Sanitation Capacity Building Platform

CAPACITY NEEDS ASSESSMENT: ADDRESSING URBAN FAECAL SLUDGE AND SEPTAGE MANAGEMENT

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Foreword

The challenge of urban sanitation is commonly understood as one of inadequate number of toilets (specially in slum settlements and public places), people not using available toilets, poor operations and maintenance of public toilets and related problems of solid waste and drainage. Hence the focus of Swachh Bharat Mission is primarily on toilet construction and sewage is programed under AMRUT (Atal Mission for Rejuvenation and Urban Transformation). Addressing the safe disposal and treatment of faecal sludge, that is generated from septic tank based toilet systems, is not adequately addressed. This is alarming considering the size of urban population (78.9 million as per 2011 census) with only 8% of the statutory towns of India having an underground sewage network connectivity for more than 50% of population of a town. As per the 2011 Census, urban households having access to toilets within their homes stood at 81.4% while only 32.7% toilets were connected to sewer systems. The crisis of unsafe conveyance, treatment and disposal of human faecal waste is evidenced from the fact that a majority of the existing sewage treatment plants are not functional(64%) leading to a situation that only 37% of the sewage generated in India is treated.[1]

Considering the emerging challenge of faecal waste management that goes beyond sewage treatment solution alone, the Ministry of Urban Development has provided an enabling national policy framework for addressing the growing challenge of safe handling and treatment of septage, through the launch of the National Urban Faecal Sludge and Septage Management (FSSM) Policy[2], Capacity building and training as core components of the policy. States are expected to formulate appropriate state level FSSM Policies. They are also expected to identify agencies that will train state level urban local body (ULB) officials and elected representatives and encourage citizen engagement in FSSM.

NIUA created a national level capacity building partners platform called the Sanitation Capacity Building Platform (SCBP) in 2016 to support the Ministry of Urban Development focus on FSSM. The work was initiated in two towns each in Uttar Pradesh, Bihar and Andhra Pradesh. The capacity building focus of SCBP included a system of activity based capacity building support measures which involved undertaking assessments of the faecal sludge generation and disposal; supporting the states in submitting their plans and budgets for septage treatment under the State Annual Action Plan(SAAP) for 2017; supporting the development of the state level FSSM Policy for Uttar Pradesh (draft stage); conducting training programmes for ULBs; and preparation of model Detailed Project Reports (DPRs) for two towns.

The Capacity Needs Assessment was undertaken as part of the SCBP work. It was carried out through a process of intensive engagement with officials of six towns. Lessons learnt during the roll out of training modules and provision of technical support, have been incorporated into the recommendations. The assessment provided the basis for the SCBP strategy. The report contains specific recommendations for State and ULBs, for promoting FSSM. The report is produced as a collaborative engagement of NIUA and Centre for Affordable Water and Sanitation Technologies (CAWST). NIUA team for this work included Ankita Gupta, Jyoti Dash, Paramita Dey and Depinder S Kapur. CAWST team included Laura Kohler, Tommy Ngai, Lee Boudreau and Sterenn Philippe. NIUA acknowledges the input provided by Aasim Mansuri and CEPT University in the finalization of this report. We acknowledge the support provided by Roshan Shrestha of the Bill & Melinda Gates Foundation. We hope this will contribute to the achievement of national and state level sanitation goals of the Swachh Bharat Mission and the AMRUT programme.

Jagan Shah
Director, NIUA
April 2017

[1] *Central Pollution Control Board CPCB 2015 report.*

[2] *http://www.swachhbharaturban.in:8080/sbm/content/writereaddata/FSSM%20Policy%20Report_23%20Feb_Artwork.pdf*

Contents

Executive Summary

National Insitute of Urban Affairs with the support of the Bill & Melinda Gates Foundation (Gates Foundation) and in partnership with a few leading sanitation sector organisationof India, initiated the Sanitation Capacity Building Platform (SCBP) for addressing the challenge of faecal sludge and septage management.

The SCBP programme work began in mid 2016, based on the approval from Ministry of Urban Development (MoUD), Government of India. One of the first activities was undertaking a capacity needs assessment for FSSM. Six towns in three states (Uttar Pradesh, Bihar and Andhra Pradesh) of India were identified for the programme and the assessment was undertaken to identify capacity gaps and capacity building programme intervention priorities.

