Catalysts for change in urban sanitation

Proceedings of an Urban Sanitation and Hygiene for Health and Development (USHHD) learning event

Khulna, Bangladesh

4-7 December 2017

SNV

UTS Institute for Sustainable Futures

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This report documents the activities from the *Learning Event* held by SNV Netherlands Development Organisation together with Khulna City Corporation in Khulna, Bangladesh, from 4-7th December 2017, as part of the analysis, dissemination and learning component of its *Urban Sanitation and Hygiene for Health and Development* (USHHD) program. The event was attended by 35 participants from seven countries, and focused on Urban Sanitation: "*Catalysts for change*".

The report has been prepared by Freya Mills, Institute for Sustainable Futures, University of Technology Sydney, Australia. Assistance was provided by Francesca Tilmans (SNV Intern) and S.M. Tafsirul Islam (Khulna University of Engineering & Technology).

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ABBREVIATIONS AND DEFINITIONS

BCC	Behaviour Change Communication
CDC	Community Development Committee
DEWATS	Decentralised Wastewater Treatment System
D-Group	An online partnership of international development organisations that provides a platform for email exchanges. It currently has over 150,000 registered users and supports over 700 active communities of practice in international health and development (www.dgroups.info). The urban sanitation and hygiene D-group is managed by SNV and currently has 352 members from 46 countries. It can be joined at individual members can join by emailing: urbansan@dgroups.org
FS	Faecal sludge – contents emptied from onsite sanitation systems, or also a by-product of wastewater treatment.
FSM	Faecal Sludge Management
IRF	Institutional and Regulatory Framework for FSM in Bangladesh
KCC	Khulna City Corporation
KDA	Khulna Development Authority
KWASA	Khulna Water Supply and Sewerage Authority
NGO	Non-Government Organisation
OD	Open Defecation is the practice of people defecating outside and not into a designated toilet
ODF	Open defecation free is when all people in the village/commune use a toilet for defecating.
OHS	Occupational Health Safety
O&M	Operation and Maintenance
PPE	Personal Protective Equipment
PPP	Public Private Partnership
Sanitation	Sanitation in this learning event is defined as human waste management, not solid waste or drainage.
USHHD	Urban Sanitation and Hygiene for Health and Development, SNV's urban sanitation program
WaterAid	International NGO
WSUP	Water and Sanitation for the Urban Poor, International NGO
Vacutug	Simple portable machine that is used to extract human excreta from on-site sanitation.

INTRODUCTION

This report provides a synthesis of the Urban Sanitation Learning Event on Catalysts for Change held in Khulna Bangladesh from the 4-7th December 2017. The learning event was organised by SNV together with Khulna City Corporation and with funding from the Bill & Melinda Gates Foundation as part of SNV's Bangladesh Faecal Sludge Management (FSM) Program.

The purpose of this report is to provide a reference for participants as well as other practitioners, managers, local government and other actors involved in SNV's Urban Sanitation and Hygiene for Health and Development (USHHD) program. It aims to capture the key content presented by experts, sanitation status and challenges from the participants' countries, as well as key discussions and reflections. It is hoped that this report will also serve as a resource for the broader WASH sector.

Background to USHHD

This Learning Event was conducted as part of SNV's USHHD program, which aims to improved health and quality of life of men and women through access to sustainable and environmentally safe sanitation and improved hygiene practices. The programme aims to build capacity for environmentally safe sanitation and hygiene practices and sustainable city-wide sanitation services that address the entire chain of human waste, working with the responsible local governments and a broad range of other stakeholders at national, district and sub-district levels. The USHHD program is currently implemented in Bangladesh, Indonesia, Nepal, Tanzania and Zambia, including 19 cities with approximately 5 million people. The USSHD program and includes the following five key components:

1. Sanitation Behaviour Change Communication (BCC) and awareness
2. Safe and affordable sanitation services
3. WASH governance, regulation and enforcement
4. Smart finance and investment
5. Treatment, disposal and re-use

These components are interlinked and addressed systemically, and are supported by a cross-cutting sixth component of knowledge management and learning. The objective is to improve performance and contribute to national and global learning around urban sanitation. This includes monitoring and feedback to improve city programs, local and national learning and reflection, and cross-country learning and participation in international platforms to document and share best sanitation and hygiene practices both within SNV, with clients and broader networks.

This learning event on 'catalysts for change in urban sanitation' and the preceding D-group on the same topic, enable the exchange of ideas and to deepen our understanding of change processes in urban sanitation. The learning component of the USSHD program is supported by the Institute for Sustainable Futures at the University of Technology Sydney (ISF-UTS).

This event follows from previous urban sanitation learning events in:

- 2013 Lampung, Indonesia: Urban sanitation - Citywide Planning and Financing.
- 2014 Khulna, Bangladesh: Urban Upgrading and Emptying of On-site Facilities.
- 2015 Manila, Philippines: Urban Sanitation – Professionalization of sludge emptying services.

Introduction to the Learning Event 2017

The 2017 Learning Event focused on "Catalysts for change in urban sanitation" and was held in Khulna, Bangladesh with over 40 participants from SNV program countries of Bangladesh, Indonesia, Nepal, Tanzania and Zambia. Participants were from local and national government, local water authorities, community organisations, partner NGOs and Universities, SNV country and headquarter staff and an external participant from IPE Global and ISF-UTS.

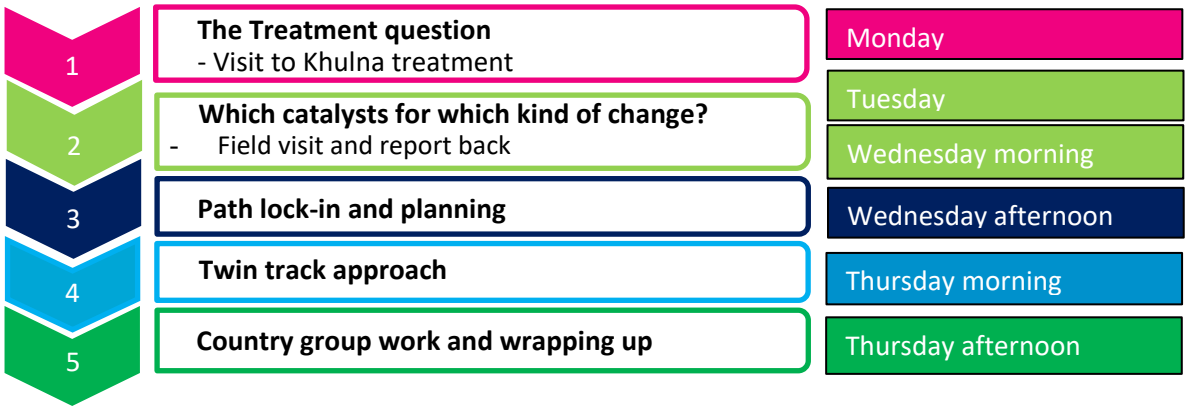
Day 1 - Presentation by Antoinette Kome, Learning Event Facilitator and SNV's Global Sector Coordinator WASH

The intention of the learning activity was to exchange ideas and deepen our understanding of **catalysts or entry points for change** with respect to citywide sanitation services. The aim of this learning event was not to instruct about which catalyst to use or specific entry point to follow, but to continuously improve and strengthen our approach to urban sanitation. Through sharing the experience from various countries, you can familiarise and evaluate different examples of catalysts and reflect on their outcomes and sustainability and application in each country's context.

The objective of the learning event was to explore how we make decisions regarding urban sanitation, including:

- Zooming out: looking at the whole picture and the change process to citywide services.
- Thinking about different entry points for change: treatment, data, services, planning
- Considering mixed situations: sewer, DEWATs and FSM
- What would be the best fit for own cities and how to achieve citywide inclusive sanitation?

The learning event was arranged into five learning blocks:



Official Opening

The Mayor of Khulna City Corporation (KCC), as co-host of the Learning Event, was invited to open the learning event, with Khulna University Vice Chancellor and the SNV-Bangladesh Country Director.

Opening address by Md. Moniruzzaman Moni Honourable Mayor Khulna City Corporation

- Reflected on the scale of the challenge when he first realized the need for FSM and need to improve the environment.
- Reinforced that KCC are putting in all efforts to succeed in achieving improved FSM.
- Thanked participants for coming to Khulna to share their experiences and wished a successful event.

Opening address by Prof. Dr. Muhammed Alamgir Vice Chancellor Khulna University of Engineering and Technology

- Thanked the friends from Nepal, Tanzania, Indonesia, Zambia for visiting Khulna.
- Grateful for SNV's support for sanitation in Khulna since 2014 and that a lot has been achieved to raise the awareness for sanitation and understanding the challenges to improvement.
- Highlighted the need to improve FSM in Khulna, a higher priority than drainage, water or solid waste.
- Despite achievements in ODF, Bangladesh needs to now improve on-site sanitation, sanitation and hygiene habits and FSM services.
- Reinforced the need for stakeholder participation to achieve success but that the overall responsibility to improve sanitation was the city government.
- Expressed that there was not one single catalyst but it must depend on the goals and objectives, such as: behaviour change, toilet and septic tank design, financial or legal aspects. Then the catalysts can be decided such as logistic or human resource support.

Opening Remarks by Mr. Jason Belanger, Country Director SNV Bangladesh

- Welcomed all, and thanked guests and all participants for travelling to be part of the learning event.
- Reinforced the critical issue of FSM in Bangladesh and despite the country's success and pride in reducing OD to 1%, it should be recognized that benefits are diminished if there is a lack of containment and treatment.
- This learning event can highlight the progress that is being made in these cities and be a catalyst for change for FSM in Bangladesh.

Expectations of Participants by Country

Participants from each country introduced themselves and shared their expectations of the Learning Event, as summarised below. The participant list is included in Appendix I.



Country	Expectations
Bangladesh	• Share examples especially on private sector engagement and national framework • Receive feedback and ideas on how to improve practices from other countries • Learn ideas for increasing demand and behaviour change
Indonesia	• Share ideas about how to improve onsite sanitation systems and financing arrangements • Learn about different approaches to private sector engagement • Currently developing national framework so motivated to learn about the process in Bangladesh and what aspects to consider
Nepal	• Since Jumla was recently recognised a city rather than rural district, the team were motivated to learn more about urban sanitation approaches and challenges. • Learn how to address the needs of both urban and more rural/peri-urban areas.
Tanzania	• Urban sanitation is a new program for SNV Tanzania and the team is eager to learn what can be possible in the 5-year program.

Country	Expectations
	• Motivated about the success of Khulna's local government involvement and stakeholder collaboration. • How to mainstream urban sanitation into policies
Zambia	• Team has recently started the urban sanitation program and excited to learn from the impressive progress of Bangladesh and how it can be applied in Zambia. • Particularly interested in the processes involved in setting up FSM, involving private sector and key principles for triggering awareness and behaviour change.
India	• Share ideas from application of GIS to support urban sanitation planning in Rajasthan and learn from other countries

BLOCK I: THE TREATMENT QUESTION

OVERVIEW OF BLOCK I: THE TREATMENT QUESTION

Why is this relevant?

We all recognise that urban sanitation is a problem and often constructing a treatment plant is thought to be the first priority to address this. Decisions on the type and size of treatment can be based on the city's short-term or long-term needs, different scales, discharge requirements, capacity to operate, cost and reuse potential. Often securing land and finance for a large-scale treatment may take time or risk being considered too difficult, which risks halting any progress in sanitation.

This block therefore looked into the decision-making process in the selection of treatment (from a planning rather than technical perspective), while Block II then considered whether there are alternative starting points to treatment to catalyse change.

Khulna provides a valuable example of finding treatment solutions for both short term and long-term needs, as well as highlighting the important decisions and stakeholder consultation that went into the development of FS treatment for the city.

What knowledge and learning outcomes were intended from this block?

- To recognise that long-term large-scale treatment isn't always the necessary entry point
- To understand the options regarding treatment scale and complexity
- To contemplate the chicken and egg conundrum: Whether treatment or services comes first?

What was the process?

a) In country teams (3 for Bangladesh), discuss existing treatment systems in each country/city, the design process and alignment of the treatment with the city's future needs and vision.
b) Visit Khulna faecal sludge treatment plant

1.1 Introduction to Block I

DAY 1 - Presentation by Antoinette Kome, Learning Event Facilitator

Although we've long known that building toilets is only one step in achieving improved sanitation, the Sustainable Development Goals now recognise this by included "safely managed sanitation" as the highest level on the sanitation ladder.

We are a long way off achieving universal safely managed sanitation, with the 2017 Joint Monitoring Program report highlighting that:[1]

- *Only 2 out of 5 people used safely managed sanitation in 2015; and*
- *Only 27% of world's population used private sanitation facilities connected to sewers from which wastewater was treated.*

Building a treatment plant is often considered the starting point in addressing this poor status of urban sanitation. While in Block II we discuss alternative entry points, the aim of this block is to reflect on the critical questions in planning and deciding on treatment plant solutions to ensure adequate consideration the local conditions and preferences, in particular:

- Availability of land in a suitable location
- Preference for post treatment (disposal or reuse) and any drivers for resource recovery drivers
- National environmental/disposal standards (ie. in India the standard for BOD is 10mg/L which is difficult to achieve with low-tech or natural treatment systems)
- Designing for short-term need or long-term capacity
- Potential for Public Private Partnership (PPP) models for construction and management
- Ongoing operation and maintenance responsibility, finance and skills or capacity.

