoi)
    - "Name and shame" (reputation risk)
    - Performance based contracts (e.g Baliwag pays a fixed annual rate to the contractor and controls them closely with GPS truck monitoring and surprise inspections. If the contracting operator doesn't perform their responsibilities according to the ToR then they write a letter of complaint to the contracting company and can used that to justify non-payment of the full rate)

Independently of the "carrot" or "stick" applied, monitoring of compliance needs to be done. There different types of monitoring:

- Inspections
- Citizen monitoring - association of homeowners can monitor operators and the quality of septic tanks. Baliwag is planning to give information on the quality of septic tanks to local government. However this might be a risk for how they may be perceived by communities and acceptance of their services. Associations of homeowners may be in a better position do this kind of monitoring. Another example is a mobile application for citizen voluntary reporting of solid waste collection in Mozambique.
- Self-monitoring/self-reporting – the association of emptiers can be a channel for this. Incentives are needed for industry to self-regulate though. These include penalties/sticks/threat of regulation can be combined with risk of reputation (e.g. tyre industry example from Australia)

5.2 Debating game

This activity consisted of an informal debate, intended as a fun way of engaging with the pros and cons of scheduled desludging. Event participants were randomly assigned into two teams to debate the statement: "*The idea of enforcement of timely desludging is both unnecessary and unrealistic*". There were three 'rounds' to the debate, with each side getting three firmly enforced time slots to speak, with time for teams to retreat between rounds to re-organise arguments and refutes to opposing side's arguments. Several speakers on each side contributed to their speaking slot. The debate was judged on the basis of consistency and coherence of arguments and refutation of opposing arguments, with the group in the affirmative side (against enforcement) winning the debate. The judging criteria were based on the logic of the arguments and persuasiveness. Some of the arguments are summarised below.

Debating statement: *The idea of enforcement of timely desludging is both unnecessary and unrealistic*
Arguments from affirmative side (against enforcement)
• Enforcement never really works specially with political motivations. A politician will come in to get a vote and not to think about pits. He will promise all the good things • People need to be empowered. It's a private affair. So people need to be in control. Law enforcers defeat people's sense of ownership • It should be done from the heart, from the community. "If you want to go fast go alone, if you want go far go with the people. We wan to go with people" • There is no evidence that enforcement creates change • Empower people through education and capacity building so they know what's right to do – *"I know when to wash my dress and when not to wash my dress".* You don't need enforcement when people know what to do • If we cannot enforce construction standards how realistic is it to enforce other aspects? • Enforcement requires a lot of work and incurs costs • If you can't measure it, don't do it. What are you enforcing? We don't know the design standards of septic tanks. Timely desludging assumes you know when have to desludge • It's not true that you can increase coverage by timely desludging. It's a shoot in the dark • I might have 3 people in my family, she might have 6. So it's going to be unfair for some people as the accumulation time is different • If people are empowered then behaviour can be sustained throughout generations. It's long lasting
Arguments from negative side (pro-enforcement)
• It's not a private issue, it's a national issue. This is a public issue, which affects public health. Life cannot be costed. Insurers won't be able to tell you dollar figure • Humans very dynamic and we need suasion. Sometimes behaviour change is not enough • The carrot cannot walk alone, the stick has to be there • Desludging can only work if there is standard infrastructure • Timely is different than scheduled desludging. Timely means before emergency • Enforce and let the people make the choice and provide them with the necessary support • Governments are failing but that doesn't mean that it's not their responsibility • We're not against awareness raising. We need public awareness plus enforcement. It's how you do the enforcement that matters. It needs to be accompanied by community participation and information

5.3 Enforcement activity

Participants were grouped into 5 groups representing different countries and asked to choose a component of the sanitation chain and compliance stakeholder to focus for the activity. To assist this activity, participants were asked to look back at the relevant country diagrams they developed in block 1, and identify critical risk areas within these they would like to focus on for the activity. The following groups were formed:

- Bangladesh 1 – compliance focus: "Households not to connect septic tanks to drain"
- Bangladesh 2 – compliance focus: "Emptiers to adhere to the OH&S regulations"
- Zambia – compliance focus: "Households to construct pit latrines according to standard (both households who already have a house/toilet and those building new houses)"
- Kenya – compliance focus: "Pit emptiers to dump the sludge in the right place"
- Bhutan – compliance focus: "Building owners to construct septic tanks according to standard when they build new houses"

The activity was guided by the following questions around the category of FOCUS, MEASURES, and PROCESS. The emphasis was on identifying focus behaviour and offenders (either because of bigger risk or VfM of interventions) and using behavioural change theory to design a package of measures as well as a process. Due to time limitations, different groups focussed on different aspects of the activity.

5.3.1 Group presentations

Each group presented the results of their group activity. As this varied, the reporting varies accordingly.

Bangladesh 1

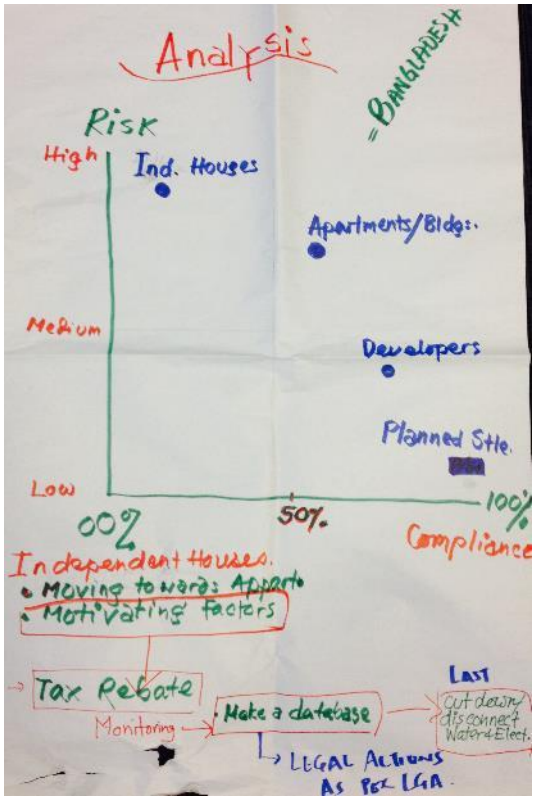
Compliance focus: *"Households not to connect septic tanks to drain"*

Composition of compliance target groups:

- Independent houses (the majority not really willing to comply) - chosen focus group
- Apartments
- Developers
- Settlers

The **focus group** chosen was independent houses.

Matrix of compliance monitoring:



Legal basis: there is an act according to which it's illegal to connect to the drains and imposes penalties

Motivators for independent houses:

- Offer tax rebate and land registration clearance
- Develop a database of households
- Conduct campaign (so households know the law will be enforced). Use local media and engage local councillors to this effect
- Monitor and enforce compliance (engage government, CEOs, local government, magistrate, local administrative people and DC)
- Encourage whistle blowing
- In case of non-compliance send a dispatch notice and enforce penalties and disconnection of electricity/water line if non-compliance persists