Simultaneously, city level FSSM desk assessments were undertaken at scale in UP Uttar Pradesh for all AMRUT towns and for a few other towns in AP and Bihar, two Detailed Project Reports (DPRs) prepared for setting up of decentralized on site faecal sludge treatment plants in Unnao (Uttar Pradesh) and Bhagalpur (Bihar), a draft FSSM Policy Paper for Uttar Pradesh was prepared, and strengthening the Regional Centre for Urban and Environmental Studies (RCUES) Lucknow in undertaking a set of FSSM orientation trainings.

The FSSM capacity building experience of SCBP was critical for firming up the findings and recommendations of FSSM capacity gaps at the ULB and state level and this report is an outcome of this initial work done. We are able to identify and come out with specific FSSM capacity building recommendations, beyond the six towns where the initial assessment was undertaken.

As more and more Indian towns and cities achieve Open Defecation Free (ODF) status, the challenge will shift towards addressing the safe containment, treatment and disposal of faecal waste. Most Indian towns will not be able to afford and implement large capital intensive Sewage Treatment Plants (STPs) in the coming deacde. Urban population growth will constantly put pressure on any STPs to meet the growing demand. Given that two thirds of India is semi arid, there will not be enough water for covering all the urban population with STPs. Septic tanks and septage will remain a challenge for the coming decades. Hence it is critical that states and ULBs in India start addressing the growing challenge of addressing the treatment and disposal of septage (and also the waste generated from STPs).

Key Issues and Challenges at Town Level

- There is an absence of credible estimates of the type of septic tanks in a town. It is difficult to assess the volume of sludge generated and the frequency of cleaning of septic tanks and hence the treatment potential and options.
- However there is a growing realisation at the town level that dumping of septage waste in an indiscriminatory manner will not be possible in the near future. In some towns there is poor drainage and septic tanks are being used as soak pits.
- Overflowing drains with faecal waste that empty into water bodies, rivers or in open fields are a major concern for all residents of towns.
- Parastatal agencies still consider Sewage Treatment Plants (STPs) as ideal solutions and decentralised faecal sludge treatment plants as sub-optimal solutions. Decentralised FSSM treatment solutions are yet to be accepted as effective and perhaps more appropriate faecal sludge treatment solutions especially for water starved and poorly financed urban local bodies.
- In most small towns Sewage Treatment Plants (STPs) are either non existent or are non functional.
- Small ULBs are under staffed for critical positions and do not have powers of enforcement.
- Elected office bearers such as the Chairman and Mayor of towns are more positively tuned to the growing problem of unsafe disposal of faecal waste and the need for its treatment. They need to be tapped into any capacity building initiative on FSSM.
- FSSM has to be situated within the larger context of solid and liquid waste management of a town, and solutions sought under an integrated approach instead of separate solutions.

There are obvious gaps in the understanding, knowledge and capacity of town level functionaries regarding safe containment, collection and transportation and treatment of disposal of faecal waste, at all levels. However capacity building for FSSM cannot be a formal classroom training initiative focusing on septage management alone. Generating demand and awareness for addressing the faecal sludge management challenge should be the first priority.

Development of a state FSSM policy provides an enabling environment for urban local bodies in the towns to initiate projects for treatment of septage, other than sewerage treatment options.

There is a wide range of technology options for treating septage waste. Decentralised low cost solutions are the most affordable in terms of capital and operations and maintenance costs. However the choice of technology option should be left to the ULBs. More attention should be paid to developing capacity of the ULBs for pre and post treatment scenarios–how to operationalize incremental improvements in septic tanks design and improving their efficiency of treatment, in developing norms and incentives for timely desludging operations, for safe handling of septage and its ultimate disposal and reuse for agriculture.

State governments are keen to initiate pilot projects for FSSM treatment solutions as complementary to sewerage systems. Capacity building for FSSM should be for all stakeholders including the government, private sector and NGOs.

Recommendations

A lot needs to be done to ensure the aims of the National Urban Sanitation Policy and the National FSSM policy are met. This capacity needs assessment report provides detailed set of recommendations for the SCBP programme, what could be the priority focus for FSSM capacity building in general and for State governments and the ULB.