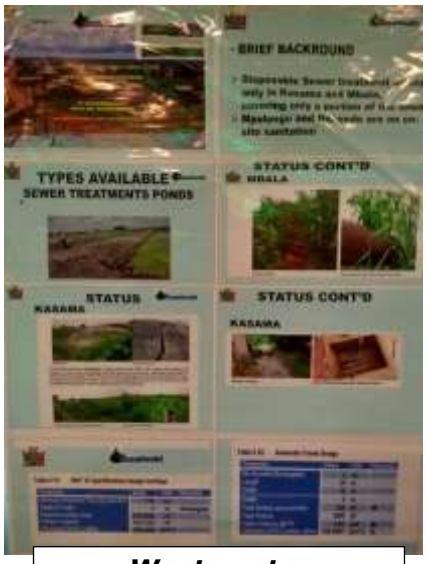
Another important aspect is the consideration of the service availability (FS emptying or sewers) and demand for treatment, both the current status and expected growth. As was discussed in previous learning events (2014 and 2015), FS emptying services are often inadequate and improving them takes times.

[1] WHO/UNICEF, "Joint Monitoring Report 2017 Update: Progress on drinking water, sanitation and hygiene", World Health Organisation. Available at https://washdata.org/

1.2 Sharing country perspectives on treatment

To understand the context and status of treatment in each country, participants split into country groups and discussed the following questions regarding their existing treatment:

1. What is the type of treatment and capacity in each city
2. What are the ownership and O&M arrangements?
3. Which design and set-up choices were made?
4. How does this treatment align with the city's ambition and future needs?



Wastewater treatment in Zambia

Table 1 – The Treatment Question: country responses

Country, City	Type of treatment and capacity	Ownership and O&M arrangement	Design and set-up rationale	Alignment with the city's vision and needs
Bangladesh: Kushtia	Pilot FS treatment - drying bed, cocopeat filter and polishing pond with 9m^3/d capacity. Co-composting of dried sludge and solid waste for reuse.	Municipality operates treatment and private operator of co-compost facility	- Low cost and easy to operate - No external energy use - Business opportunity with composting.	- Meets city's objective of a healthy city and to reduce environmental pollution, and promote business development. - While treatment capacity is below the city's long-term needs, current emptying rates are low. - For sustainable O&M, government needs to increase staff and their capacity
Bangladesh: Jhenaidah	Planted drying bed 45m^3/d for both FS and percolate. No reuse, treated water into the canal so no polishing pond.	Municipality owns and NGO operates	- Low cost and easy to operate - No external energy use, environmentally friendly	- Benefits from private sector partnerships as the government does not currently have capacity to operate the treatment
Bangladesh: Shakhipur	FS drying beds for solids with co-compost including solid waste. Liquid is treated in a constructed wetland built in 2016 and reused in agriculture.	Municipality owns land, operated by an NGO, WaterAid provides technical support	- Environmentally friendly with reuse and no external energy. - Low O&M requirements	- Current use is low, therefore increasing emptying demand is needed - Improving OH&S practices is also a priority for the city
Bangladesh Faridpur	FS drying bed (planted and unplanted), liquid treated in a stabilisation pond and solids by co-composting. Sized for 24m^3/d.	Municipality owns and private company leases for operation.	- Low cost, - Simple to operate, - No external energy,	- Treatment is adequate however need to increase emptying frequency and capacity of emptying trucks.

Country, City	Type of treatment and capacity	Ownership and O&M arrangement	Design and set-up rationale	Alignment with the city's vision and needs
Indonesia: National	A study in 2012 found less than 10% of 150 sludge treatment plants built in 1990's were operational. Systems are mostly Imhoff tanks or settling chamber followed by sludge drying bed and settling ponds.	Constructed by National government and handed over to local government for O&M. Handover is often difficult and slow.	Ministry of Public Works has standardised designs with minor modifications for local conditions.	- Upcoming FSM Framework will have a greater focus on the entire service chain rather than just treatment. Investment will prioritise cities developing FS services. - Developing criteria regarding investment decisions between upgrading or rehabilitating existing plants or building new treatment.
Nepal: Jumla	Currently no treatment plant in Jumla, FS is dumped in forest. Six wastewater treatment plants in the capital Kathmandu and a number of DEWATS.	No treatment therefore no O&M	- Needs to treat wet sludge from large holding tanks and solid sludge from peri-urban leaking containment systems. - Due to difficulty of finding land and low public acceptance, government is considering a short-term solution such as trenching.	- Recently classified as a city, government plans to improve FSM and need a treatment plant. - To increase emptying government will promote improved septic tanks with access, as current holding tanks are too large and difficult to empty.
Tanzania: Arusha City	Waste Stabilisation Ponds (WSP), for wastewater treatment were built in the 1960's, and serve approximately 7% of the city.	Water Supply and Sanitation Authority operates	Old system so decisions unknown but expect WSP was chosen due to availability of land and efficiency of treatment for the population size.	2017-2025 master plan proposes to redesign the WSP to include drying beds and increase population served to 30%.

Country, City	Type of treatment and capacity	Ownership and O&M arrangement	Design and set-up rationale	Alignment with the city's vision and needs
Zambia:	Kabne, Kasana and Mbala have wastewater treatment plants (oxidation ponds) build many years ago when they were mining towns.	City owns and the commercial utility operates.	Treatment plants are old, so decisions unknown. However, expect ponds were chosen due to ease of operation and previous availability of land.	- While plans exist for sewerage, there is no clear planning or policy for FSM. - Some treatment plants are dilapidated and need repair or complete rehabilitation

Q&A

Q: Why are the faecal sludge treatment plants in Indonesia not working?

A: Key reasons that a number of plants fell into disrepair was due to unclear responsibility for FSM, including ultimate ownership or operation and maintenance of the plant. This was a particular issue for plants where the handover from National to Local government was slow (can take up to five years) or due to construction/quality issues. In addition, when these plants were built in the 1990's there was not a focus on the service delivery aspect like there is today, therefore sludge inflows were low. Inflows much lower than design can cause issues in the system such as sludge solidification in the inlet chamber or blockage of pipes due to low flows. Although these are low technology systems, some level of operation and maintenance is still required.

Q: How have different countries achieved compliance with discharge standards or enforcement of quality?

A: In Bangladesh there are regulations from national government that effluent must comply with local treatment standards. In Indonesia the local office of the Ministry of Environment is responsible for enforcing the effluent standard, although not always proactive in monitoring.

Q: How are households paying for treatment?

A: In Bangladesh every household connected to sewer pays the same as the water bill, there is no commercial/residential segregation, however the cost is reduced by 50% for the poor. In Zambia there is a sanitation tax charged to all households, based on 25-35% of water bill depending on the property type.

1.3 Faecal Sludge Treatment Field Visit

DAY 1 **-** On the Monday afternoon, all participants visited the recently constructed faecal sludge treatment plant in Khulna.

1.3.1 Background on Faecal Sludge Disposal in Khulna

Prior to 2014 there was not a faecal sludge disposal site in Khulna, therefore SNV has been working with KCC over the past three years to develop disposal options so that the benefits of improved emptying are not limited by unsafe disposal. There have been three types of disposal developed in Khulna in the recent years highlighting the range of possible options for short- and long-term treatment solutions suitable for the conditions and government preferences in Khulna:

1. **Trenches for dumping sludge:** Initially built after KCC staff visited Malaysia and saw there use of trenching. Recognising the immediate need for a safe disposal site, with the support of SNV, trenches were built in 2014 which were used until the wetland was built.
2. **Constructed Wetland**: Designed with a max capacity of 180m^3/d, this treatment was commissioned in March 2017, supported by the Bill & Melinda Gates Foundation. The system was designed in consultation with KCC who chose this type of treatment from a range presented options based on its low cost and decision not to reuse sludge.
3. **Sludge drying bed:** A pilot treatment sized for 18m^3/d inflow sludge was built to enable the trialling of sludge reuse after KCC saw the success in other Bangladesh cities. A small sludge drying bed was built, from which the effluent is connected to the horizontal flow wetland.

These three disposal options were located at an old solid waste landfill site about 9km from with city with an area of 1.3 acres.

1.3.2 Design – Khulna FS treatment with constructed wetlands

The treatment has a capacity of 180m^3/d and was designed to serve 13% of the city's population (1.5 million people), designed on the assumption that emptying occurs every 3 years by a septage truck with 1m^3 capacity.

As shown in the figures below, the treatment follows the following process:

1. **Vertical flow wetlands:** Six wetlands in parallel, each loaded from an individual inlet chamber and network of pipes that distributes flows onto the wetland's surface. The wetlands are raised and contained by bunds (rather than dug into the ground) to enable gravity flow across the system. The six wetlands are designed to be loaded one at a time and allowed to dry for 2 weeks before loading again, with sludge accumulating on the surface and requiring removal every seven years. The system is filled with gravel layers of varying sizes and is planted with Heliconia, Cyperus, and Cannas plants.
2. **Horizontal flow wetlands:** Two wetlands in series for treatment of liquid fraction that drains from the constructed wetland and sludge drying bed. The systems are filled with range of gravel and shredded plastic bottles and planted with Heliconia, Cannas, Padanus palm and Lotus.
3. **Polishing Pond:** With fish which discharges to the river/swamp behind the property. The outlet is fitted with a non-return value since the river/swamp level increases during rainy season.

The treatment cost BDT 17million (USD 210,000), although the additional earthwork to raise the road, guard house and arrangement of security facilities are not included in this price.

Figure: Vertical flow wetland (top), horizontal flow wetland (bottom left), polishing pond (bottom right)

1.3.3 Challenges with the treatment design and operation

Rajeev Munankami, Senior Advisor & Programme Leader FSM SNV Bangladesh, presented a number of challenges that were faced during the construction and operation that could inform future treatment design and planning.

- **Groundwater protection:** As the site was an old landfill, it was necessary to restrict seepage into the groundwater which would transport contaminants. Therefore, the wetlands were fully lined with geofabric, a special impermeable plastic (HDPE) sheet. While the geofabric was already available in Bangladesh, there were delays in its supply which delayed the project. Recently a number of holes have been found, possibly due to rodents, these are being fixed and a solution investigated.
- **Low demand:** In comparison with the capacity of 180m^3/d, there is currently only around 7m^3/d discharged to the treatment. To minimise blockage and issues with low flow, only half of the wetland beds are currently in use. SNV has been working in parallel to increase emptying and delivery to the treatment plant and proactively monitoring the plant operation to limit issues with low flow.
- **Inlet chamber:** There are three key challenges with the inlet system:

  1) **Truck discharge:** although it was expected that trucks could pump sludge up into the raised inlet tank, this was not possible and therefore ramps are being built to all inlets to allow gravity discharge. This requires significant earthworks which is costly.
  2) **Change in truck capacity:** The inlet pipes distributing flows were designed based the 1m^3 emptying truck, however since construction KCC now use a 7m^3 truck, therefore discharging much large flow volumes. The pipes and inlet chamber are too small for this increase flow and either the flow or chamber will need to be increased.
  3) **Screen:** The screen/grate in the inlet chamber has very narrow spacing and therefore with the high flows (issue 2) and presence of rubbish in many pits (plastics, wrappers, menstrual hygiene products), the screen it is not used as it causes flow to back up. A broader screen (50mm spacing) or larger inlet chamber could improve its function.
- **Sludge drying bed:** The surface layer was originally sand to prevent blocking the filter media, however when sludge was removed sand was also collected which reduced its reuse quality. On top of sand layer unsealed bricks have been layed which have proven much easier to remove sludge while still draining well.

Key Treatment Considerations:

- A number of treatment types are possible and these can be built in phases depending on the current needs and budget available.
- Khulna's faecal sludge treatment is a successful example of a low-maintenance treatment that achieves discharge standards.

- While it is economical to build a treatment plant for long term capacity, this may be much too large for current demand and options for a modular construction could be considered. Otherwise as is done in Khulna, the operation should be modified to optimise treatment for low flows.
- It is important to plan for change, as there is potential for input assumptions to change, including: inflow volume and characteristics, truck capacity and type, demand for reuse, etc.

BLOCK II: WHICH CATALYSTS FOR WHICH CHANGE

OVERVIEW OF BLOCK 2: WHICH CATALYSTS FOR WHICH CHANGE

Why is this relevant?

In many cities there are often numerous and varied aspects of urban sanitation that need to be improved and it is often difficult to know where to start. At the same time, it is important to recognise how the entry point, both the activity and the stakeholders involved, can influence how stakeholders understand urban sanitation and the type of change that is required.

This block therefore discusses alternative entry points to progressing urban sanitation and built from the D-Group discussions prior to the conference. This block was grounded with practical examples of different entry points through field visits to expose participants to different approaches to urban sanitation and consider the suitability of different entry points. These included: co-composting treatment, improving emptying, focusing on slum areas and data management.

What knowledge and learning outcomes were intended from this block?

- To understand the different possible catalyst for change in urban sanitation
- To consider the influence on different stakeholders
- To be exposed to different approaches to progressing sanitation
- To reflect on the suitability of these approaches as entry points for change in other cities



What was the process?