Bangladesh 2

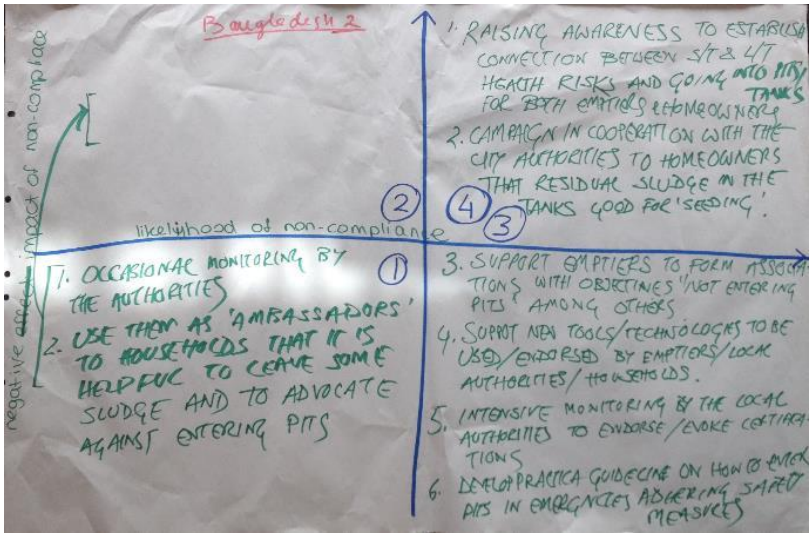
Compliance focus: *"Emptiers to adhere to the OH&S regulations"*

Composition of compliance target group:

1. Municipal vacutug desludger
2. Registered manual emptiers
3. Networked manual emptiers
4. Independent emptiers

Distribution of attitudes towards compliance amongst the target group:

Matrix of compliance monitoring:



Legal basis: there is no legal basis on emptying procedures

Process:

1. Raising awareness to establish connection between S/T and L/T

2. Campaign in cooperation with the city authorities to homeowners that residual sludge in the tanks is good for 'seeding'
3. Support emptier to form associations with the objective of not entering in the pits, amongst other
4. Support new tools and technologies to be used and endorsed by emptiers, local authorities and households
5. Intensive monitoring by the local authorities to endorse/evoke certification
6. Develop practical guideline on how to empty pits in emergencies adhering to safe measures

Zambia

Compliance focus: *"Households to construct pit latrines according to standard (both households who already have a house/toilet and those building new houses)"*

Composition of compliance target group:

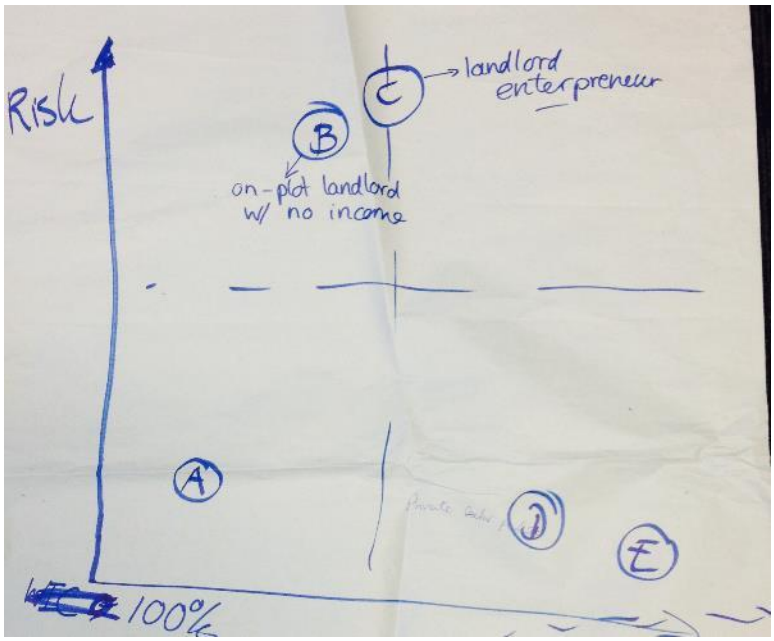
A. Landlords living in plot with income
B. Landlords living in plot without income and sharing toilet with tenants
C. Absentee landlords – entrepreneurs (prime motivation it makes money)
D. Absentee landlords – entrepreneurs (no business)
E. Absentee landlords trying to do something but can't do it

Note: a challenge is that the target group is too diverse. The above is a simplified categorisation.

The chosen **focus groups** were categories B, C, and E as these represent the majority of the cases.

Category E is willing to comply but don't have the financial capacity, and require support.

Matrix of compliance monitoring:



Motivators/measures:

- Groups B and C
    - Awareness raising through mass media complemented with sanitation marketing of cost effective designs
    - Build capacity of masons
    - "Stick" is also needed (because the entrepreneurs have the money but just not doing anything so they need a "stick")
- Group E – make cost effective designs available and provide capacity building and financial support through micro-financing

Kenya

Compliance focus: *"Pit emptiers to dump the sludge in the right place"*

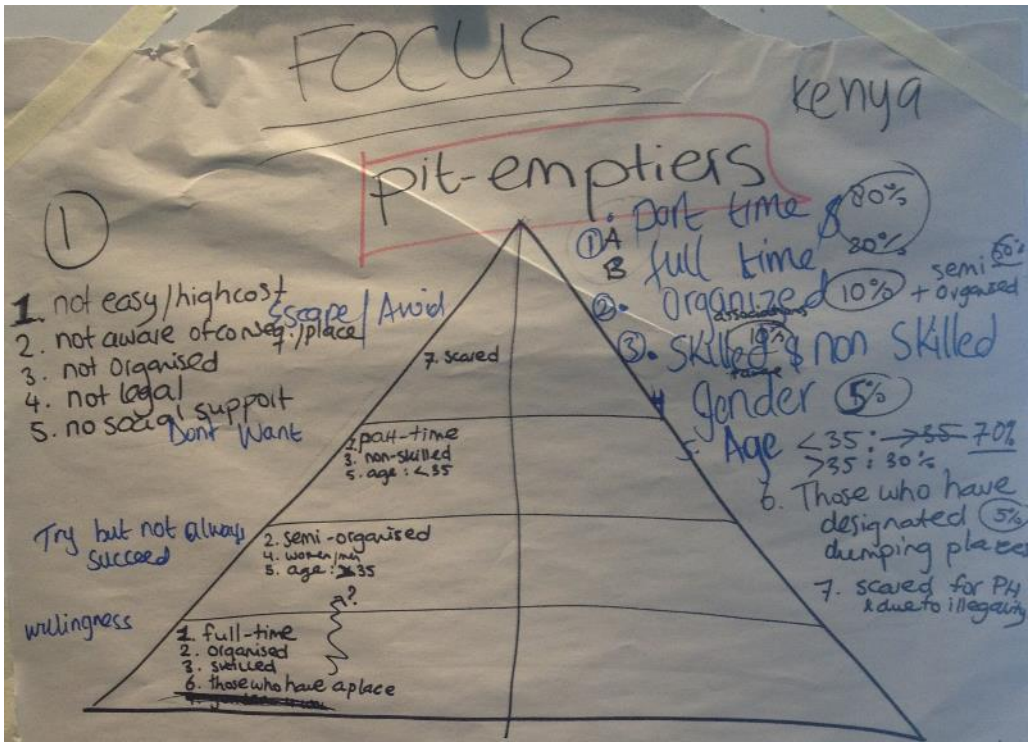
Composition of compliance target group:

- Part-time (80%) and full-time pit emptiers (20%)
- Organised in emptying associations (10%), semi-organised pit emptiers (not on official emptying associations but in one neighbourhood everyone knows who to call, and they have a network they can rely on to provide the service) (50%)
- Skilled (10%) and non-skilled (90%)
- Female (5%) and male (95%)
- Under 35 years old (70%) and over 35 years old (30%)
- Those who have easy access to a designated dumping site (5%) and those who don't (95%)