Key recommendations are divided into four sections. Detailed recommendations are in the main report.

1. SCBP Strategy for FSSM Capacity Building

- Capacity building for FSSM cannot be positioned for only a few ULB staff; it has to be state wide for all sanitation and parastatal water and sanitation agency staff.
- FSSM capacity building is more than formal classroom based training; it should incorporate a set of activities based on capacity building support.
- Formal training modules for FSSM capacity building should start with a basic FSSM exposure and orientation for higher level ULB functionaries and elected representatives.
- State nodal training institutes are best suited to

Capacity Needs Assessment: Addressing Urban Faecal Sludge and Septage Management

deliver the FSSM capacity building work.
- Hands-on support for implementing incremental FSSM improvements at town level will be a critical capacity building input.
- National level urban sanitation research and advocacy needed.

2. Priority Capacity Building Areas for FSSM
- Technology options for FSSM should be left to the ULBs to choose from what is available in the market.
- Develop financing options for setting up Faecal Sludge Treatment Plants (FSTPs) needed and capacity of ULBs for accessing them.
- Use appropriate frameworks and tools for FSSM planning, depending on the ULB capacity and need.
- Integrate FSSM into the Service Level Benchmarks (SLBs) for urban local bodies' performance rating
- Developing appropriate training modules for different levels of ULB staff and stakeholder and align with AMRUT and SBM capacity building modules.

3. FSSM Promotion by the State Governments
- Have an incremental framework for addressing sanitation and FSSM. States should aim to achieve open defecation free (ODF) cities and then ODF + and ODF ++ as demonstrated by Maharashtra. FSSM will come under ODF and ODF ++.
- Provide an incentive fund for ODF cities to adopt FSSM.
- Strengthen systems at state level to enable FSSM and sanitation uptake.
- Strengthen the ULBs by creating a cadre of permanent professional staff for town planning that can also handle FSSM.
- Enable a state level FSSM policy environment — the first step required to promote FSSM in small towns in India. The states of Maharashtra, Orissa and Tamil Nadu have come out with operational guidelines and policies for faecal sludge management and treatment.
- Develop a state FSSM strategy and mechanism to achieve incremental FSSM improvements starting with a few towns and expanding phase-wise to all towns and cities of the state.
- Institute enabling state level reforms and laws that enable ULBs to enforce norms and regulations for septic tanks, de sludging and treatment and disposal.
- Ensure clarity of roles and responsibilities among different parastatal nodal agencies for implementing FSSM solutions and for managing operations & maintenance.
- Undertake a state-wide FSSM capacity building and orientation programme for all towns of the state and use AMRUT funding for this activity.

4. FSSM Promotion at the ULB/Town Level
- Situate FSSM in the larger urban planning and sanitation context within a city for all aspects of liquid and solid waste management.
- Undertake awareness activities for scheduled desludging/ regular emptying of household septic tanks.
- Undertake capacity building of local masons for septic tank construction and maintenance works.
- Create a city level fund to capture potential sanitation funding from CSR, donors and philanthrophists.
- Integrate FSSM solutions as part of the Master Plan or city sanitation plans of the town/city.
- Undertake a sanitation census and mapping of towns that is not just a toilet census but also takes into account septage related variables.
- Undertake assessment of the FSSM/septage problem of towns, based on analysis of the census results. Seek guidance form the state to support improvement measures.
- Initiate FSSM improvement actions
- **Adhere to national and state level norms and guidelines and parameters** for FSSM

We hope this report and recommendations will serve as a useful guide for all stakeholders in the state governments and ULBs and anyone else interested in addressing the sanitation challenges facing urban India.

Capacity Needs Assessment: Addressing Urban Faecal Sludge and Septage Management

Introduction

Background
Recognising city-level capacity limitations for decentralised sanitation planning and implementation in India, the Ministry of Urban Development (MoUD) appointed the National Institute of Urban Affairs (NIUA) as the anchor organisation for a Sanitation Capacity Building Platform (SCBP) to support cities in their sanitation planning and implementation. NIUA partnered with CAWST,[2] a capacity development organisation, to design and initiate the SCBP with the goal of building the capacity of cities and relevant stakeholders working in urban sanitation. This effort is to ensure improved delivery of sanitation services through decentralised approaches, namely Faecal Sludge Management (FSSM). At the programme's outset, MoUD identified six initial cities in three states to support in delivering FSSM. The six cities include Unnao and Ghazipur in Uttar Pradesh, Proddatur and Gudur in Andhra Pradesh, and Hajipur and Bhagalpur in Bihar.