- Online D-Group discussion prior to learning event
- Participants split into four groups to visit different urban sanitation projects and meet stakeholders in Khulna and Faridpur.
- Participants presented their findings and recommendations from the field visits to a panel of Bangladesh representatives.
- Responses from the panel local government representatives invited to hear the presentations

2.1 Entry points for change

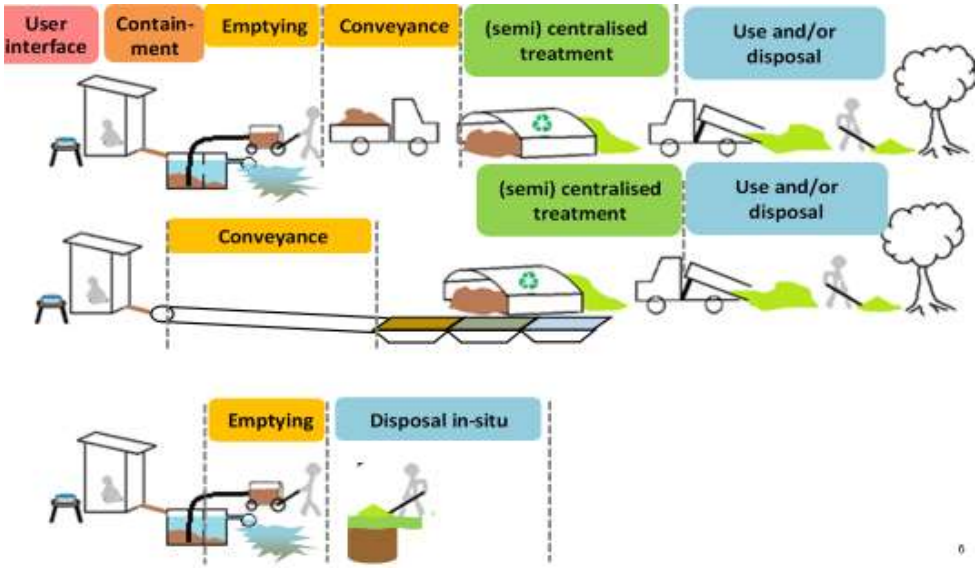
DAY 1 - Presentation by Antoinette Kome, Learning Event Facilitator

While in Block I we looked at the often-assumed necessary starting point to develop urban sanitation: "first built a treatment plant". In Block II the aim was to highlight that there are many different catalysts to trigger change.

Firstly, it is important to revisit what we mean by **citywide sanitation**, which includes:

1. **All geographic areas:** such as all wards, neighbourhoods, peri-urban areas.
2. **All types of premises and people:** not limited to residential but also education, institutional, health facilities, commercial, public places, etc.; and all types of city dwellers: rich, poor, land owner, tenants, homeless, etc.
3. **Across the entire sanitation value chain:** Considering the containment, emptying, conveyance, treatment, disposal and reuse (Figure below)

Sanitation Service chain



Often, we are ideologically inspired and may think that there is only one pathway that can solve our sanitation challenge:

- *Technology optimism only* – assume that reinventing the toilet will solve all problems
- *Business optimism only* – assume that private sector can take up all responsibilities and finance
- *Municipality optimism* – the contrast, assuming that by owning infrastructure, providing service and oversight of their own work, the municipality alone can solve the challenge
- *Civil society alone optimism* – relying on public motivation and community management

Entry Points for city sanitation improvements:

Prior to the learning event the following questions were proposed to the D-group:

- What were the entry points or first activities for your city's sanitation improvement?
- How did this influence the way stakeholders saw change?
- Which building blocks did it create for city-wide sanitation services?

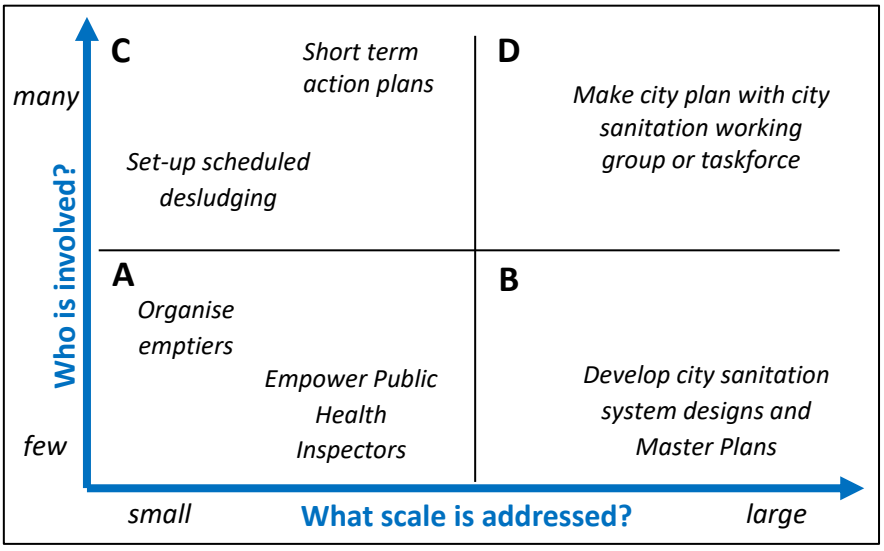
From the broad ranging discussion, the key entry points could be grouped on two axes (see Figure below):

i. **What scale was address?** Small (e.g. specific issue) to large (e.g. citywide).
ii. **Who was involved?** Few (e.g. select group) or all (e.g. broad stakeholders group).

Some examples of entry points from the D-group relevant to the four quadrants include:

A. Specific issues tackled by a small group: For example, in Zambia public health inspectors (a specific group) were empowered first on ODF (specific issue) then on other specific issues.
B. Specific group looks at the whole city: In many countries a small group of experts (usually consultants), or in Zambia the utility, developed a citywide sanitation master plan.
C. Broad group tackles a specific issue: In Khulna Bangladesh, a broad stakeholder group worked together to develop scheduled desludging (specific issue) which in time progressed to other FSM issues (towards quadrant D)
D. Broad group looking at the whole city: Example from Indonesia where a broad stakeholder working group develops a city sanitation strategy.

Four quadrants of sanitation entry points



Building blocks and recommendations

The second point discussed by the D-Group were the building blocks and recommendations for triggering change, some of their suggestions included:

- Creating eye-openers, or leverage improvement examples from other cities
- Understanding the city sanitation situation or status (baseline study)
- Be clear about the city's specific short-term needs. However, have a longer-term vision and plan
- Mobilization of existing actors and structures
- Clarify roles and responsibilities and ensure adequate capacity and resources
- Create or strengthen the city sanitation working group or taskforce

From the D-group discussion it was evident that there are different entry points and strategies that depend on the context. In addition, where we start influences how stakeholders understand urban sanitation and the type of change that is required. There were examples that illustrated when change started with a broad group of stakeholders to develop a city sanitation plan, the resulting discussions may be very abstract discussion if the stakeholders don't have a strong understanding about sanitation.

However, when action started with a small group, there could be the risk that broader stakeholders perceived the responsibility for sanitation was limited to that small group. Or when starting with a specific activity, it may be unclear how it fits into a broader citywide plan or citywide needs. It was hoped that through the field visits and discussions, participants would understand the benefits and challenges for each approach and think strategically about what is best for each context.

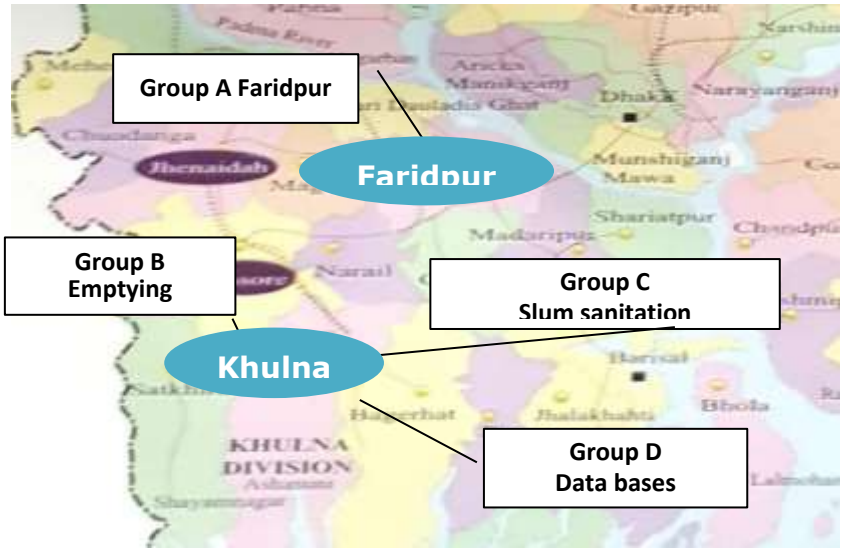
2.2 Field assignment – Examples of the process of change

DAY 2 – Introduction to Field Visit by Antoinette Kome, Learning Event Facilitator

The objective of the field visit was to expose participants to the experiences in developing urban sanitation in southern Bangladesh and to reflect on what it means for moving towards citywide services and to what extent these examples are suitable entry points for change.

Participants were divided into four mixed country groups for field visits on Tuesday 5th December. Group A visited Faridpur a municipality 150km north of Khulna, while the other groups remained in Khulna and visited sites with different entry points:

- Group A: Co-composting and public-private partnerships in Faridpur municipality.
- Group B: Emptying and demand creation by Khulna City Corporation, KCC Health Department and the Community Development Committee.
- Group C: Focus on sanitation in slum areas in Khulna.
- Group D: Database integration between different government agencies in Khulna.



The groups were required to report back on their field visits by preparing the following:

- A powerpoint presentation
- A photo diary
- A testimony of a person associated with the pit emptying services
- A 2-page case study

The presentation would include key findings and recommendations from the field visit to be presented to a panel of local government representatives from Khulna City Corporation and Khulna Water and Sewerage Authority on the Wednesday morning. While the other outputs would be shared with fellow participants and the broader D-Group community.

2.3 Case study reports from field assignment

DAY 3 – Presentation of field visit by each participant group to a panel

On Wednesday 6th December each group presented a summary of the key insights from their field visit as well as recommendations to the panel of local government and water authority representatives. Included below are extracts from each groups presentation and the panels response and other audience questions.

Field Visit Group A: Faridpur

Background

Faridpur is a municipality located 3 hours north of Khulna with a population of approximately 150,000. The municipality will soon double in size as it's status will become a City Corporation. The majority of households use onsite sanitation systems (94% in 2014), however only 10% of sludge was safely managed, with 53% of systems discharging to drains, 17% to waterways and 20% not known.

Faridpur municipality have been developing FSM since 2008 in partnership with Practical Action, also supported by Water Aid and the Bill & Melinda Gates Foundation in recent years. Since 2014, Faridpur Municipality have been working on a comprehensive approach to ensure city-wide FSM by 2025, which has included a situational analysis, development of an inclusive business model and a private partnership for treatment.

Sites visited and key insights

- **Meeting with Faridpur Municipality:** The city has a vision of clean and green city. Achievements to date include: municipality commitment and leadership for citywide sanitation; an increase demand for emptying and disposal; and supported the establishment of two emptying cooperatives.
- **Watched the process of sludge emptying:** Participants followed one of the pit emptying companies through the phases of emptying from the septic tank, sludge transport and treatment.
- **Visited the sludge co-composting treatment plant:** This organic waste and FS treatment is operated by an NGO with a capacity of 24m^3/d, sufficient for 28% of the city.
- **Meeting with city emptying cooperative:** One of two cooperatives to coordinate pit emptiers.



Identified key entry points for change

1. Multi stakeholder steering committee: Chaired by the municipality this group ensure the participation and inclusion of different stakeholders, including representatives from government, pit emptiers and civil society. It has supported the emptier cooperatives with equipment and monitoring quality. However there were concerns that many emptiers were excluded and their inclusion in decision making was uncertain.

2. FSM service centre and online management system: This is a website where people can register their demand for emptying; records data on demand and finances; tracks and records when the emptying job is complete and where sludge is dumped. Customers can also demand emptying by phone or visiting the municipality. However, the database excludes manual emptiers and at this stage is only used for management and not for marketing.

Field Visit Group A: Faridpur

3. Emptier cooperatives: Pit emptiers enter a two-year contract in which they pay a monthly fee to lease the vacutug from the cooperative. The cooperative is responsible for regular maintenance (under 5000) and the municipal is responsible for major maintenance (over 5000). The emptying tariff is set with a different charge for poor and commercial properties. The municipality provided personal protective equipment (PPE) and occupational health and safety (OHS) training to emptiers however, it was evident that PPE is not often used and regular health checks could also be provided to the workers.

4. Co-composting treatment: Faridpur municipality have signed a contract with an NGO to co-treat sludge in their existing organic fertilizer plant. Faridpur's proposed emptying business model has a focus on reuse as fertiliser to improve the financial viability. The treatment design included a greenhouse to accelerate drying and raising the land to allow gravity flow. However, the effluent may not be adequately treated for removal of nutrients and pathogens. While the current demand is low and a mobilisation campaign is underway.



Questions from Panel/Audience:

Q: *Is the co-composting working well and is it financial viable? What kind of assistance does the municipality give (marketing, testing)?*
A: While the business model was developed based on a profit model (considering staff costs, monitoring and laboratory testing, licencing, packaging), the actual operating costs haven't been assessed. Since the sludge input is much lower than design, is unlikely that costs are recovered at this stage. The NGO gets support from the municipality and Practical Action in business expansion, capacity building and other support with training.

Q: *What is the capacity and design of the system?*
A: The design was based on land availability and existing equipment of two $2m^3$ trucks. The capacity of $24m^3/d$ will serve about 30% of the population, however it currently only receives 6-$8m^3$/day. A demand creation campaign will be implemented however it is recognised that increasing demand will take time.