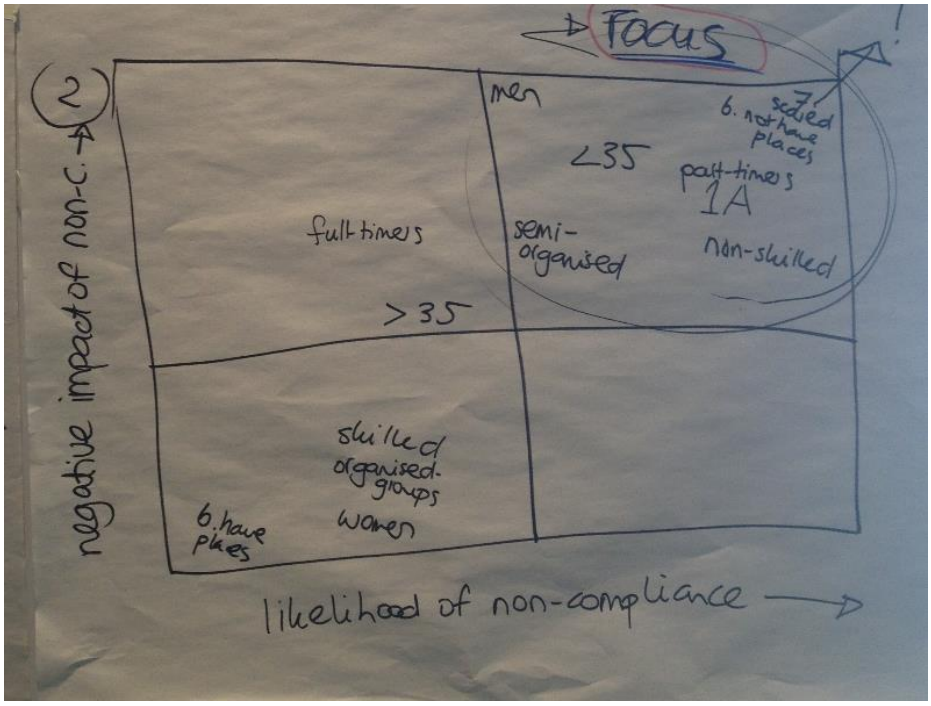
- Those who are scared of public health officers due to illegal dumping and those who aren't

The chosen **focus group** was: non-skilled, mostly part-time, semi-organised, under 35 years old male pit emptiers who have no place to dispose and are scared of the Public Health Officers.

Distribution of attitudes towards compliance amongst the target group:



Matrix of compliance monitoring:



Legal framework: New Public Health Policy 2015 (recognises pit emptying and provides minimal standards)

Motivators targeted at the focus group chosen:

- Internal
    - Like to be professionalised, organised and legalised
    - Peer-pressure
    - Hunger for skills
    - Want their profession to be valued. Hunger for social recognition/status
- External
    - "Cool" image for sanitation team (e.g. change of name, appearance and tools)
    - Awards by local authorities, NGOs, community associations
    - Contract based service delivery
    - Standards and tariffs
    - More designated dumping sites/transfer stations
    - Transport and emptying solutions, and financing
    - Penalties for non-compliance and illegal emptying
    - Stickers for official emptiers and households who have been emptied

Process:

- Create good relationships between PH and pit emptiers (training of both)
- Improve skills and knowledge
- Improve information about toilet facilities and emptiers
- Approved and increased number of collection and disposal points, as well as transport and disposal solutions
- Set standards and tariffs
- Recreate image and re-brand (used media, village chiefs, and sensitisation of community)
- Award events
- Strengthen the legal framework
- Stickers for emptied households and official emptiers

Bhutan

Compliance focus: *"Building owners to construct septic tanks according to standard when they build new houses"*

Composition of compliance target group:

I. Educated building owners (BOs) with economy background ("well off" economically)

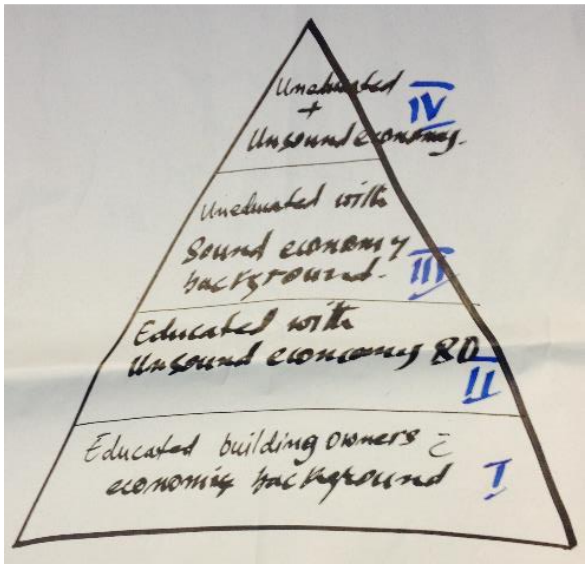
II. Educated BOs with unsound economy background

III. Uneducated BOs with sound economy background

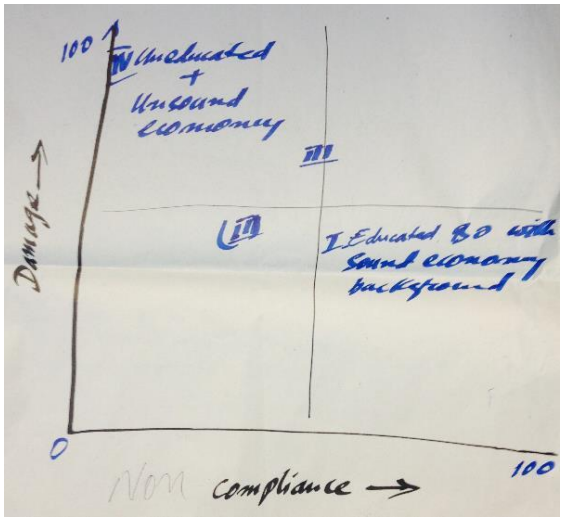
IV. Uneducated BOs with unsound economy background

The **focus groups** chosen were categories II and IV.

Distribution of attitudes towards compliance amongst the target group:



Matrix of compliance monitoring:



Motivators:

- Education and awareness raising on septic tank design, risks and benefits
- "Stick" - if building owners don't comply disconnect water/electricity services and pay a levy penalty (this will be charged when there is illegal effluent discharge into the effluent due to poor design of the septic tank)
- Dissemination of information at approval level
- Enhance monitoring during construction

These measures will require support from the municipality, community leaders (to advocate for compliance amongst building owners), and environmental officers (to do spot checking).

Process:

1. When owners come for approval provide them with information on what should be done (e.g. guidance on size, number of users, etc.)
2. After 1-year monitor compliance and record number of buildings that are compliant and non-compliant. Issue compliance certificate to compliant building owners and penalise non-compliant ones
3. Review how many building owners violated the rules
4. Revisit process and redesign it to reduce number of violations

Monitoring needs to happen at different points of construction: before, during and after construction.

6 BLOCK 5: COUNTRY GROUP SESSIONS AND WRAPPING UP

OVERVIEW OF BLOCK 5: COUNTRY GROUP WORK AND WRAPPING UP

Why is this relevant?

The ultimate goal of the 'knowledge and learning' component of SNV's SSH4A-urban program is for practices on the ground to be improved through learning about 'best' practices. Learning is improved through discussion and reflection on what has been learnt which are the aims of this block.

What were the knowledge and learning outcomes intended from this block?

- Consolidation, reflection about what has been learnt

What was the process?

1. World café exercise – giving advice as 'consultants' on key challenges faced by each country, applying new (and old) knowledge and learning
2. Checking 'shopping bags'– internal country group reflections on what has been learnt that they want to share to improve practice in their countries
3. Country group sharing of reflections on learning highlights and commitments on what they will take back in their 'shopping bags'
4. Closing notes/comments on the learning event

6.2 World café – advice to address key challenges

Country-based groups discussed and prepared briefs on issues/problems in their countries that they seek advice on from 'consultants'. One or two people from the country group were appointed to be the country 'client' while the remaining participants were allocated to 6 mixed groups of 'consultant companies'. The 'consultant companies' then rotated to country 'clients' for briefing and offered their advice to the questions in 15 minutes.