To support these cities in the planning, design, implementation and continued operation of FSSM the first function of the platform is to understand the structure of the city, to determine existing sanitation services, and to assess the knowledge and attitudes of key stakeholders at the state and city level, such as municipal staff and public administrators related to FSSM. This report examines the process of implementing such an assessment—the research, planning, challenges, findings, and recommendations—both to inform and improve future city assessments in India, and more broadly, to provide further steps for the already assessed six cities.

Objective
The objective was to determine capacity gaps—specifically around managerial, technical, financial, and institutional level capacities—of key stakeholders at the state and city level. The following key stakeholders were identified:

- State-level officials
- Commissioners and/or city level officials
- General municipal staff
- Health department staff
- Engineering department staff
- Sanitation system emptiers
- Masons/installers

This report is based on the assessments done for Unnao and Ghazipur in Uttar Pradesh, Proddatur and Gudur in Andhra Pradesh, and Hajipur and Bhagalpur in Bihar in order to guide the development of their capacity building programmes.

[2]Centre for Affordable Water and Sanitation Technologies(CAWST) is a Canadian charity and licensed engineering firm. CAWST addresses the global need for safe drinking water and sanitation by building local knowledge and skills on household solutions people can implement themselves.

Methodology

The methodology of the needs assessment consists of two parts. First we developed a questionnaire. We then used the various questionnaires to interview and hold focus groups with the various stakeholder groups at the state and city level.

Questionnaire Design

To design the templates for interviews and required focus groups CAWST and NIUA first reviewed existing documents and research within two main streams: the sanitation status of India and the SCBP's six cities; and from previous capacity building initiatives in India. Lessons learned from previous national missions such as the Jawaharlal Nehru National Urban Renewal Mission (JnNURM) were incorporated, including 18 studies on training needs assessments of urban local bodies (ULBs). Thirteen Shit Flow Diagrams (SFD), existing state-level sanitation strategies, and city sanitation plans (CSP) were all used to further identify country-wide trends and clarify points of departure for developing the templates to be used to guide focus groups and interviews at the state and citylevel. Meetings were then held with the eight SCBP partner organisations.

The partners were identified based on 10 criteria including each partner's capacity building mandate and their decentralised sanitation experience within India. All eight partners have experience working with capacity building, ULB support or decentralised sanitation. Their observations of the implementation challenges provided a baseline of the barriers that exist throughout Indian cities and were used to corroborate key challenges identified within existing research.

The key challenges were divided into four main areas — managerial, technical, financial, and institutional level capacities. These were then sub-divided into 21 main challenges, including but not limited to staff turnover, lack of motivation, understanding of decentralised sanitation, contract preparation, competing priorities with centralised solutions, land availability, and lack of institutional capacity and resources.

The findings were consolidated and used to develop a series of questionnaires to guide meetings with the various stakeholder groups involved at both the state and citylevel in the provision of FSSM. Stakeholder questionnaires included questions to gauge each group's knowledge about sanitation, particularly decentralised solutions such as FSSM and decentralised waste water treatment systems (DEWATS), their attitudes toward such solutions, and the current designs for the city's on-site sanitation technology (OST) (eg. latrine, septic tank, etc.) and management practices. The list of tools includes:

- Needs assessment agenda and outline
- Data collection templates
- State-level officials (interview/ focus group guide)
- Commissioners or city-level officials (interview/ focus group guide)
- General municipal staff / orientation meeting (questionnaire)
- Health department (interview/ focus group guide)
- Engineering department (interview/ focus group guide)
- Masons/ Installers (interview/ focus group guide)
- Emptiers (interview/ focus group guide)

State & City Visits

The final phase of the needs assessment was to conduct visits to the states and cities to directly explore their needs in terms of sanitation, make observations, and to identify and reach ULB stakeholders involved in sanitation service delivery. Representatives of the SCBP from NIUA and CAWST met first with officials in each state capital to understand the FSSM mandate of the state, the level of support available to the ULBs, as well as to orient state officials in order to facilitate meetings with officials at the city level. State level officials included those responsible for state level sanitation planning such as the coordinators for Swachh Bharat and AMRUT missions, senior technical advisors, and engineers to assess the FSSM knowledge and interest of the state.