Field Visit Group B: Sludge emptying services and demand creation

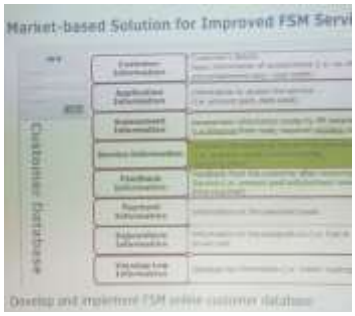
Background

Khulna city is the third largest city in Bangladesh with a population of 1.5 million and density of 32,900/km^2. There are multiple agencies responsible for sanitation in Khulna:

a) Khulna City Corporation (KCC) responsible for ensuring better services and living standards, including sanitation services (FSM).
b) Khulna water supply and sewerage authority (KWASA) are mandated to supply both water and sanitation facilities but focus on water.
c) Khulna Development Authority (KDA) are responsible for planning development and approval of building designs including septic tanks.

Sites visited and key insights

The focus of this field visit was to understand the roles of different institutions in the provision of FSM services in Khulna city. The group met with multiple services providers and stakeholders to discuss the different roles, responsibilities and coordination, while also watching KCC empty a septic tank.



- **KCC conservancy department:** Discussed the different management arrangement and responsibilities of the three emptying service providers.
  1. KCC: Major service provider with two vacuum tankers 5m^3 and 7m^3 capacity.
  2. Community Development Committee (CDC): Operate three 1m^3 vacutugs in three city zones.
  3. Manual emptiers: Hundreds independent emptiers.

  KCC, with the support of SNV, have developed an OHS manual and trained 141 emptiers in safe emptying practices and 16 emptiers in entrepreneurship. In addition, following a review of different business models, KCC increased the price of emptying to make the business more viable and will soon release a tender for emptying services, hoping to encourage private sector to enter the market. They reported challenges in treatment plant operation due to low emptying rates and also high operating costs due to the large distance to dispose to the treatment plant (9km).

- **Desludging of one household:** Watching KCC empty one septic tank, the group noticed that there was little adherence to the OHS guidelines, with no use of protective clothing or cleaning of spills.

Field Visit Group B: Sludge emptying services and demand creation

- **KCC garage** where vacutugs and other equipment are kept and serviced.
- **KCC health department:** Recently implemented a behaviour change campaign to motivate regular emptying. The campaign involved different communication methods were used (competitions, sms, billboards, movies, letters) and messages were based on the findings of SNVs baseline research and developed with a large group of city stakeholders. While it is too early to assess the effectiveness, the first month saw a tripling in emptying demand.
- **Federation of the Community development committees (CDC):** CDC's were developed from a UNDP program with a focus on community leadership, livelihoods and empowerment of women. While CDC focus on community support they also provide FSM emptying, mostly to low income areas, who pay a lower fee for emptying and occasionally are unable to pay. In addition to the reduced income serving poorer areas, CDC face difficulties with truck maintenance, the long distance and cost to deliver to the treatment plant, and low demand for service with many households choosing cheaper manual emptiers. CDC recently received a seed fund of USD 50,000 to support sanitation entrepreneurship amongst its members. Loans have so far focused on production of concrete ring pits and semi-mechanical emptying equipment. While CDC are happy to expand their role in providing emptying services, they were unclear of whether they can bid for KCCs emptying contract.

Recommendations:

1. **Improve OHS:** While KCC reported emptiers have been trained in OHS, it was not followed during the emptying viewed by the team. It is recommended that KCC provide additional training and encouragement of their emptiers to use PPE. For CDC or private emptiers, it could be possible develop a service agreement and regular audits to monitor improved OHS performance.
2. **Review KCC's role:** The team suggested it could be more suitable for KCC to take on the role of regulator to enforce rules and manage finances, with other organisations providing the service. KCC could also manage a sustained BCC campaign, collect and manage data on containment systems and emptying; and ensure sustainable financing of operation, maintenance and replacement costs.
3. **KCC support CDC service provision in low income areas:** As KCC empties larger and commercial properties with a higher emptying service fee and CDC provides in lower income areas with a reduced fee and many defaulting, KCC could consider cross subsiding or financial support to CDC.
4. **KDA** should finalise the septic tank design and incorporate it into building codes

Questions from Panel/Audience:

Q –What is the reason for KCC tendering a contract for emptying to new private sector when there are already many service providers?

A- KCC may perceive CDC to be a part of their operations and not see them as a formal specific emptying provider. In additional they may question the capacity of CDC for taking on a greater role in emptying when their focus is community empowerment.

Field Visit Group C: Sanitation in low-income communities

Background

Bangladesh's growing slum population presents a complex environmental and health challenge. Due to rapid urbanisation and rural-urban migration, nearly one third of the total urban population are residing in slum and squatter settlements in cities of Bangladesh. In Khulna 50% of households are classified as extremely poor.
To improve the urban health and living environment of the urban poor, basic services are being extended to slum areas of Khulna city, which includes provision of water supply and sanitation. SNV and other NGOs (WaterAid, Nabolok) have been working with KCC to improve sanitation in urban slums.

Sites visited and key insights

- **Public toilet:** Located in Notun Rastar Mor, Khalishpur near a bus stop and market the toilet was built and is owned by KCC with funding from Asian Development Bank. It is leased to an enterprise for operation and maintenance who pay for water, electricity, cleaning materials and minor maintenance, while the KCC is responsible for pit emptying. The operator reported the usage was low (30-40 users/day) as this toilet cost 3-10 BDT while there was a free toilet at the nearby petrol station. In addition, she reported there were few women users and some local residents refuse to pay. Another challenge is the septic tank (possibly a holding tank since no visible outlet) fills and overflows regularly. While it is emptied by KCC annually, it is requires emptying every 3 months, therefore the enterprise pays manual emptiers (sweepers) to empty who dump sludge/liquid into the adjacent drain.

Communal Toilet: Built in Joragate Koiler Depot, this toilet was funded by various NGO's in 2015 and serves 60 people (only two toilets). The families pay 300 BDT/month which is collected for emptying, there is also a maintenance fund of 15,000 BDT contributed at construction, intended for repair and maintenance. The toilet is disability and gender friendly and in clean condition.

- **Existing DEWATS:** The four decentralized wastewater treatments (DEWATS) located in Panchtala Colony, Khalishpur, serve 185-340 low income users each. The system was implemented by Nabolok NGO, funded by WaterAid, and includes a settling tank, anaerobic baffle reactor, planted gravel filter and polishing pond. The system cost 1.5million BDT with community contributing 260,000 BDT for a maintenance fund. The system was desludged once with the community collecting 200 BDT per household. The plant visited was in good operating conditions and the effluent appeared clear.

Field Visit Group C: Sanitation in low-income communities




- **DEWATS under construction**: SNV, with support from WSUP, are constructing two DEWATS with ABR and anaerobic filter in low income Ward 10 to serve 20 households each. The systems will cost BDT 1.9 million and the community will contribute 5% to a maintenance fund. It is on KCC land (road) and KCC will own, however responsibility for management, operation and maintenance is unclear. There is an active community group supporting the construction.

Recommendations:

1. **Improve safe emptying of public toilets:** Public toilets typically require more frequent emptying than household septic tanks. Particularly for systems that KCC own, there should be a scheduled emptying by vacuum truck based on tank size and users to ensure safe operation and disposal of emptied sludge.
2. **Clarify the roles and responsibilities for DEWATS:** While government indicated the "gave" the land and treatment to the community, the ongoing role and responsibility of KCC or KWASA in the operation and maintenance of the DEWATS is unclear. While community can operate the system, they may require support in monitoring, solving technical and financial issues and support for major maintenance and repairs. The government's role, ownership and support should be clarified.
3. **Improve the siting of public toilets:** Toilet location should be sited to ensure that there is an adequate demand need (not adjacent to existing toilets) and that the access is safe and welcoming for women (not hidden/concealed). Additionally, for community toilets, the ratio of 30 users per cubicle is inadequate for safe access.
4. **Consider DEWATS effluent:** Particularly for Ward 10 where there is only an anaerobic filter, not a wetland or pond, the effluent will be dark, smell and potentially still pose a health risk. There is currently no formal or covered drainage which will be required to ensure safe operation of the new system.

Questions from Panel/Audience:

Q: Why is the public toilet overflowing?

A: The tank doesn't appear to have an outlet so is a holding tank, containing all liquid and solid. While it is large it fills more quickly than a septic tank with outlet, and since the level is not monitored when it is full it starts to overflow. The request for KCC to empty was stated to take a few days to arrive during which time it overflows onto the ground.

Field Visit Group D: Database integration and inspection

Background

Many cities in Bangladesh have access to digital maps, called Geographic Information System (GIS). However often different departments use different maps and datasets, and unless the maps and software are well understood and up-to-date they are not used in daily planning and operation.

The objective of this visit was to understand the efforts being made by stakeholders in Khulna to integrate and improve the use of GIS for septic tank compliance and in the management of citywide sanitation services.

Sites visited and key insights



- **Khulna University (KU):** KU worked with SNV and local government build an Integrated Municipal Information System, a GIS database and mapping to support local government planning, decision making, service delivery and real-time monitoring. To develop this, they conducted data collection (4000 questionnaires) which was combined with city level administrative data (roads, drainage, buildings). This information can inform priority improvement areas and assist tax collection (holding tax and FSM). However there were some issues with the alignment of databases as building footprints are not always accurate and nomenclature needed standardizing. The intention is that the database is used by KCC to collect data on sanitation in parallel with their existing annual building assessment for tax purposes, so that in the future FSM fees can be charged with the holding tax. The database will be transferred to KCC, however there are concerns about their capacity to use and maintain/update it.
- **Low income community**: The team visited the low-income community in Bastuhara where Khulna University conducted their detailed sanitation survey, mapping the location of on-site systems. There were a number of community toilets, maintained by CDO. One toilet was visited that was built with support from WaterAid and is managed by the community. Households reported the environmental quality of the surrounding area improved with the construction of the toilet.
- **Khulna Water Supply and Sewerage Authority (KWASA):** Have a different GIS database to KCC, based on water supply customers, which is used for billing water fees. They are developing a MIS (Management Information Systems) for record keeping however, expect they will require extra staff to support the management and use of the GIS and MIS. While they do not work in on-site sanitation, they have developed a sewerage master plan which includes GIS mapping (done by a consultant) and if approved by the donor will be implemented from mid-2018 aiming for 45% coverage by 2023. They support the integration of Khulna's databases.
- **Khulna Development Authority (KDA):** KDA are responsible for development

Field Visit Group D: Database integration and inspection

control in the region and have a database mapping land parcels. However, its jurisdiction is a larger area than KCC and is managed under a different ministry therefore the database differs from KU/KCC's. Permission may be required to integrate databases with KCC, however it would be valuable. KDA do not currently use the GIS and instead manage data manually. KDA are also responsible for regulating and approving the existence and location of septic tanks in building permits, however due to a lack of manpower do not regularly inspect constructed systems. They noted that all new houses are required to connect to the future sewerage network.

Recommendations:

1. **Integrating the databases** of different agencies would be beneficial, to improve alignment, reduce duplication and increase efficiency in updating. However, combining them may be difficult due to inaccuracies and would require a platform to use it that is accessible to all agencies.
2. **Enforcing quality septic tanks:** The process of regulating and enforcing household sanitation needs to be clarified. While building compliance lies with KDA, connection to sewer or compliance with FSM lies with KWASA and KCC respectively, and there does not appear to be a common strategy for regulation and enforcement. The different service areas for sewer and FSM should be better clarified and an integrated master plan would be beneficial.
3. **Tariff collection:** An alternative to collecting FSM with the building tax, is to collect it with water bill as there is almost 100% water coverage in Khulna and KWASA's database is well managed. In addition, there should be alignment between KWASA and KCC regarding the charges for sewer and FSM.
4. **Improve shared sanitation:** As the low-income communities are now formally recognised, KCC and KWASA are then responsible for their sanitation and should improve the quality and function of shared toilets.
5. **The community development organisation** is seen as a strong stakeholder in encouraging improved sanitation in low income communities and should be included in the city's sanitation task force.
6. Consider the benefits of **integrating FSM and sewerage** management to one corporation (KWASA)
7. **Data collection:** FSM questions should be included into the national census.

Questions from Panel/Audience:

Q: What are the issues with KCC and KWASA maintaining separate databases?
A: There are no major issues, only efficiency and likelihood that the databases do not align. As KWASA is preparing to conduct a GIS survey, it would be beneficial for the databases to be aligned beforehand and they could both use the data collected, particularly if in the future KWASA also managed FSM.

2.4 Reflections on the different catalysts for change from the field visits

Introduction by Antoinette Kome, SNV Learning Event Facilitator

These four field visits highlighted some of the possible "catalysts for change", including:

a) Treatment plant and public-private partnerships (Faridpur)
b) Emptying and behaviour change
c) Focus on slum areas
d) Data collection and database integration

For Khulna, a city of approximately 1.5 million people, not everything can be done at once. While these site visits provided examples of what is already in place and ongoing in Khulna and Faridpur, *what can we take from these examples to inform another city about a suitable catalyst for change?*

Reflections from the Panel:

- **Managing Director, Khulna Water and Sewerage Authority (KWASA):** To move forward a database is important, since information is often lacking and with a database we can better understand the current situation and diagnose the issues and what is needed to more forward considering the whole city. Coordination between stakeholders is also key to progress in a city, and the coordination of KWASA, KCC, KDA, SNV, WaterAid, Khulna University and KUET is a positive example for the rest of Bangladesh.
- **Health Officer, Khulna City Corporation (KCC):** Recognised that while it was important to have a safe disposal site, the priority in Khulna now should be behaviour change. The current rate of emptying and demand for safe emptying services is low and needs to change significantly in order to see success in sanitation. KCC and SNV are working with the health department to develop a special campaign to address this challenge. It is also important to reflect on what has been done, such as through these presentations, and use this information to inform change and improve our approach until we reach sustainability.
- **Assistant Conservancy Officer, Khulna City Corporation (KCC):** Highlighted that when SNV started discussing the issue of FSM and sanitation three years ago, the issue seemed so big and difficult. However, through progressing different aspects and conducting many activities, KCC now recognises that this is one of the city's most important issues and that change is possible.