The briefs and advice offered are summarised below.

Bangladesh

ISSUE AND PROBLEM/BRIEF FOR CONSULTANTS
Ensure upgrading of sanitation containments
ADVICE FROM CONSULTANTS
• Survey size and conditions of pits and septic tanks • Select a number of towns to pilot enforcement • Engage government, households, development partners and financial institutions in the design of design guidelines • While working in poor/challenging areas, an alternative containment can be constructed to improve on the existing containment

Indonesia

ISSUE AND PROBLEM/BRIEF FOR CONSULTANTS
Convince and empower local government to put FSM as their top priority
ADVICE FROM CONSULTANTS
• Develop a step-by-step guide on FSM, and how to prioritise efforts • Conduct a city-wide FSM gap assessment and develop practical guidelines • Advocate for top level (national government and top management) and community buy-in • Devise incentives to motivate the implementing agency • Partner with organisations who have expertise in capacity building

Bhutan

ISSUE AND PROBLEM/BRIEF FOR CONSULTANTS
Ensure safe sludge disposal
ADVICE FROM CONSULTANTS
• Communicate sludge management as linked to environment and health costs • Awareness raising and capacity building of communities to advocate the issue with local governments and politicians • Use existing stakeholder platforms to create a voice towards decision markers • Look for value-adding opportunities to make sludge management profitable and develop a business model • Look for opportunities for co-management of sludge with solid waste and water, as this might be more appealing for private sector investment • If data is not already available, undertake a rapid assessment of the effects of sludge disposal on the environment and public health. Compare the cost of these impacts with the investment cost of a septage treatment plant

Kenya

ISSUE AND PROBLEM/BRIEF FOR CONSULTANTS
Ensure that the public health department actively and positively contributes to good sanitation practices
ADVICE FROM CONSULTANTS
• Find out what are the motivating factors of public health officers and build incentives that tap into these (e.g. overseas travelling, financial gains, etc.) • Create competition between countries • Promote sharing of good practices amongst public health officers • Establish an autonomous authority to monitor the role of public health officers against their mandate • Provide continuous capacity building of public health officers • Conduct a skills and SWOT analysis • Promote discussion of performance and solutions to improve it at the national level • Form a national level committee including all relevant ministers (directly and indirectly related to water and sanitation) • Involve public health officers in some of the paid activities of projects (pay them an extra on top of their salary)

• Awareness raising and information dissemination • Conduct a public hearing with the public health departments and communities • Promote close coordination between ministries

Zambia

ISSUE AND PROBLEM/BRIEF FOR CONSULTANTS
Ensure that the local authority enforces regulation on latrine construction
ADVICE FROM CONSULTANTS
• Capacity building • Promote grassroots involvement • Promote stakeholder meetings and consultations, through technical working groups and communication campaigns • Sensitisation of high level decision makers and politicians • Involvement of decision makers and politicians in the development of standards • Make an overview of the service chain organisation • Set up a revolving fund for the service provider • Set up a development fund from the government targeted at vulnerable communities • Motivate politicians to impose by-laws • Motivate communities to comply with by-laws • Make politicians and decision-makers the champions • Clearly defined incentive and enforcement strategies

6.3 Country group reflections and take away messages in "shopping bag"

An important objective of the learning event is that participants take away a 'shopping bag' full of new ideas and learning to influence practice in their own countries. Documenting what participants share about what is in their 'shopping bags' holds participants accountable to knowledge and learning they pledge to take back.

Country	Shopping bag content
Nepal	• The importance of the policy framework being supported by a local ordinance • Technology exposed to through field trip might be applicable to Nepal • We learned how to strengthen engagement with business. Good to reflect this at a policy level. Need to create support framework for promoting private

Country	Shopping bag content
	sector • Enforcement activity was very useful. Will make use of this as a tool. A mix of carrot and stick is needed • OH&S presentation from Bangladesh and shared episodes of people dying from emphasised OH&S as a very important issue
Bhutan	• Very useful event. The expectations set at the beginning of event was to understand different models of emptying, learn about OH&S practices, and learn about the advantages of scheduled and desludging. The event has addressed all of our expectations • Take home message concerns services can be more effective if outsourced. In Bhutan there are no NGOs or other non-government organisations dealing with sewer and septage management. So need to explore outsourcing to PS. So there has been engagement of PS in solid waste management but not in sludge management • The importance of the local ordinance. This is lacking in Bhutan
Bangladesh	• The model of a partnership between a local authority and the PS can be considered for Bangladesh • Was exposed to new automated technology (e.g. screw press) which can be used in Bangladesh • If working with a water utility, then can include the FSM tax, which should be just for the operation of the plant. Households should pay another fee for the emptying service • Some service providers giving the impression that emptying is for free whereas it's actually included in the water bill. Currently working on financial mechanism which aims to charge on a volume basis • Avoid transporting in peak hours • The smart enforcement activity is a very useful tool
Indonesia	• Expectations at the beginning of the event were met. Learned how other countries are doing enforcement and about institutional arrangements from the Philippines and other countries • Learned about profitable business models. PPPs can work. There were some good examples of this

Country	Shopping bag content
	• The enabling role of the national and local government, and how to give more power to local government • The importance of regulation and the local ordinance to boost implementation of FSM • Practical guidelines on citywide perspective will be very useful. Although in Indonesia may need more than 200 types of guidelines • Need to be smart on enforcing. What type, to whom, and which approach
Mali	• Thank you for the openness and sharing • Learned a lot, despite the language barrier the shopping bag is full. There was a lot of information and innovations relevant to Mali • The smart enforcement tool was very useful • Learned about mechanisms of financing of sanitation and PS involvement and how to better register and organize manual emptiers as in Bangladesh • Learned about the advantages and disadvantages of scheduled and on-demand desludging • Learned about reuse and disposal of sludge by farmers
Kenya	• At the start of the workshop had 3 expectations: learn about different technologies and how they work; learn about socially acceptable and economically viable models; learn about roles and buy-in of different players within the desludging business • The main take home message is that enforcement is very important. Even if have technology, acceptance and awareness of people is critical. To make enforcement smarter there is a need to have relevant standards relevant to equipment, treatment plant, transport, etc. • Models that work have an element of smartness. If there are no people embracing emptying then there is no business case. In one case there were 70% not embracing but still the service provider was making money • Involvement of all relevant stakeholders is important and can included stakeholders to engage the rest of stakeholders who are not engaging (e.g. concessionaires making efforts to engage the 70% not embracing emptying) • FSM is a public affair. The public sector has a leading role but have seen how engagement of the PS can work. There is an opportunity for PS

Country	Shopping bag content
	• Made useful contacts in the learning event
Zambia	• Learned a lot from other countries, particularly on enforcement and OH&S • The main take home message concerns the involvement of organised PS. In Zambia there is a degree PS involvement but these are individual or groups of 2 people. In Manila saw the impact of organised PS. • There is need for strong enforcement. There needs to be a nationally agreed framework and local authorities must develop ordinance/by-laws • Very impressed with how the workshop was organised, particularly the focus on being strategic, prioritise and see who the target group is, and how to work with them • SNV in Zambia is not yet into urban WASH but have WSUP colleagues who SNV has worked with previously • The event has provided the opportunity to establish a relationship with Lusaka Water and Sewerage company
Zimbabwe	• The relevance of communities' willingness to pay • Municipalities must increase customer care and satisfaction, and implement a client charter. These can also have pre-paid services (metered). This can be a sort of smart enforcement measure

6.4 Closing of Learning Event

Closing vote of thanks from Antoinette Kome, learning event facilitator

Antoinette started by acknowledging the participants whose first language was not English and expressing appreciation for their participation and contribution to the workshop. She also thanked Dave Robins and Nene Narvaez, and emphasized that without them the workshop would have not been possible. In addition to these she also thanked the presenters, and Janina Murta and Nienke Andriessen for the assistance in documenting the workshop. A special thanks was also given to Rosalia Vergara for the organisation of the event. Finally she thanked all participants, and concluded by asking participants to fill in the evaluation form and inviting everyone for the group photo.