Capacity Needs Assessment: Addressing Urban Faecal Sludge and Septage Management

At the city level, SCBP representatives were interested in meeting the City Commissioner responsible for city planning, the Mayors who typically influence what infrastructure is built in the city, and city engineers or staff from health or engineering departments to gauge their understanding and experience with FSSM. City OST masons and/or installers, and the OST service providers such as emptiers were also interviewed where possible.

Challenges and Limitations

Several key lessons were learnt during the state and city visits. Attendance varied greatly, the time granted was often delayed and shorter than the time assigned, and the movement of attendees to and from meetings restricted their structure. As a result, data collected varied in quality and quantity depending on the city and state. We quickly realised the benefit of using the questionnaires to guide these initial discussions rather than restrict the exchange to only those questions on the template. This allowed us to adapt conversations to gather the most information possible within a short timeframe.

Findings

City Level

Despite some of the challenges reported to us, six common FSSM implementation barriers were identified in the ULBs. These included land availability, motivation to implement or accept decentralised sanitation solutions, capacity in terms of the number and qualification of staff in the municipality to support FSSM implementation, OST installation and management referring to OST design and emptying frequency, knowledge management (i.e. availability of sanitation related data), and competing priorities such as the construction of sewer networks and centralised waste water treatment and solid waste management.

Land availability was identified as a major barrier to the implementation of FSSM due to the lack of space for both Faecal Sludge Treatment Plants (FSTPs) and individual household septic tanks and latrines. Five of the six cities mentioned that land availability was a concern in terms of constructing a FSTP. In two cities, land had been allocated for the construction of a STP, and in both of these they expressed their flexibility to re-allocate the land for an FSTP, pending the timeline of the FSSM project relative to that of the centralised system.

Demonstrated interest in FSSM and capacity building were the second most cited challenges. Based on these considerations, three of the six cities were identified as promising, as they expressed interest in working with the SCBP to plan and deliver FSSM services and on their having the necessary staff available to do so. With these three cities, SCBP partners will be involved in a more targeted assessment specific to the identified capacity gaps. In the remaining three cities, it was clear that sewer networks and centralised treatment are currently a priority over decentralised solutions.

Stakeholders Level

District Magistrate

The District Magistrate of Unnao was supportive of the need for addressing faecal sludge waste. She offered all support from the district. The smaller Ganga basin towns of Unnao and Hajipur will need the support of the district administration for securing treatment plants at the outskirts of the municipal boundaries. And where more than one small town is in close proximity, securing a solution for FSSM for one small town alone may not be the best way forward. The District Magistrate/ District Collector buying into the FSSM priority of a town is essential.

Commissioners and Executive Officers

Commissioners and Executive Officers tended to be more aware of and interested in the plans related to centralised waste water collection and treatment, with the exception of the Commissioner in Bhagalpur. In Gudur and Ghazipur, the Commissioner and Executive Officer, respectively, had been newly transferred to the municipality and had little knowledge of their cities' sanitation infrastructure and management needs, indicating a need for institutional memory.

Municipal Engineer

In three of the six cities, the Municipal Engineers were knowledgeable about the status of latrine and septic tank coverage within the city. Their ability to speak about open defecation and their progress under SBM indicated that the need for 'toilets' is recognised. The municipal engineers were able to estimate the number of OSTs; they also gave some information about emptying services within the city, including in some cases those services provided by the ULB. The use and quality of these emptying services, however, were less known. The absence