Reflections from participants on suitable entry points to change:

- **Data and understanding stakeholders:** SNV's program in Khulna focused on data collection and action research in the initial years. While at times it was criticized for not taking action sooner, this approach was beneficial to ensure an improved understanding of the current status and what needs to be improved. It was also important to the stakeholder preferences and likely reactions to

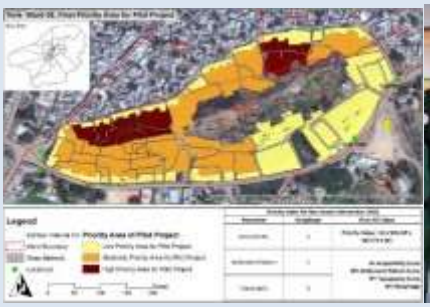
different approaches, as there are political, social and institutional influences. It was only after SNV was able to demonstrate the clear need for improvement and potential options based on the data and research, that stakeholders started to prioritize and invest in sanitation improvements. It is therefore vital to understand the situation before we can pick a catalysts.

- **Engage a large stakeholder group to progress a specific activity (e.g. scheduled emptying):** It is important to have all of the stakeholders on the same page and in Indonesia, taking the steps to develop scheduled emptying with the sanitation working group created momentum for action in sanitation. While previously the government was focused on infrastructure and ensuring long term treatment was available, by focusing on service provision the stakeholders realised that the city's progress shouldn't be held back by not having long term treatment solutions as temporary solutions are possible.
- **Increasing demand for emptying:** Since this is often a limiting factor to progress and impacts the success of emptying services or treatment, it may be useful to focus on behaviour change and demand for emptying first. In addition, it is important to ensure there are effective approaches to enforce good practices, such as "sticks" and ways to incentivize private sector involvement, such as extra profit.
- **Political buy-in:** Coming from the examples in Khulna slum areas where the councillor of the area and community steering committee were active in the project, ensuring it was constructed well and implemented smoothly, enabled issues to be solved quickly and easily as they arose.
- **Integrated planning:** Despite the motivation for database co-ordination and integration, often the information was collected in a piecemeal approach and it was not always clear how the data was used to translate into action on the ground. The data collection and management of data should be integrated between agencies and this data then should be available and used for informing sanitation planning.
- **Legal, policy, institutional framework:** In Faridpur the roles and responsibilities between the government and private actors were clearly defined, which created a suitable environment from people to move forward. Once the institutional aspect is clear, the next step is then to strengthen the capacity of the various actors, including in knowledge, equipment and services.

Antoinette Kome concluded that despite our intention to only start with one small activity, whatever entry point we chose, there is a high likelihood that, as with spaghetti, in starting one activity it possible that other aspects will also be pulled up and need attention.

BLOCK III: PATH LOCK-IN AND PLANNING

OVERVIEW OF BLOCK III: Path Lock-In and Planning


Why is this relevant?

When deciding on our entry point and planning for citywide sanitation, the following two aspects should be considered to ensure today's decisions do not significantly limit future opportunities.

- **Zoning:** City planning and services that consider the city in different zones according to specific conditions or needs and recognizing that different solutions could be applied in different areas.
- **Path Lock-In** (also called Path Dependence): Recognizes that our decisions today may set us on a path that is difficult to change in the future. Decisions could be infrastructure choices but also management arrangements, concessions or social decisions.

What knowledge and learning outcomes were intended from this block?

- To recognise the need to look ahead when deciding our entry approach
- To think upfront what zones exist and how this affects planning
- To consider whether current decisions are causing path lock-in limitations in the future
- To reflect on both sides of an argument about on-site and off-site sanitation

What was the process?

- Introduction to Block III and example of path lock-in from London
- Presentations of case studies of city wide services from:
  - ITN BUET – Institutional Regulatory Framework
  - Suraj Kumar IPE Global – Zoning and Planning in Rajasthan India
  - Freya Mills ISF UTS – Choices and trade-offs in Indonesia
- Debating game

3.1 Introduction to Block III

DAY 3 - Presentation by Antoinette Kome

In introducing this block, Antoinette presented two key ideas in urban planning: zoning and path lock-in. These both relate to how decisions and planning today can influence the options and sustainability of future sanitation improvements.

Zoning: Recognises that cities are not homogeneous and that the conditions and requirements for sanitation can differ across the city. Just as we have certain areas in the house designated to eating, sleeping, relaxing, a city can also have zones that are more suitable to different sanitation approaches or services.

Zoning is the consideration of the city in different parts and how to best plan or organize these parts to ensure city-wise services but also the best use of resources. Zones could be developed based on terrain, areas of high health or environmental risk, areas close to main sewers or treatment or by socio-economic categories.[2] Knowing this information, we can ensure that we prioritise on-site containment upgrading or FSM in areas that will remain on-site or low density, or to identify which catchments that can easily drain to an existing or proposed sewerage and consider constructing DEWATS in other areas that will not be served by sewerage. It recognises that while it may not be possible or necessary to map out every detail of the city at the start, it is important to start any sanitation planning with a rough idea about the zoning of the city.

Path lock-in: Also called path dependence, this considers whether our past or current decision lock in the path of what sanitation options we can implement in the future. Path lock-is not necessarily bad but it is important to learn from the past decisions that have limited or caused significant issues in other cities and to recognise the future implications of our decisions today. These are not only infrastructure decisions, also certain concessions, rights or social decisions can become an obstacle for progress.[3]

[2] An example of zoning in sanitation planning is given in: Narayanan, N.C. et al, "*Towards sustainable urban sanitation: A capacity-building approach to wastewater mapping for small towns in India*", Journal of Water, Sanitation and Hygiene for Development Volume 7, Issue 4, 2017.

[3] An example of urban planning lock-in for flood management is given in: Hetz, K. and Bruns, A., "*Urban planning lock-in: implications for the realization of adaptive options towards climate change risks*", Journal Water International, Volume 39, Issue 6, 2014.

Example of Path Lock-In from London Combined Sewer

London installed a combined sewerage (wastewater and rainwater combined, see 0 below) in 1850 based on their current populations needs and the priority to remove faeces from the streets, which were contributing to disease. It was also assumed that the rainwater would purify the wastewater (it doesn't) and that it would be better for overflow to go into the Thames River rather than backflow into households. Lastly, at the time it was a cheaper option than a separate sewer network for wastewater flows only.

While this system was designed for a population of 4 million, it is still in use today serving London's population of nearly 9 million, in addition due to significant urban development (resulting in more impermeable surfaces) the rainwater runoff has increased. Currently the combined sewer is overflowing weekly and the 39 million tonnes of sewerage overflowing into the Thames each year causes issues with smell, illness in recreational users, kills fish and damages a vital aquatic habitat.

However, rectifying this past decision is difficult: London is much more dense than before and laying a second sewerage pipe system in an already traffic congested city would be complex. Therefore, Thames Water was required to develop an alternative solution, to capture and divert the sewer overflows through a new tunnel, 30m deep and costing 4.3 billion pounds and taking over 6 years.

Participants watched a short video on the Thames Tideway Tunnel: https://www.youtube.com/watch?v=WfT1TSycNu4

Decision which have implications

The second D-group discussion prior to the learning event focused on the implications of past decision and included the following questions:

1. Do you have examples of decisions made in the past, which now have become an obstacle for progress in sanitation in a city?
2. What could have been done better? Or how are you trying to avoid these situations in the future?

Some useful examples from this discussion included:

- In the 1970's in Malaysia, private developers were required to build individual wastewater treatment plants in new developments which aided the rapid increase in sanitation coverage. However this resulted in a large number of small scale decentralised sewerage systems (>10,000 nationwide), which today pose challenge of high operational costs, risk particularly due to proximity to urban areas, operation logistics and difficult management. Many cities are now

considering whether to close these small inefficient treatment plants and connect them to the city's centralized network, however the cost is huge.

- In Indonesia over 25,000 community scale treatment (DEWATS) have been built, including more than 100 systems in some cities. While this has been an effective approach to scale-up sanitation due to the ease of installation in comparison with centralised sewerage, they are now difficult to sustain and manage effectively, particular as there has been the assumption that communities manage by themselves.
- There were many examples of treatment plants being built without the service, either household sewer connections or sludge emptying, since treatment plant construction often receives a greater level of attention and investment than the services. However, with low utilisation, these treatment plants may not operate effectively or unsustainable particularly if there wasn't consideration about how to make the service financially viable. Another example was the construction of treatment plants too far away from users to be feasibly or economical.
- Examples were provided from Africa where treatment plants were built without understanding the quality of sludge. This resulted in an ineffective treatment that struggled to operate with the large quantities of solid waste that were dumped in dry pit latrines.
- The focus of access rather than quality containment in some ODF campaigns has resulted in many new sanitation facilities with inadequate containment, or "sceptic" tanks that are either discharging waste to the environment or are difficult to empty.

Decisions about responsibility

As introduced by Antoinette, path lock-in is not just about technology but also considers the institutional and policy decisions. Two management considerations were provided:

i. **Municipality vs Utility:** In the near future many cities will have mixed sanitation systems, including sewerage, decentralised systems and on-site facilities. To manage and coordinate these services and the citywide sanitation objectives, there needs to be a level of overarching management. *Should this be through a local government department or through a utility (ring fenced company or independent)?*

   In reality, there is no black or white answer as it must be based on local conditions, and with either approach coordination between all parties is important. While there are benefits with a utility, such as higher engineering capacity and ability for synergies with water supply development and billing, the benefits of the municipality include coordination with health and solid waste objectives and to align with planning and housing projects. An important consideration is also whether the organisation has adequate budget control, responsibility and level of authority. While an independent/separate organisation should be responsible for oversight.

ii. **Linking technology scale with management model:** While it is often common that certain technologies are linked with specific stakeholders, such as DEWATS with community management, we should consider the different management options that exist and not be dictated by the scale of technology. Although we are often clear when we divide the roles in public-private partnership, we are less clear in defining community management responsibilities. This is not saying that community can't manage, however their capacity to undertake the various roles should be assessed and as a minimum local government should have an overarching responsibility for the city's sanitation and provide support.

3.2 Case study presentations on citywide services

3.2.1 Institutional Regulatory Framework

Presentation by Shahidul Islam, SNV Bangladesh

Shahidul presented the Institutional and Regulatory Framework (IRF) for FSM in Bangladesh which was launched in November 2017 after two years development. The IRF aims to assign responsibility to specific institutions based on existing laws and policies and facilitate sustainable FSM implementation. The IRF was developed by the Bangladesh Faecal Sludge Management Network (FSMN), a national working committee consisting of government, university, local and international development organisations. The IRF includes four documents separated into the levels of governance in Bangladesh: Megacity (Dhaka), City Corporations (including Khulna), Municipalities (called Paurashavas in Bangladesh) and Rural Areas (called Upazila or Union Parishads in Bangladesh).

Shahidul presented the Municipality level booklet, with the differences between guidelines most important in regards to the allocation of responsibility relevant to the different institutional set up at each level.

The IRF includes the following sections:

i. **Distribution of institutional roles and responsibilities –** The municipality is responsible for wastewater and sanitation, including ensuring FSM is included in planning, the implementation of FSM services and inspection/enforcement of wastewater and faecal sludge (FS) discharge.
ii. **Proper design and construction of sanitation facilities –** The municipality is responsible to check the design of sanitation facilities in new building, inspect facilities in existing buildings and gradually develop a database of all sanitation facilities.
iii. **Faecal sludge collection and transport –** The municipality either carries out or oversees the transport of FS, ensuring that it is done hygienically and transported to designated disposal site. It also suggests the municipality develop a database of properties using the FS emptying services.
iv. **Occupational health and safety (OHS) –** The municipality shall promote mechanical pit emptying services (rather than manual emptying), ensure

manual emptiers are integrated in formal collection and transportation services, and monitor and enforce OHS guidelines for emptying.

v. **FS Treatment, disposal and end-use –** The municipality is responsible for FS treatment, disposal and end-use, ensuring that it complies with existing rules and regulations, although permits FS to be disposed in pits/trenches at a site designated by the municipality until a treatment facility is built.

vi. **Engagement of private sector –** Permits the municipality to engage the private sector or NGO (ie. outsourcing) for the following activities:
   - checking design and layout of sanitation facilities
   - inspections or surveys to identifying illegal practices (FS disposed in non-designated site);
   - collection and transportation of FS
   - treatment and disposal of FS and use/marketing of end-products.

vii. **Capacity building, training and research –** National government to support the set-up of a FSM division in the municipality organogram; National research and training organisations to collaborate with relevant institutions, NGO's and private sector in FSM capacity building, training and research; Municipality to coordinate and developing guidelines for capacity building, research and training and facilitate sharing of information with other municipalities.

viii. **FS payment options:** Divides the options for FSM payments into:
   a) **Emptying fee:** paid to the collection/transport provider based on the FS volume;
   b) **Sanitation tax/charge:** paid with the holding or water tax to the Municipality, which should cover all costs of FSM including treatment, based on either water use or a proportion of the holding tax (5% in some cities).