Closing comment by some participants

Some participants expressed how grateful they were for their participation at the workshop and how impressed they were with the organization and facilitation of the workshop. Some of the closing notes included:

"Thank you. It has been a long time since I was in this type of international environment. You made me remind how great it is."

"It has been an exceptional workshop. I met people who are on top of their business. It's my first time at a learning event and I'm amazed how people remained engaged. There was no sleeping in the workshop. It was no lunch workshop, this has been a real workshop were everyone put their best foot".

"I've picked that apart from technical solutions what matters is strong relations between service providers and households, through home owner associations and targeted campaigns…and the need for strong dedicated FSM by-laws, the ordinances."

Annex 1: Images from the learning event

Annex 2: DGroup discussion summary

DGROUP DISCUSSION SUMMARY "URBAN SANITATION – PROFESSIONALIZATION OF SLUDGE EMPTYING SERVICES"

CONTENTS

SNV

INTRODUCTION

This is the summary of an email discussion held on the Urban Sanitation and Hygiene Dgroups platform from the Wednesday 21st of October till the 27th of November 2015. The discussion was moderated by SNV knowledge network, and involves 282 member from 40 different countries (mostly Asia and Africa).

Forty-one contributions by 33 people from 16 different countries were written over the course of the discussion. The discussion aims to bring together examples and perspectives of practitioners from the field with perspectives from people working at international level. It also aims to reflect together on new ideas and best practices in sanitation and hygiene. Needless to say, it is not intended as a conclusive document on the subject.

This is the fifth discussion in this series. Previous Dgroup discussions included: "Urban sanitation planning and finance" (2012), "Financing for urban sanitation infrastructure investment" (2014), "Urban Sanitation – Upgrading and emptying of on-site facilities" (2014), "Septage Transfer Stations (2015). The discussions are linked to the learning component of the urban Sustainable Sanitation and Hygiene for All programme in Nepal, Bhutan, Bangladesh and Indonesia. This summary will be an input for the regional workshop on "Urban Sanitation – Professionalization of sludge emptying services" in Manila, Philippines from Monday 30th of November till Thursday 3rd of December 2015.

TOPIC 1: TO SCHEDULE OR NOT TO SCHEDULE DESLUDGING, THAT'S THE QUESTION.

WHAT IS SCHEDULED DESLUDGING, AND WHAT'S THE MAIN DIFFERENCE BETWEEN SCHEDULED AND ON-DEMAND DESLUDGING?

I started the background by stating that scheduled desludging is planned emptying, usually with a regular interval. In contrast, "on demand" emptying only happens when there is a request by the owner of the pit or septic tank. Usually scheduled desludging services move from neighbourhood to neighbourhood, providing advance notice to owners about their turn.

The main difference, as indicated by Foort Bustraan[1] and Freya Mills, both in Indonesia, is that in on-demand desludging the owner is expected to make the decision whether and when to empty. This assumes, as Ringisai Chikohomero from Zimbabwe puts it, "an enlightened community" regarding sanitation. And Reza Petwary from Bangladesh adds that it also assumes that the owner knows when it is timely to empty. Both these assumptions are hard to realise. Moreover, unless it is an emergency and sludge is coming upwards out of the toilet, there is very little incentive for owners to act. The pollution of the living environment is more a collective problem than a household problem.

In a system with scheduled desludging, the decision whether and when to empty lies with the local authorities or service providers. Lita Istiyanti from Indonesia, and Françoise Coulibaly from Mali, both state that the main difference is that scheduled desludging results in a much higher uptake of the service (demand). Ousmane Ibrahim from Mali adds that another important difference is that in on-demand emptying transactions happen only between the owner of the septic tank/pit and the emptier. This is hard to regulate. This is echoed by Brahima Traore from Mali as well.

[1] A nice video about scheduled desludging in Jakarta (by IUWASH) can be found here: http://iuwash.or.id/US/de-sludging-jakarta/

Of course in theory, on-demand desludging services could also be regulated for prices and safe disposal. Edmundo de Almeida from Mozambique writes that in the past there was a Municipal Inspection Department which would detect failing tanks and fine the owners. In Malaysia there is now a regulated on-demand emptying system, in which the main service provider has a data base of all on-site facilities and sends reminders to the owners when it's time to empty. These can then use one of the service providers. Unfortunately uptake of the service has already dropped compared to the previous scheduled desludging model.

TO SCHEDULE OR NOT TO SCHEDULE DESLUDGING...

The vast majority of contributions advocate for scheduled desludging, in spite of the fact that there's still little experience in the countries. As Chiranjibi Tiwari from Kenya says, scheduled desludging has huge benefits, the question is not "whether or not", but "how"." Foort and Ousmane write that the decision whether and when to empty should not lie with the owners (households) because benefits and costs are for the whole community. Sanitation is a public good. However, not everybody is in equally positive.

Simon Okoth from Kenya and Edmundo from Mozambique suggest that scheduled desludging will only work under certain circumstances as it requires a level of organisation that is rare in cities and towns. Edmundo says for example that it can only work in Beira, and Simon suggest that scheduled desludging should be confined to cities with robust economies, no big inequalities and/or have subsidies for low-income people. This stands in contrast with Ringisai's view who feels that in Zimbabwe scheduled desludging is preferred because the required level of organisation will help.

Freya sees the benefits of scheduled desludging, but recommends not overselling it, as health benefits will only materialise over time and once households have upgraded their containment.

Erik Noerremark from Mozambique and Lawrence Kimaru from Kenya, strongly feel that scheduled desludging is not the right way to go. Erik feels that it misses the point and that by ensuring the right type of storage capacity in pits, the need (and cost) for emptying can be avoided. He provides detailed instructions of how to construct such pits. This option is only for areas with low ground water tables of course. Lawrence does not see scheduled desludging as a viable option because he feels that the current structure and stakeholders in the sector are not ready for this. He feels that the solution to emptying should focus on pricing and technology. Moreover he advocates for a formal recognition of lower tier emptiers to avoid illegality, and related illegal dumping.

WHAT DO YOU SEE AS ADVANTAGES AND DISADVANTAGES OF SCHEDULED DESLUDGING IN YOUR CONTEXT?

The main advantages of scheduled desludging are seen as:

- Ensures timely emptying
- Easier/ cheaper to monitor pricing, who operates etc., opportunity for reducing illegality
- Easier to introduce standard operating procedures (SOP) around safety, parking, spilling, disposal etc.
- More efficient use of human resources
- Efficiency and cost reductions, especially regarding fuel costs.
- Easier to introduce mobile transfer stations which can further contribute to efficiency
- Possibility to introduce scheduled payment
- Easier to introduce cross-subsidies
- Potential to link to upgrading of on-site facilities

- Creating greater awareness as more people use the service

The biggest disadvantage everybody sees is the high level of organisation and coordination that is required to ensure the service. Dave Robbins from the US says that the system is vulnerable, because coordination tends to break down over time. Chiranjibi Tiwari and Stella Warue from Kenya both mention that even in their context, with well-established WSPs, who have the mandate, it is a challenge to make them respond. Moreover as Lita says scheduled desludging requires investment in terms of emptying devices, trucks, transfer stations, treatment facilities. Reza explains that it is also a challenge (in terms of time and resources) to ensure all the preparations and in particular to define the right price for the service. This is also mentioned by Chiranjibi.

I would like to step out of my role of facilitator for a moment to make a small comment. I do see the challenges of introducing scheduled desludging, but I think that the argument about the required organisation is not fully correct. If we would aim to have a system of safe on-demand desludging, that would require a high level of organisation as well.

Rosaline Yoni from Mali writes that the key issue will be for the local authority to create the pre-conditions for scheduled desludging, among other things budget. Ringisai, Lita and Rosaline all also emphasize the importance of an awareness campaign and community mobilisation as part of scheduled desludging.

Several people, Lawrence, Stella, Simon, Freya, Reza among others, have serious doubts whether most local authorities have the capacity and commitment to provide proper and reliable services. And if that commitment fades, who will hold them accountable? People might be paying anyway if the payment is in instalments. This happened at some point in Dumaguete. The households kept paying for the service as part of the water bill, but there was no longer a scheduled service. Rather the service became on-demand. Households did not complain because the surcharge was very low and they seemed happy to avoid the hassle of emptying.

Another concern, as Lawrence and Chiranjibi say, due to the lack of competition, it could be that households pay unnecessary high prices. Another argument against regular desludging is that not all households will need the same frequency of emptying due to different household size and different pit/septic tank sizes. Freya asks whether it is fair to charge people for a service that strictly speaking they do not need so often. Several others also mention the heterogeneity of the potential customers.

A particular question is whether scheduled desludging will benefit the low-income communities. Chiranjibi explains that in Kenya emptying services are available on-demand for richer household, but that the challenge is in the low-income areas. Will the service provider be willing to adapt for the context of these communities? Erik mentions that pit latrines cannot be emptied by vacuum trucks because of the thickness of the sludge and the amount of solid waste in the pit.

DO YOU FEEL THAT SCHEDULED EMPTYING AND COLLECTION SERVICES WILL CONTRIBUTE TO A CLEANER AND HEALTHIER LIVING ENVIRONMENT?

Many people say yes, scheduled desludging will contribute to a cleaner living environment because at least part of the pollutants are removed by emptying. However Freya questions this. She states that environmental and health gains are unclear as many people have leaking pits/ septic tanks anyway. This means that the living environment and/or groundwater are contaminated anyway. Dave agrees that only when facilities are gradually upgraded as well, the living environment will become safer.

Freya does feel that regular desludging in pilot areas increases the city's service capacity to manage on-demand serve as well. Simon and others agree that either way a blended service of scheduled and on-demand emptying is needed. Dave mentions that even highly professionalised services such as Maynilad Water, have an on-demand service for emergencies in addition to their scheduled service.

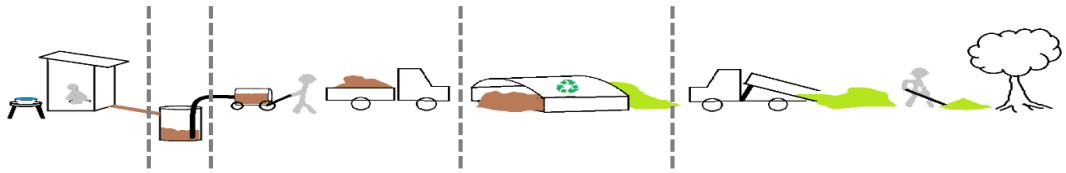
Topic 2: Operational Health and Safety

Main health and safety risks in sludge emptying and transport

First and foremost, the biggest risk as indicated by Reza Patwary from Bangladesh and Reinilde Eppinga from Kenya is that most emptying happens illegally. In Nakuru, in Kenya, pit-emptying often happens during night time, because these are not legal services. In Bangladesh, some of the emptiers have registered jobs with the local authority, but the vast majority provides the service "illegally but tolerated". The situation in Bangladesh is particularly complex, because emptiers belong to a specific social group, Dalits, which has limited other employment opportunities.

Stories are horrific, such as collapsing pit latrines with people in it, some very deep pit latrines where people suffer from heat and/or inhale poisonous gas, or the danger of smoking a cigarette while opening the lid of the tank. Reza Patwary and Rajeev Munankami from Bangladesh shared a number of links to news stories from fatal incidents related to emptying. Also Ousmane Ibrahim from Mali mentions these risks, and adds the risk of explosions due to the gas, the risk of injury from sharps in the pit. However, Jamie Radford from the UK, quoting Steve Sugden's story on Bangalore, writes the pit emptiers themselves felt the biggest risk of their activity was alcoholism. Osbert Atwijukye from Uganda finds that fatal accidents while pit emptying are normally linked to alcohol.

All contributors agree that by far the biggest risks are around manual emptying and especially people entering the pit. In Kenya, Uganda, Bangladesh, and Mali, entering the pit is seen as practically unavoidable, because consumers insist on having the more solid contents emptied. Though some technologies are being developed, this is not always adequate, especially when pits are very deep or haven't been emptied for a long time. In the case of Indonesia and Bhutan, as explained by Freya Mills and Ugyen Rinzin respectively, entering the pit is uncommon. Nevertheless there are still many safety issues- contamination related- along the sanitation value chain. These contamination related safety issues will not be immediately be fatal, like the risks mentioned above, but do affect health and well-being of emptiers and the general population. A generic overview of risks below:



User interface	*Containment*	*Emptying*	*Transport*	*(Transfer stations)*	*Disposal*	*Treatment/ re-use*
	Seepage *Overflowing containment* *Unlined/ unstable pits*	*Collapsing pits* *Entering pits or falling into pits* *Inhaling poisonous gas* *Explosions* *Spilling while transferring to the truck or transport device*	*Spilling the whole way!* *Leaking valves*	*Leaking transfer stations* *Improper use/ access*	*Disposal on-site or unsafe dumping elsewhere*	

		Use of Kerosene *People working without shoes, or any gear* *Removing solid waste from the pit.* *Removing rags/ rubbish from hoses without bare hands* *Limited personal hygiene practice*	*An accident!*	*by community*	*Spraying when discharging from the hose* *Manual raking and cleaning screens*	

A specific case shared by Reza is when a hose was disconnected after emptying, the residual sludge in the hose spilled over the front yard of the house. Cleaning was done with only water (not disinfectant).

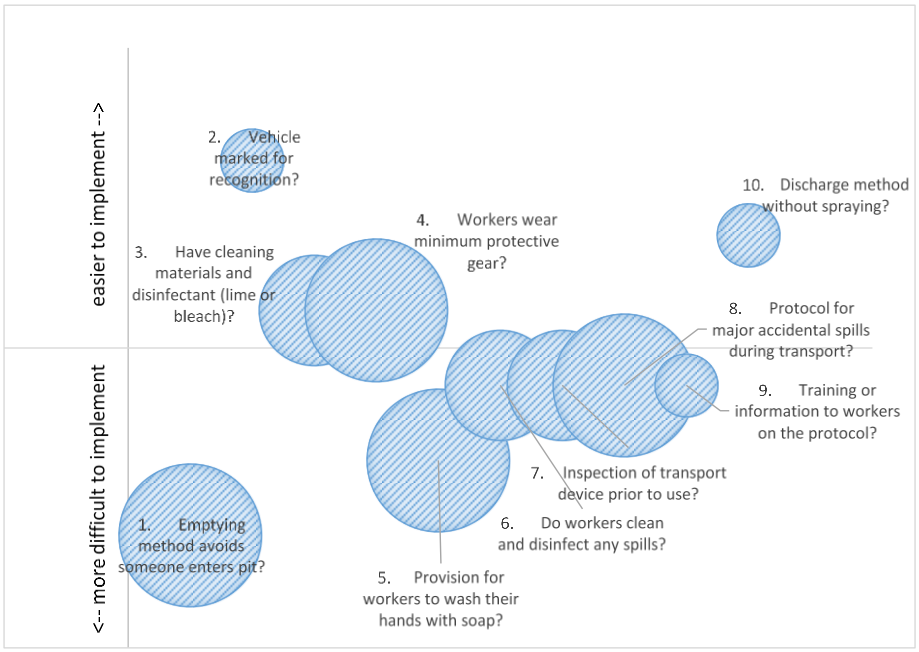
WHICH OF THE HEALTH& SAFETY ASPECTS CAN BE REALISTICALLY ACHIEVED IN OUR CONTEXT?