As the IRF is a framework, there are a number of additional documents that may be needed to ensure or inform its implementation, including:

- **Circulars:** Developed by National Government, such as the "building code enforcement" or "training and certification of manual emptier", that more formally instruct the municipality to implement the activity;
- **Standards and Guidelines:** Suggested to be developed by Local government for emptying, disposal, quality control of FS by-products and protocols for licensing the use/sale of fertilizers.
- **Rules, regulations and by laws**: developed by each Municipality to incorporate the framework into local law.

The proposed immediate next steps for implementing the IRF include:

- Development of a national action plan
- Inform various national authorities about IRF
- Pilot the implementation of the IRF at the different levels, as is supported by SNV and others.

Discussion:

Q: *The presentation indicated that the municipality was responsible for building permit and septic tank design, however during the field visit, Khulna City Corporation were responsible. Why is it different?*
A: This is due to the different documents relevant to the different city scales, with the IRF presented relevant for a municipality, whereas Khulna is a City Corporation, therefore the responsibilities differ.

Q: *Is there further guidance on pricing mechanisms and funding options for FSM (fees or taxes)?*
A: The IRF suggests that municipalities can collect tax (ie. Portion water bill or holding tax) that could go towards operation and maintenance, or service providers, including private, can collect a tariff for operating infrastructure or services. The IRF does not suggest a pricing mechanism, instead the municipality should set the price in agreement with stakeholders, which should be formally set within the city's law.

Q: *How is the implementation of the legal framework enforced?*
A: The IRF provides guidance and islegally binding, as it aligns with the local government act. However, it is higher level guidance, thus the local governments are required to integrate it practically into their own policies and regulations. Enforcement is therefore challenging, however the FSM working group is currently developing an action plan for piloting implementation in different cities to provide examples of how it can be applied. It is expected to have good uptake as the development of the document was driven by various cities and stakeholders who identified a need for a National institutional and regulatory framework to guide their FSM development.

3.2.2 Practical application of GIS in FSM Planning

Presentation by Suraj Kumar, IPE Global India

Suraj detailed the application of a GIS tool to inform sanitation decision making, providing an example of its use in Rajasthan India. Following the idea of zoning, the tool allows the areas of the city to be mapped relevant to their suitability to sewerage or FSM.

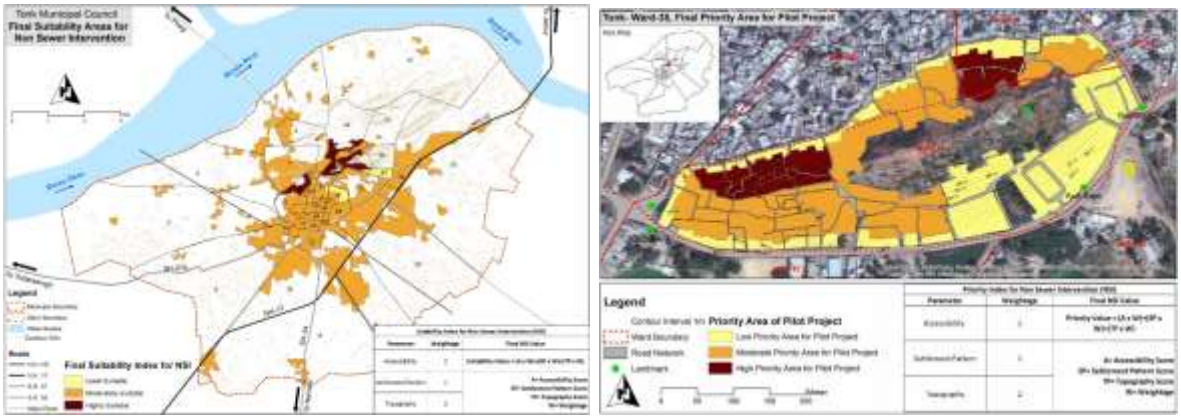
The GIS tool could be used in the following applications:

1. **Zoning:** To develop the city's sanitation masterplan and better optimize resources and costs, the GIS was used to identify which zones of the city were more suitable to sewerage or off-site sanitation. The first stage of analysis used citywide secondary data (readily available GIS layers on settlement density and patterns, road accessibility, soil type and topography) to identify areas suitable for non-sewer interventions. The second stage of analysis gathered more detailed information, including ward level data to refine the specific zones within a ward.

Suraj highlighted that this is not intended to provide black and white answers to sanitation options but provides a scale of suitability of different zones to each

sanitation solutions which can inform long term planning and optimise the implementations of FSM and sewerage services to avoid duplication and oversizing.

Step 1 – Citywide **Step 2 – Ward scale**



2. Accessibility mapping – Based on google images and maps, this application assesses the road types and widths to identify what size truck would be most suitable for the city and to identify areas that cannot be serviced by a standard truck. During service implementation this data can also be used to ensure the best sized truck is sent to each order.

3. Containment and treatment options – Using data on density, soil type, flood risk, topography and available land, this application can identify which areas may have specific needs for their on-site, off-site or decentralised treatment options and where to site treatment plants.

4. Integration of GIS and MIS – During implementation of sanitation services, such as FS emptying, the GIS could be integrated with the MIS to schedule desludging, monitoring real time work progress, for licencing and enforcement and to optimise performance. However, this is yet to be implemented in Rajasthan.

Key challenges of the use of GIS in planning and implementation of sanitation services are primarily the availability of databases, particularly those integrated to include the different services, and the capacity of government planners and technical staff to use and maintain GIS databases.

Discussion:

Q: *What types of data are required?*
A: For the first stage of citywide mapping it is possible to use secondary data such as from google or other open-source data sources. While the second stage requires a finer level of detail which included satellite images or local maps of water and sanitation infrastructure.

Q: *What is the approximate cost of the software and study?*
A: The first stage is not costly as secondary data is often freely available, although requires some random sampling to confirm its accuracy on the ground. The cost was minimal but depends on the scale of the city. In Kamai with a population of 50,000

and area of 6km^2, the cost was around 20 lakhs IDR/ US$50-60,000. IPE Global are currently setting up a module which could be applied in other cities and would make the analysis easier.

Q: *Which actors are involved in developing it?*
A: The software is typically standard and easy to use for planners however there needs to also be technical knowledge to understand what conditions are suitable or not for sewerage, therefore planners alone would require technical support.

Q: *How to keep the database up-to-date?*
A: It is evident that after 5-10 years there would be many changes in a city and updates would be required. One option is to engage a university that has the technical GIS capacity to update it every 3-5 years or as the authority requests.
Rajeev provided an example from Khulna, where the alignment of the city's sanitation database with the property database, allows for regular updating since the property database is updated annually for tax collection purposes. Sanitation questions are now included in the property survey to ask what type of toilet exists.

Antoinette highlighted the importance of maintenance for databases, particularly due to the large investment to set them up, if they are not maintained they will lose relevance. A particular challenge is staff rotation, when the person responsible or trained in the database management moves roles, it is therefore important that the information required to use or maintain the database is well documented.

3.2.3 Considerations for different sanitation options – example from Indonesia

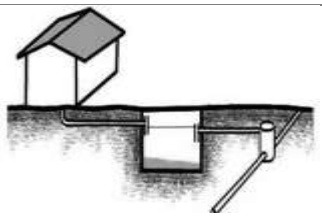
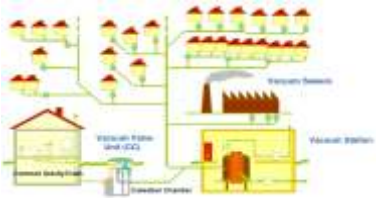
Presentation by Freya Mills, Institute for Sustainable Futures, University of Technology Sydney

Freya presented the different types of off-site sanitation and considerations for citywide sanitation decision, drawing from examples in Indonesia.

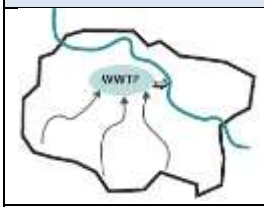
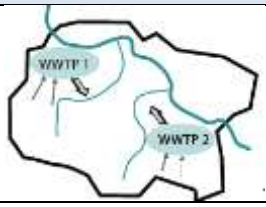
Role and type of off-site sanitation:
While there has been an increased focus on FSM, this is due to it being largely ignored in the past and citywide sanitation must still consider all sanitation options. Some particular examples of when off-site sanitation may be suitable include very dense areas where building containment and emptying is difficult or areas where infiltration of containment effluent is not possible due to high groundwater.

A number of types of sewerage exist:

Type	Flows	Details	Picture
Separate	BW, GW	Conventional sewerage which blackwater (BW from toilet) and greywater (GW from bathroom, kitchen, washing) are conveyed in a separate pipe to rainwater/storm-water (RW)	

Combined	BW, GW, RW	Sewerage and rainwater conveyed in same pipe (or open drain). During rain events, the combined wastewater often overflows to rivers/streams due to limited capacity and to protect the treatment plant.	
Solids Free	Septic tank effluent (GW, possibly RW)	Septic tank effluent connected to piped sewer. Solids remain in septic tank so pipe can be smaller and flatter than traditional sewers. Septic tank requires regular emptying.	
Vacuum	BW, GW	Decentralised vacuum pump station sucks wastewater from sealed holding tanks at each house (closed to toilet with valve). Pipe must be watertight but can be small and can go uphill.	
Pressure	BW, GW	New pump well installed at each house that grinds the waste and pumps it into the sealed sewer. Smaller diameter and shallow sewer compared with conventional gravity sewers.	

Off-site sanitation can also be at various scales, some examples from Indonesia include:

Centralised	Semi-decentralised	Fully decentralised	Community scale
			
- Large treatment plant, often serving the whole city - Typically located at the periphery of city (Example: Bandung	- Citywide plan for multiple treatment plants, often split into zones due to terrain. (Example: Banjarmasin very flat city with 7 treatment plants each with 2000-15,000 connections)	- Larger DEWATS for 200-400 households, - Typically not community managed. (Example: SAIIG program in Indonesia for cities	- Basic DEWATS systems for 20-100 households, - Often community involvement in construction and management (Example: SANIMAS Indonesia, Khulna)

100,000 connections)		without centralised treatment)	

Considerations when making decision about citywide services:

A. Scale of system should not automatically equal responsibility: Often the management of community scale sanitation has been assumed to be solely the community responsibility, despite studies finding that this is often above their capacity. Local governments should take on some responsibilities, particularly for financing major costs, monitoring, providing technical and social support.
B. Systems built by separate organisations don't have to be managed separately – Where different departments are responsible for implementing sewerage, FSM or decentralised systems, it may be more efficient to coordinate the planning, site selection and management considering they are should be part of an aligned citywide sanitation strategy.
C. Often the majority of investment and technical support is limited to sewerage treatment plants and major sewers with tertiary/local sewers and household connections often local government responsibility, despite many challenges in their design, construction and financing. To ensure investment is optimised, local governments require technical support for sewer design and property connections.
D. Sewers cannot just be installed and assumed to work forever – ongoing costs need to be budgeted for, changes in water flow should be considered and regular operation and maintenance is needed.
E. Synergies are possible between FSM and sewerage including combined treatment, FS dumping in sewers (where flow and gradient is adequate), combined sites for septage transfer station and sewer pump wells or combined tariffs.

Discussion

Q: *At what scale is sewerage considered suitable?*
A: There are many factors that need to be considered when deciding on the suitability of different sanitation options including existing infrastructure, topography, housing density, water supply, capacity for operation and maintenance, etc. Sewerage can also be at different scales (decentralised or centralised) which may suit different zones.

Q: *Is there data on the typical cost of sewerage vs. FSM?*
A: A recent study that compared the life-cycle costs of sanitation systems in Africa and Asia found it difficult to determine standard costs due to inconsistent methods of reporting and most studies only considering capital/upfront costs rather than lifecycle costs.[4] In addition it noted that comparison of costs is difficult due to the high sensitivity to local contexts (density, level of service). While this report found conventional sewerage was more expensive than on-site sanitation, a study on

[4] Dudley, L. The cost of urban sanitation solutions: a literature review. Journal of Water, Sanitation and Hygiene for Development, 2017.

lifecycle sanitation costs in Dhaka found FSM to be more expensive than hybrid solutions involving sewer.[5]

3.3 Proofs and refutations

The formal activities on Day 3 of the Learning Event closed with an informal debate, intended as a fun way of engaging with the pros and cons of sewerage versus FSM. Some of the arguments are summarised below. Note, these were provided by the participants and not necessarily validated.

Debating topic: Concerning per capita investment of sewer, the best and most equitable way forward is FSM.
Arguments from affirmative side
• FSM is more equitable since it is lower cost and faster to implement so can reach more people • FSM can therefore more easily meet SDG targets and also provide environmental benefits from resource recovery • Due to decentralised responsibility, there is a higher sense of user responsibility for their sanitation • Sewer implementation per capita and operational costs are higher than FSM • Sewerage faces a greater risk to climate change due to the need for water
Arguments from negative side
• FSM poses a greater health risk than sewerage due to the difficulty managing and enforcing safe decentralised FSM services. • While initial investment in sewerage is higher, the long-term life-cycle costs of FSM are higher when costs of trucks, roads, staff, containment upgrading are considered. • Decisions about sanitation should not be based on money alone and sewerage may be preferable due to environmental, social, cultural or acceptability reasons. • Safely emptying systems is difficult in dense areas, sewerage is more suitable

----------*The affirmative side was deemed the winner*----------

[5] Ross, I, Scott, R. and Joseph, R. Faecal Sludge Management: Diagnostics for Service Delivery in Urban Areas: Case Study in Dhaka, Bangladesh. The World Bank, Water and Sanitation Programme, Washington, DC, USA.

BLOCK IV: TWIN TRACK APPROACH

OVERVIEW OF BLOCK 4: TWIN TRACK APPROACH

Why is this relevant?

As we recognise that there are both short-term actions and long-term strategies needed to achieve citywide sanitation, how do we balance these opposite ideas and where is the best place to start?

The twin track approach considers how to combine both immediate progress yet ensuring that it fits within what is required to ensure citywide sustainable services. The benefit of this approach is to consider twin progression of short term doable actions with visible results that can increase stakeholder buy-in, and at the same time build longer term plans so we can optimise investment. Important considerations of twin track are:

A. Short term strategy becomes very long term
B. Starting too many short-term strategies
C. Short term strategies should build from the existing situation

Another key opportunity of this learning event was to optimise the knowledge and experience of other participants in helping to brainstorm and develop solutions for key issues being faced by each country. The world café provided a valuable opportunity for building knowledge and learning.

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

- Identifying the challenge of progress only short term or long-term strategies
- Develop approaches to develop short term actions that align with long term visions
- Share and learn from colleague to solve key sanitation challenges in your city/country.

What was the process?

- Riding the twin track - what could be good twin track approach for each city/country
- World café exercise – giving advice as 'consultants' on key challenges faced by each country, applying new (and old) knowledge and learning

4.1 Introduction

There are many assessment and planning tools in urban sanitation: the FSM toolbox, Wold Bank's FSM management tools, EAWAG's FSM book.[6] Despite these tools, urban sanitation remains complex and there is no single "recipe". Tools cannot replace strategic thinking and understanding what is needed for each city. While these tools provide advice on options and processes in developing FSM, there are a number of broader dilemmas in progressing urban sanitation:

1) Urban sanitation requires the buy in of many stakeholders, however staff turnover is often high
2) Sanitation is rarely a government and user priority
3) Developing a way forward requires a lot of data – which we often don't have
4) Decisions are complex and multifaceted
5) Develop urban sanitation requires long term processes –but a risk that plans requiring huge resources and time are considered too difficult to fund, so are put in a drawer and forgotten.

Sanitation planning and improvement can involve a number of stages, as shown below. However, from experience in Indonesia, often our focus on developing a big citywide plan with many stakeholders does not progress past improving stakeholder's understanding but limited transferable action. This is not saying that we shouldn't make a plan, but we must be strategic about the scope.

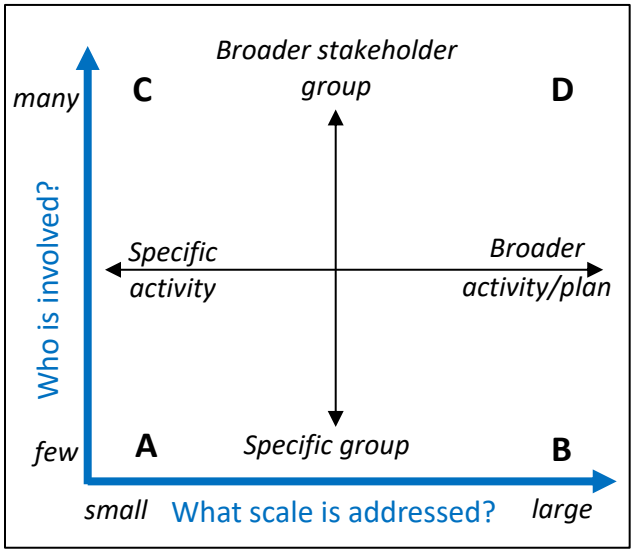
Twin Track Approach

While previous learning events have discussed citywide planning approaches, the twin track approach considers how to combine both short term and long-term strategies. The benefit of this approach is to consider twin progression of **short term doable actions** with visible results that can increase stakeholder buy-in, and at the same time **build longer term plans**. However, important considerations of the twin-track approach are:

A. **Short term strategy becomes very long term:** While an activity is perceived as short-term, in reality once it is started it might draw up many other challenges that need to be address and risk becoming too complicated that it becomes long term.
B. **Too many short-term strategies:** Because all activities are important and we cannot chose, therefore we may be tempted to progress many short-term activities at once and risk that maybe they won't be done well.

[6] AIT FSM Toolbox (www.fsmtoolbox.com), World Bank FSM management tools (http://www.worldbank.org/en/topic/sanitation/brief/fecal-sludge-management-tools), and Eawag FSM Book (http://www.eawag.ch/en/department/sandec/publications/faecal-sludge-management-fsm-book/)

C. **Short term strategies are context specific:** What is doable and short term in one context, depends on what is already in place and what is short term in one city may be long term in another. For example, the engaging private sector or developing a database will be much faster if they already exist to some extent. It may be efficient to leverage from existing successes.



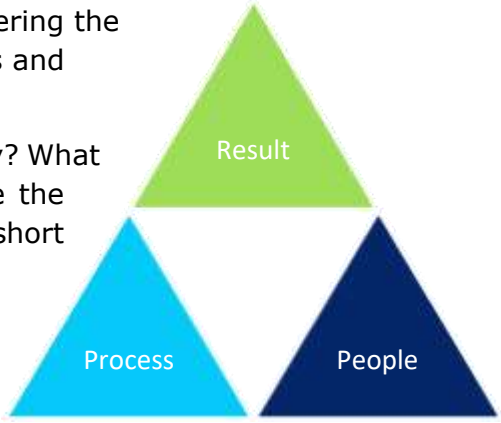
Looking again at the four quadrants, some options for twin track could include:

- Small group working on a pit emptier OH&S (A) and in parallel a multi-stakeholder group building a database (D).

- Take a large group through a specific objective such as scheduled desludging (C), while working on the FSM framework with a specialised working group (B)

4.2 Riding the Twin Track

In country groups, participants discussed how could the twin track approach be applied in each county or a specific city. Considering the previously identified planning objectives of people, processes and results.



1) **From big to small:** Is there an existing vision or strategy? What are short and long term needs in order of priority? Are the short-term actions which are: within the means, actually short term, aligned with long term vision?
2) **From small to big**: Is there isn't a clear vision, maybe it is better to start small with short term activities. However it must consider how would this impact the city if done at scale? Whose needs does this address? Will the results be visible?

COUNTRY	APPLYING THE TWIN TRACK	
	Activities from Big to Small	Activities from Small to Big
Bangladesh	• Start with a treatment: "if no treatment then nothing can be done". Treatment could be a	• BCC campaign to increase action and ownership of issue

COUNTRY	APPLYING THE TWIN TRACK	
	Activities from Big to Small	Activities from Small to Big
	low cost and improved stage-wise. Outsourcing to private sector could be considered. • Develop an area plan • National policy on OH&S to improve safe emptying practices and in long term aim to reduce manual emptying.	• Developed a manual and guideline for OH&S of emptying for local government – considering local policy documents and labour laws. • Training and certificates for emptiers for safe emptying and conditions to prioritise certified emptiers receiving government emptying jobs.
Indonesia	Considering the city of Metro, which has a city sanitation strategy (as do most cities in Indonesia), which was updated in 2016: • Next 5-year sanitation plan should integrate the need for upgrading onsite systems to achieve safely managed sanitation. Regulation and enforcement for upgrading should be developed before the behaviour change campaign. • Long term – need to increase capacity of management institutions • Envision that all sanitation is managed under a single institution.	• Standard Operating Procedure for Treatment. While there is an existing sludge treatment plant, it only receives a few trucks per month. Its operation under low-flows should be reviewed and a SOP produced. Additionally, staff require technical skills and OHS training. • Develop standards for septic tank upgrading; build capacity for its implementation; and develop processes to ensure compliance
Nepal (Jumla)	• FSM advocacy with new elected mayor • Consider alternative disposal options (ie. Trenching) since land for a treatment has been difficult to obtain in the previous year • Improve toilet access of for marginalized groups as there are limited gender or disability suitable toilets in public areas.	• Develop a FSM business plan with CCI and determine a suitable tariff. • Train emptiers in OHS
Tanzania (Arusha)	• Increase awareness about FSM, particularly at the community and local government level.	• Situation analysis to understand the current status of sanitation and provide data as a starting point.

COUNTRY	APPLYING THE TWIN TRACK	
	Activities from Big to Small	Activities from Small to Big
	• Consider how the masterplan can incorporate zoning, particularly with regards to identifying the likely sewer expansion areas. • Consider how the national and city 5-year strategic plans can be integrated.	• Confirm policies don't limit urban areas to sewerage solutions only rather than on-site only options (as the policies are traditionally focused on rural areas) • Piloting technologies across the whole sanitation value train.
Zambia	• National level stakeholder coordination to bring together different ministries (e.g. CU, LA, MOH, MWSEP, MLG, NGO partners) • Highlight that the "District Total Sanitation Plan" does not include urban and that the City Feasibility studies do not consider FSM. • Integration of FSM in the existing sanitation programs such as solid waste management	• Request that national stakeholders can be included in Lusaka regulations and standards development so that they can be more nationally relevant • Carry out a baseline survey to trigger stakeholders for action • Create sanitation working committees at local level • Strengthening enforcement of sanitation laws, e.g. building regulations, drainage and latrine regulations of the PHA • Pilot FSM programs

Discussion:

Q: *In Nepal it is difficult to get government to prioritise sanitation since they don't think it is a priority in comparison with solid waste. How have you addressed this challenge?*
A: Advocacy around the importance of FSM for public health and environment was important. It was valuable to work with a variety of stakeholders, particularly due to regularly changes in government staff or when the institutional responsible for sanitation was unclear (as occurs often in urban particularly in small towns).

Q: *What is the difference between the old City Sanitation Strategy (CSS) in Indonesia and a revised one?*
A: While the previous CSS had three documents (existing conditions, strategy and investment planning), the revised document is more condensed and easier for a city to update. There are also new tools that can help provide suggestions about what sanitation options could be considered. The previous CSS varied widely in quality and implementation, some were well adopted, often those with good stakeholder participation during development, others remained unused documents. The CSS

requires regular review and updating, in particular following elections of a new mayor to ensure the plan aligns with their vision.

***Q:** Indonesia commented that many of the sludge treatment plants are not functioning due to low use. What is the plan to improve this?*
A: There is now a greater priority on FSM services, not just investing in treatment. Therefore priority will now be given to investing in cities that are in parallel improving their FSM services. Another challenge to improving emptying is inadequate containment, with a national program also addressing onsite sanitation improvements which is hoped will lead to increased emptying.

4.3 World café – advice to address key challenges

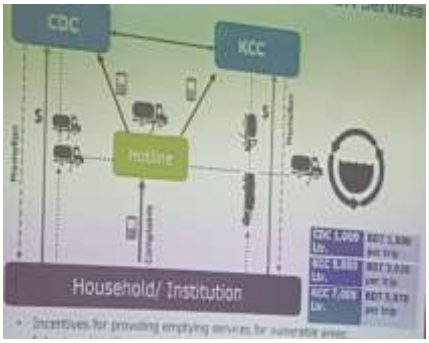
Following the discussions and ideas over the four days, count-based groups developed two priority issues/problems that they would seek advice on from 'consultants'. Two people from the country group were appointed to be the country 'client' while the remaining participants were allocated to 5 mixed groups of 'consultant companies' who rotated amongst the clients to offer their advice to the questions in 15-20 minutes.

The briefs and advice offered are summarised below.

BANGLADESH	
	**ISSUE AND PROBLEM/BRIEF FOR CONSULTANTS** **Issue:** While there is progress in FSM and a new treatment plant, there is insufficient emptying demand. We wonder whether better planning could optimise the FS treatment use. **Problem statement**: What citywide FSM planning tools could be used and how to apply it?
ADVICE FROM CONSULTANTS	
- Focus on improving septic tanks – demand will increase with proper septic tanks. In particular improve supervision during construction to ensure they are built properly. - Shift away from manual emptying will increase sludge delivery to treatment. But recognise that this takes away jobs from sweepers so they should be supported and retrained in another profession. - Research the filling rate of different types of systems and determine a suitable time for emptying, then develop a scheduled emptying program. - Increase awareness of the risk of pollution from inadequate sanitation through GIS mapping as risk mapping is a big shock and valuable to advocacy. This could	

be done using the database of septic tank types, and then estimate the general pollution loadings to drain or groundwater.

INDONESIA



ISSUE AND PROBLEM/BRIEF FOR CONSULTANTS

Issue: Many cities in Indonesia are trying to initiate FSM but unsure what approach is best.
Problem statement: Want suggestions for business models to develop FSM in medium size cities, particularly to ensure the service is self-sustainable, especially financially, so that it doesn't require much subsidy from local government.

ADVICE FROM CONSULTANTS

- Start with a detailed assessment, including willingness to pay. However, consider the order of the WTP with BCC since the responses may change with increased awareness.
- Assess the demand, businesses will come if there is evidence of potential profit
- While there are private roles, sanitation is a government obligation and they should invest
- Consider different service options: Such as full management by a government institution or in partnership with community, NGO or private sector.
- Combine tax and tariffs and cross subsidising to make the whole system work.

ZAMBIA

ISSUE AND PROBLEM/BRIEF FOR CONSULTANTS

Issue: Institutional challenge. There are two separate ministries responsible for sanitation.