Rajeev mentions that there may be policies, regulations, guidelines etc. for safety, but this is obviously ineffective without translation into practice in the field. At the moment, it seems that we are dealing with a generalised lack of awareness on the part of emptiers themselves, the related government officials and their superiors, as well as the households. In some cases, Reza writes, the government could be avoiding responsibility by having households directly contract emptiers and not regulating this. Rajeev shares that during formative research it was found that consumers (households) are unaware and not concerned about health and safety issues of emptiers. Irfan Arianto from Indonesia and Gem Tshering from Bhutan mention that operators are sometimes aware, but will not always practice. Overall it can be concluded that there is no culture of safety around emptying and transport, as Reinilde points out. Rajeev suggests that a dedicated awareness campaign at different levels will be needed.

However, changing behaviours through awareness raising or regulation only is difficult. Therefore Jamie suggests that a first priority should be to eliminate or reduce the risks, for example by introducing new technologies which make certain emptying practices unnecessary. As Osbert says, the focus should be on minimizing sludge contact and make emptying quicker. In Uganda the team has been promoting the Gulper, which pumps thicker sludge than a vacuum pump. This is proving to be a significant change in terms of not entering the pit. However, according to emptiers in Uganda, the limitations are that the Gulper only goes to 1.5m deep, is physically very tiring for the emptiers, takes a very long time to empty and cannot pump the solid waste in the pits. Both Jamie and Osbert suggest that the strategy is to try and solve this issue through development of better emptying devices.

Ousmane points out that the implementation of safety protocols (protective gears as well as other measures such as cleaning up spills, better transport equipment etc.) costs money. To make implementation of safety protocols realistic, there will have to be some cost sharing between emptiers and community, otherwise this will push poor people out of a job or just not happen. As Reza says, a well-designed incentive system should reduce the threat of unsafe behaviours, e.g. dumping, spilling, making risky behaviours more expensive than safe behaviours.

I asked you to indicate on a check list, which practices would be easier to implement and which would be non-negotiable (should always been done). I have tried to consolidate the answers in the graph below. The bigger circles mean it's more important to implement (non-negotiable). The lower, the position, more difficult the implementation would be. While wearing personal protective gear is important, this is not the only safety measure that needs to be considered.



WHERE TO START? WHAT WOULD BE THE PROCESS TO INTRODUCE BETTER OPERATIONAL HEALTH AND SAFETY IN FSM?

While research to develop better, safer emptying devices is ongoing, some steps can already be taken to make progress towards better operational health and safety in FSM. A first measure towards better operational health and safety in FSM is clearly to bring the service into legality. This is not straightforward, because emptiers themselves are usually wary of greater government oversight and possible related payments. This needs to be discussed and negotiated.

A second step, following Irfan's remark, is that any process should start from a good understanding of actual practices on the ground. For example, in the case of South Lampung, Indonesia, there are many things to improve, but workers always wash their equipment and their hands after the service. Similarly, Osbert cautions against recommendations without information: he suggest that nose masks, when re-used, can become a source of infection instead of a means of protection.

Reinilde mentions that in Nakuru, Kenya, they are working on Occupational Health& Safety Standards as a guidance for both Public Health and the pit-emptier association. Also teams in teams, Bangladesh and Indonesia, have started to develop Standard Operational Procedures. Information and awareness should come well before inspections and penalties. It seems important that all stakeholders, government, emptiers, utilities and customers are informed and involved in some way, to contribute to a culture of safety. Specific information and training for emptiers will also be needed. Freya adds to this the provision of washing facilities, disinfectant and equipment, as well as maintenance of emptying equipment, to emptiers.

Once there is greater acceptance, self-monitoring and certification can be considered to enforce continuous use of safety measures.

TOPIC 3: THE ROLE OF SMART ENFORCEMENT[2]

ENFORCEMENT OF WHOSE BEHAVIOUR?

Enforcement seems a huge, almost insurmountable challenge in many countries, but at the same time, something that we need to tackle rather than ignore for "too difficult". Professionalising emptying services will require a lot of people to change their behaviour, and even if there are norms& standards, there are many reasons for people not to comply, such as:

- Ignorance (people don't know about the norms& standards or how to comply)
- Economic reasons (someone makes money or saves money by non-compliance)
- Lack of enforcement (people think that they will not get caught)

As Nadira Khawaja from Nepal said in her mail: "The issue of enforcement is lamented by everyone (users, service providers and regulators and those who comply with standards as well as those who don't comply) and is also often used as an excuse for maintaining the status quo (i.e. that all other issues would be automatically solved only if standards were enforced)". She points to the fact that very often the lack of enforcement is de-personalised, as if it's simply the context, nobody's fault and thus also nobody can fix it. She shows that this is just untrue, because compliance with standards is the result of human decisions and can be improved.

The implicit focus in this discussion has been how local governments can move forward, improving environmental health in their city or town. However, in some contexts, the municipality or city itself is the biggest offender, not providing services, or dumping in the wrong places. Of course that then becomes an excuse for everybody else to do the same…

For the sake of the discussion below we have assumed that there is certain political willingness of local governments to improve environmental health, and we focus on the compliance of users (households, institutions, commercial users), and service providers (manual emptiers, owners of vacutugs, tanks etc.) with norms& standards.

WHAT PARTS OF THE SANITATION VALUE CHAIN CARRY MOST RISKS IN TERMS OF NON-COMPLIANCE?

Obviously no municipality/city (or other regulator) has the resources to supervise and control everybody. Therefore municipalities need to be clever about where to focus efforts. Smart enforcement would be to focus on areas with the most effect. That can be activities that cause most harm and/or stakeholders who will influence many people.

Smart enforcement is also about using a combination of internal motivators (information, awareness raising), as well as external motivators which can be positive (incentives for good behaviour) or negative (penalties for bad behaviour), as and when appropriate. Finally, smart enforcement is to use timely and proportionate measures for enforcement.

The majority of contributors, considers that the most risk for non-compliance is containment that is the quality of construction of pits and septic tanks. While there are building codes in Nepal and Bangladesh for example, it's hard to make inspection effective. Meena Shrestha from Nepal mentions that for house construction a construction permit is needed before hand (on the basis of drawings) and a completion certificate after the construction is completed. However, it seems that not always municipalities monitor the site before issuing the completion certificate. Nadira Khawaja

[2] Part of the introduction to this topic was based on briefing paper 6, by Rob White and Diane Heckenberg, School of Sociology and Social Work University of Tasmania, July 2012.

from Nepal mentions the difficulties of inspection due to the mere number of households, and that many households construct soakage pits instead of approved septic tanks. This is not always due to ignorance. Gem Tshering from Bhutan writes that without enforcement of an emptying schedule, building owners are tempted to let their septic tanks overflow or even to make a hole in the wall so that it never fills up.