There is the Local Government which reports to its own ministry and the Water and Sewerage Authority which reports to the Ministry of Water, Sanitation and Environmental Protection. Both are somewhat responsible for sanitation but the roles in urban areas are unclear.

In addition, FSM is not regulated in policy.

Problem: How to begin FSM in a municipality with two separate authorities reporting to different ministries?

ADVICE FROM CONSULTANTS

- First need a stakeholder coordination meeting to ensure alignment with objectives, plan and implementation. Start at national level coordination then work with city level stakeholders.
- Develop a multi-stakeholder engagement platform at city level.
- Ensure that engagement focuses on the city's key decision makers
- Databases and tools can aid advocacy and decision making. Also there may need to be coordination between local government and the water agency and decisions who operates the database.

NEPAL

ISSUE AND PROBLEM/BRIEF FOR CONSULTANTS

Issue: Jumla has recently been upgraded to a municipality from a rural district. There are different needs in the more urban inner areas, such as emptying, that were less of a priority in rural areas. Also there is no treatment plant and we have faced difficulty finding land since community acceptance is low.

Problem statements: 1. What urban sanitation system is best for this municipality as it transitions from rural to urban?

2. Suggestions for designing co-composting in mountainous area with high slope?

ADVICE FROM CONSULTANTS

- In rural to urban transitions stakeholder mapping is valuable to understand institutional structures
- Collect data for planning and regulatory needs, involving the municipality in data collection and analysis.
- Develop an awareness program to educate community, highlight that FSM is for their benefit. As well as leveraging off the success of ODF and promote that FSM is the next step
- Conduct a market study to understand if there is a market for co-composting and promote to private sector.
- Start with a pilot to test the approach and use it to convince the public to provide land.
- Consider a secondary transfer station if land for treatment is far away.
- In parallel develop solid waste collection and segregation since organic waste is needed for FS composting.

TANZANIA

ISSUE AND PROBLEM/BRIEF FOR CONSULTANTS

Issue: We are new to urban sanitation in our program cities and uncertain where to start.

Problem statement:

1. Institutional – Two authorities, municipal council and water and sewerage authority, responsible for different aspects of sanitation. Should they be separate or come under one roof?
2. FSM – what can we apply from other countries?
3. Suggestions on strategies to reach the slum areas?
4. How to set tariffs for sludge emptying?

ADVICE FROM CONSULTANTS

- Action research – need to understand the situation, the stakeholders, demand and needs.
- Set up multi-stakeholder platforms to discuss and delineate responsibility while in parallel look whether existing policy documents clarify roles and responsibly
- Look to develop a FSM framework taking lessons from IRF
- Leverage community development corporations and slum leaders for improving slum sanitation
- Tariffs are necessary, the service shouldn't be free, but differentiated tariffs could be set up to subsidise low income areas.

BLOCK V: COUNTRY SHOPPING BAGS AND WRAP-UP

OVERVIEW OF BLOCK V: COUNTRY SHOPPING BAGS AND WRAP-UP

Why is this relevant?

The ultimate goal of the 'knowledge and learning' component of the USHHD program is for practices on the ground to be improved through learning about 'best' practices. Through this learning event participants have been exposed to international best practices while also sharing key success and challenges across countries. Learning is improved by reflecting on how the best practices can be applied in your conditions, while action is improved through making public commitments and being accountable for them – which are the aims of this block.

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

- Consolidation and reflection about what has been learnt
- To develop short and long-term actions to take home to each country or city's urban sanitation program
- To share learning and reflections with broader WASH community

What was the process?

- Develop 'shopping bags'– internal country group reflections on what has been learnt that they want to take home and share to improve practice in their countries.
- Country groups sharing the key reflections from the learning event on D-group.

5.1 Country group 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. In country groups participants reflected on learning highlights from the four days and used this opportunity to collect detailed ideas and information from other participants.

Documenting what is in each country's 'shopping bags' holds participants accountable to knowledge and learning they pledge to take back. SNV leaders plan to check on which pledges have been kept in upcoming months.

Country	Shopping bag contents – learnings and actions
Bangladesh	- GIS based planning for FSM, follow up how to get training to implement from India. - Improve the definition and evaluable of ODF declaration to ensure sustainability, learning from Zambia's examples. - Consider how to integrated sewer and non-sewer solutions suitable for long term - Include zoning in short term planning

Indonesia	- Investigate opportunities for detailed GIS mapping to facilitate zoning - Consider the need for an overarching management institution for wastewater and FSM, both the benefits of one institution but also need to analyse different scenarios. - Develop guidance for different business models for FSM - Define a process for developing demand creation for emptying – including data collection, strategy design, monitoring, update - Increase partnerships between city authorities and community organizations - Consider potential pitfalls of pro-poor/subsidized approaches, particularly for the sustainability of service providers.
Nepal	- Consider how GIS can be applied in urban sanitation planning and the alignment for developing database – government, private, university - Prioritise multi-stakeholder involvement in planning - Consider potential for sewerage options when no emptying system is feasible. - Co-composting of organic waste as a way to motivate private sector involvement - Look into public-private-partnership models - Ensure local community collaboration during sanitation management in slum areas
Tanzania	- Develop a regulatory framework for FSM, since there is not yet a policy for sanitation. - Set up stakeholder committee at local level - Zoning and use of GIS (India) and need for a clear plan for both sewerage and FSM. - Consider opportunities for reuse and co-composting (Practical action) - Integration of databases from different authorities so that data is available to inform planning and management.
Zambia	- Strategic short and long term thinking and generate mixed plans (FSM and sewer) anchored on the city's current set-up and use different tools. - As part of baseline generate shit flow diagrams and zoning for each town - Develop a multi-stakeholder engagement platform and coordination, and focus on key decision makers at strategic level - Work with research institutions – either tertiary or pure research - Action oriented research – to identify barriers to service delivery. - Develop databases that can aid decision making - Promote that treatment does not need to be the only solution

India	- National government mandate for treatment, such as Indonesia's examples - Low cost treatment plant can be set up in short time - Work with community development committees, particularly those that are already active in low income communities - Using co-composting for aquaculture - Support greater involvement in FSM by university students, such as scholarships

5.2 D-Group contributions

Country teams shared their reflections on the learning event with the D-group, which along with this report aims to share the knowledge and ideas for progressing urban sanitation with the broader WASH community.

Tanzania: Following the learning event, some of the key entry points to change for the SNV program cities in Tanzania include:

- *Harmonization of data:* recognizing the importance of detailed and aggregated data which is shared and accessible by all the institutions involved in urban sanitation. They noted that careful attention must be given to regular updating of the database so that it is useful for decision making while a user-friendly interface makes it more easily accessible by different stakeholders.
- *Increase decision makers awareness about FSM:* This will be prioritised in the partner cities due to its value in securing buy-in of political and administrative leaders. It relies on providing the leaders with detailed and strategic information on FSM related issues and data. This information must be concise and linked to the broader goals and plans of the cities.
- *Awareness and sensitisation on FS reuse***:** As this is the new approach in Tanzania, there will need to be adequate sensitisation to the community, and especially private sector, that wastewater has agriculture benefits and business opportunities.

Zambia: Identified the following entry points and steps to progress considering the existing situation in the project towns:

- Stakeholder consultative meeting involving the CUs, LAs, Ministries (Water & Sanitation, Health, Local Government), NGOs. This meeting could create a multi-stakeholder coordination platform; require that District Total Sanitation Plan integrates both urban and rural sanitation requirements; and to strengthening enforcement of sanitation related laws (e.g. building, drainage and latrine regulations of the public Health Act)
- National stakeholder involvement in Lusaka Sanitation Project initiatives including participation in committees such as (a) Regulations and enforcement and (b) Standards to make them nationally relevant.
- Pilot of FSM programs to provide examples and learn from
- Integration of FSM in existing sanitation programmes in the Local Authorities, such

as in Solid Waste management, and create linkages
- Undertake baseline survey whose information will be used to trigger stakeholders to take action and for decision making (planned for January 2018)

Nepal concluded the following priorities for urban sanitation improvements which are applicable in all cities:

Ensure	Avoid
• Plan and implement as per available resources and local context • Start with what we have and strengthen existing processes and structures (example of using cleaners at Faridpur municipality to develop a sludge emptying cooperative) • Assess the required functions along each step of the sanitation value chain and who is best placed/appropriate/legally bound to carry them out within the country context • Be creative in developing service models and business models for city-wide services; implement them; and improve them. Examples include: construction of a treatment between two towns in Rajasthan which made it more financially viable, or including civil society organizations in outreach to slum settlements as was done for emptying in Khulna.	• Waiting for the perfect data set to plan interventions and where possible avoid duplicating data sets • Disadvantaging existing service providers/groups (e.g. manual emptiers) when new services or actors are introduced. • Thinking that demand for faecal sludge emptying services will rise automatically if good services exist. Creating demand is a constant effort requiring regular communication campaigns, marketing by service providers, and making uptake easy and hassle-free for the consumers. • Forgetting the poor.

5.3 Closing of Learning Event

Closing comments from Antoinette Kome learning event facilitator

Antoinette Kome thanked all participants for their enthusiastic participations in the learning event and to everyone for contributing to its success. She especially thanked

- The Bangladesh team for their organisation and logistics for the learning event.
- Khulna City Corporation for their support organising the learning event with SNV, and for travelling alongside SNV in complex discussions.
- All of the presenters.
- KUET (Khulna University of Engineering & Technology) for their support.

The event concluded with a cultural dinner in Khulna.

ANNEX 1: LIST OF PARTICIPANTS

Country	Participants Name	Gender	Designation	Organisation
India	Suraj **KUMAR**	Mr	Senior Program Manager, Urban Reforms	IPE GLOBAL
Zambia	Kumbulani **NDLOVU**	Mr	WASH Sector Leader	SNV, Lusaka, Zambia
Zambia	Susan Phiri **MUSUMALI**	Ms	Commercial Manager	Lukanga Water and Sewerage Company, Kabwe
Zambia	Willard Mulwabo **MUTOKA**	Mr	Managing Director	Chambeshi Water and Sewerage Company, Kasama
Zambia	Moses **MUTYOKA**	Mr	Director Public Health	Ministry of Local Government /Mbala Municipa
Zambia	Moffat **TEMBO**	Mr	Urban Sanitation Engineer	SNV, Lusaka, Zambia
Tanzania	Olivier **GERMAIN**	Mr	WASH Sector Leader	SNV
Tanzania	Salama Omari **KITENGE**	Ms	Business Development Advisor	SNV
Tanzania	James Pangras **LOBIKOKI**	Mr	Arusha City Environment and Sanitation Officer (CESO)	Arusha City Council
Tanzania	Hezron **MAGAMBO**	Mr	Urban Sanitation and Hygiene Engineer	SNV
Tanzania	Deusdedith Magoma **MAGOMA**	Mr	Principal Enginer Water, Sanitation and Hygiene	President's Office for Regional And Local Government
Nepal	Nadira Anwar **KHAWAJA**	Ms	WASH Sector Leader	SNV
Nepal	Anish **SHRESTHA**	Mr	M&E Advisor for WASH	SNV
Nepal	Ram Datta **RAWAL**	Mr	Chairperson	District Chamber of Commerce Industry (DCCI), Jumla
Nepal	Ghanashyam **NAGARKOTI**	Ms	Chairperson	Surya Social Service Society
Indonesia	Maria Joao (Refachinho Mourao) **CARREIRO**	Ms	WASH Sector Leader	SNV
Indonesia	Aldy **MARDIKANTO**	Mr	Planner at Directorate of Urban, Housing, and Settlements	Head of the Sanitation Sub-Directorate of the Directorate of Urban Housing and Settlements, from the Ministry of Planning (Bappenas)
Netherlands	Sharon **ROOSE**	Ms	Senior Advocacy Officer WASH	SNV

Netherlands	Antoinette **KOME**	Ms	Global Sector Coordinator WASH	SNV
Netherlands	Freya Alexandra **MILLS**	Ms	Senior Research Consultant	ISF
Bangladesh	Rajeev **MUNANKAMI**	Mr	FSM programme leader/WASH SL	SNV
Jhenaidah	Md. Tauhidur Rahman	Mr	Project Manager, FSM Jhenaidah	AID Foundation
Faridpur	Engr Suman Ali	Mr		Practical Action Bangladesh
Khulna	Md. Mostafa	Mr	Town Manager	NUPRP
Dhaka	Saief Manzoor Al Islam	Mr	Programme Officer-Engineer	WaterAid Bangladesh
Dhaka	Dr. Farzana Begum	Ms	Research & Policy Lead	Water & Sanitation for the Urban Poor (WSUP)
Jessore	Abdullah Al Masum El Masum	Mr	Secretary	Jessore Paurashava
Benapole	Rofiqul Islam	Mr	Secretary	Benapole Paurashava
Khulna	Dr. Swapan Kumar Halder	Mr	Health Officer	Khulna City Corporation
Dhaka	Md. Azizur Rahman	Mr	Research Officer,	ITN-BUET
Khulna	S.M. Tafsirul Islam	Mr	Urban & Rural Planning	Khulna University
Dhaka	Begum Tasnim Tamanna	Ms	Executive Engineer	DPHE
Khulna	Md. Sayfuddin	Mr	Executive Engineer	CRDP
Dhaka	Francesca Tilmans	Ms	Internship at SNV-BD	
Dhaka	Mr. Rakib Uddin Ahmed	Mr	Information and Documentation Officer	ITN-BUET