Aftab Opel from Laos explains that enforcement of building standards of septic tanks in Bangladesh is more challenging than in Laos. Building codes are in place in both countries. However, in Laos the approval for buildings as well as WASH are under the same ministry (Ministry of Public Works and Transportation), whereas in Bangladesh there is a disconnect because building codes fall under the Ministry of Housing, but they are not responsible for WASH. Reuben Sipuma from Zambia mentions a similar challenge in his country: onsite sanitation falls under different Ministries: Local government and housing, and Ministry of Health. Moreover, political figures tend to avoid unpopular decisions such as enforcing standards, and rather give away toilets.

Chiranjibi Tiwari writing from Kenya, points out that the added challenge is that standards for containment can only be enforced at the time of construction. Aftab points out that standards can only be enforced if there is also an emptying service, it is thus a chicken and eggs issue.

Nadira and Chiranjibi are of the opinion that the regulation of emptying and transport is relatively easy compared to regulating containment. Nadira calls it a case of "smart economics", as long as the incentives are right, the sanitation value chain will function properly. Joanne Chong from Australia suggests the same. She says that monitoring is hard and implementing penalties as well, but a "carrot" approach by getting the right incentives in place could do the trick. Chiranjibi writes that standards for emptying and transport are easily enforced, because those failing can be punished by revoking their licence to operate.

Safe disposal is often limited by the lack of treatment/ disposal facilities within a reasonable distance. Sanjay Singh from India finds that the biggest challenge is safe disposal, not only due to the lack of treatment plants, but also because in his context local governments are less interested in on-site sanitation and faecal sludge management. Another risk is the failure of operators to provide PPE to their workers.

Aftab and Nadira feel that emptiers can only be held accountable for safe disposal if governments create the facilities for disposal, such as treatment plants/ dumping sites, or even financial compensation when treatment plants are very far away. She provides the example of Surkhet municipality where an on-demand emptying system is in place. The municipality contracts the service out to private sector but these dump the sludge haphazardly or spread it on rice fields, because this is closer by than the current dumping site in the forest. The municipality and the agriculture office are now piloting a process of on-farm treatment to allow for safe re-use in farm fields. It is expected that this will create incentives for safe disposal.

Chiranjibi and Er Abid Hussain from Nepal point out that the practice of re-use and EcoSan models require relatively stronger enforcement due to the health risks related to improper re-use. This is echoed by Bimal Tandukar writing from Cambodia for the case of agricultural use of sludge from rural toilets in this country.

WHY IS IT SO DIFFICULT TO ENFORCE GOOD NORMS &STANDARDS IN URBAN SANITATION? (BARRIERS)

Eddy Perez from the US mentions that enforcement is a critical and necessary part of safe faecal sludge management, but that in his experience unfortunately it's very rare to happen effectively. One of the barriers is the capacity of public servants to enforce. In his example of Jamaica,

sanitarians need better training and empowerment to be able to address illegal discharge by households into drains or even the ocean. The big difference with sanitarians in the US, is not only the training though, but also the fact that US sanitarians have the authority to shut down construction (of a house) in case sanitation doesn't comply with standards. Having this big stick as an ultimate consequence of non-compliant behaviour, works as a deterrent and provides credibility to other (softer) enforcement activities.

Chiranjibi Tiwari from Kenya writes that Water and Sewerage Companies (WSP, these are public companies) are mandated to ensure both water and sanitation services in their jurisdiction. However, the regulation of these WSP's has focussed on coverage targets, less on safety standards, collection, disposal and treatment. The regulating entity simply does not have the capacity to monitor those aspects.

Reuben also mentioned the capacity and expertise limitations of the local government to do proper monitoring. The problem is more in the capacity than in the lack of standards he says. Janina Murta from Australia agrees that there cannot be enforcement without information about compliance, and gathering that information continuously is costly. In the case of rural Cambodia, Bimal suggests that monitoring of sludge management could build on the commune level structures and their practice of ODF sanitation monitoring.

Possible starting points and process for working on smart enforcement

Some of the contributions suggested participatory, voluntary processes of gradually bringing emptiers into compliance with standards:

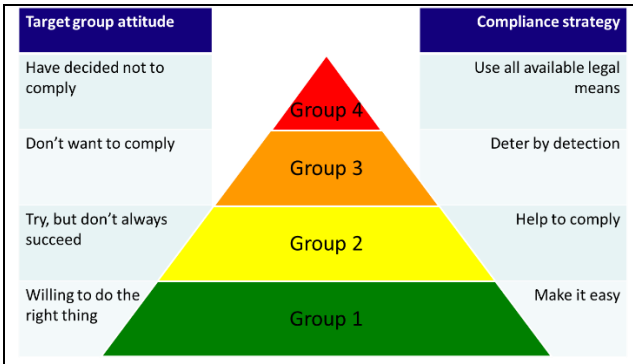
- Sanjay writes about the importance of first bringing emptiers together and understanding their issues in terms of pricing, disposal etc., improving communication with government, and then gradually through a hand holding process move towards greater compliance with standards. Er Abid Hussain also suggests technical support to the entrepreneur to gradually come into compliance with standards.
- Joanne provides an example from the tyre industry in Australia where the industry itself got organised and agreed on implementing quality standards among themselves. This form of "voluntary" compliance systems is an option when top-down systems are too difficult to implement. However, it was not a quick& easy fix. It took several years of co-design to set it up and also the threat of more heavy regulation by government, to get the industry to agree on this.
- Chiranjibi Tiwari is of this same line of thought: i) developing the standards in a participatory way, ii) legalising those standards with clearly defined roles and responsibilities of each actors, iii) communicating the norms and standards through effective channels, and iv) creating incentives (carrots/sticks) for consumers as well as service providers for the proper adoption. Janina further suggests that the emphasis should be on the carrots, in particular "name & praise" could create the right momentum.

However, there is a certain urgency in getting emptiers to comply with norms and standards, and going through a process of several years may be too much. There is an urgency to address the unhealthy environment where people are living, and proper FSM is part of that. The specific challenge in sanitation is that we need the vast majority to comply with norms and standards, in order to realise the benefits for all. That is not only for reducing open defecation, but also for sludge emptying services: one service provider who dumps the sludge in appropriately, affects health of the living environment even if all other service providers bring sludge to the treatment plant.

Moreover, there is always the question whether voluntary or participatory compliance systems will work in the end, in particular if there is no "big stick" in sight. For these reasons, some other contributors are less optimistic about voluntary compliance systems and encouragement only:

- Nadira suggests that –after getting the incentives right "smart economics"- there should be system of competition and licences for emptiers, and that in the case of no compliance, licences should be revoked.
- Similarly, Reuben points to the importance of building capacities and awareness of politicians, local authorities and staff at all levels to both understand the negative consequences of non-compliance, as well as measures to enforce. An important aspect in this is also the collaboration among ministries;
- Janina mentions that some form of monitoring will always be needed. A nice example is from Mozambique where citizens can report on issues with waste collection in their neighbourhoods using their mobile phones. While this type of monitoring cannot replace field inspections, it helps to get a greater inspection coverage a relatively low cost. Similarly, Bimal feels that the engagement of the lowest levels of government can bring down the burden of monitoring. He agrees with Nadira in getting incentives right first.

Finally, I would like to add that as long as sludge management is generally not seen as important by the general public, and there are no (strong) social norms against abusive behaviour, it will be very hard to enforce compliance standards. As I said in the introduction of this topic, at the moment, the enforcement pyramid for faecal sludge management is inverted, like the figure on the right (the size of each segment reflects the % of the population). This means that nobody really cares and many people feel it's OK not to comply.



General enforcement pyramid

Assumed FSM enforcement pyramid