Table 1: Sanitation landscape information collected from each city

	Bihar		Uttar Pradesh		Andhra Pradesh	
	Bhagalpur	Hajipur	Unnao	Ghazipur	Prodattur	Gudur
Population	412,209	400,146	177,658	121,020	163,970	147,688
No. of households (HH)	68,193	23,280	31,042	18,158	38,585	19,811
% of HH with flush/ pour flush latrines connected to septic tank	55.7	55.2	57.5	67	52.6	58.1
% of HH with flush/ pour flush latrines connected to piped sewer system	6.9	6.6	19.7	11.3	14.2	7.5
% of HH with other systems—insanitary latrines	19.1	12.4	6.2	2.4	26.0	4.9
% of HH having access to public latrines	2.5	2.1	0.8	1.2	1.8	0.5
% of open defecation	15.8	23.7	15.9	18.1	5.5	28.9
Other OST	Unknown	Unknown	Toilets directly connected to drains	Unknown	13% pit latrines	Unknown
Estimated OST -desludging period	5-10 years	8-10 years	10 years	3-4 years	3-5 years	Unknown
Estimated desludging cost per trip	INR 1600-2000 (municipality) INR 400-500 (owner/private agency)	INR 1000-1500 (private agency)	INR 750 (municipality) INR 850 (private agency)	INR 1000-2000	INR 2000-2500 (private agency)	Unknown
Current FS disposal	No treatment; dumping on open land/ water bodies	No treatment; dumping outside city	No treatment; dumping into drains	No treatment; dumping outside city	No treatment; dumping on open land/water bodies	No treatment; open dumping
Number of public toilets	0	Unknown	6 (each with 6 toilets)	Unknown	10 community; 9 public toilets	Unknown
SBM status	HH survey to assess sanitation needs & access	Construction of single pit prefab concrete ring latrine (unlined bottom)	2380 applications received	Nothing started as of 12 August 2016	979 individual HH toilets (IHHT) built, 158 IHHT in progress & 181 IHHT expected	Constructing double chamber septic tanks in partnership with local trust
Land available for FSTP or DEWATS	Yes	Potentially; land is allocated for solid waste	Yes	Unknown	Potentially; land is allocated for STP/sullage treatment plant	Yes

of treatment or proper disposal options indicated that the need for FSSM was not a critical concern. Even though a large portion of households in each city was served by OSTs, all of the ULBs conveyed either primary interest in centralised waste water collection and treatment as a potential solution, or indifference to FSSM. There were no engineers or required staff in the Ghazipur ULB.

Masons, Installers and Emptiers

Masons or OST installers and emptiers were particularly difficult to locate and interview. In Prodattur the SCBP representatives were able to meet with one mason within in the city. Meeting with masons and installers to better understand the variability of design and quality of OSTs in various **cities is imperative to understanding the challenges faced by those responsible for the design, implementation, and management of OSTs.**

Table 2: Summary findings and recommendations at the stakeholder level.

Stakeholder Group	Challenge/Gap	Description	Recommendation
Masons/Installers	On-site Sanitation Technology Planning & Implementation	There is high variability in the quality and type of the on-site sanitation installation designs being implemented. Generally, the septic tanks are under sized and the baffles located incorrectly within the tank. Current configurations force the influent to flow along the bottom of the tank, typically where solids settle. Given this configuration, solids are disturbed with every use, interrupting the primary purpose of the tank. Instead, a mix of the solid and liquid fraction is able to leave the tank, which can cause clogging in the outlet and the receiving drain. In terms of pit systems, many are unlined, which can have direct public health impact on the homeowner's water supply and generally on the environmental health of the community.	• Focus groups/interviews should be conducted to better understand the barriers to proper design and construction in order to inform decisions to build an ecosystem that fosters correct and quality design and installation of latrines and septic tanks. • The results should inform the development of on-site sanitation installation design and construction workshops, and should be offered to address the identified barriers to proper design, and also provide an opportunity for masons and installers to become certified installers of SCBP.
Regulators	On-site Sanitation Technology Planning & Implementation		• Local regulations/guidelines that control and enforce quality installation of on-site sanitation technologies. A purely educational approach to incentivise the proper design and construction of these systems may be insufficient.
Emptiers& On-site Sanitation Technology Service Providers	On-site Sanitation Technology Management	There may generally be a lack of incentives for proper construction and system operation. The desludging rate is estimated once every 5-10 years. This frequency seems relatively low and may impact the function of the system causing faecal sludge to leak into the environment once the system has filled. Additionally, manual scavenging still appears to be a common practice in Bhagalpur.	New and different management strategies will need to be considered to improve the function of the on-site sanitation systems. Aspects such as the application process for desludging services should be revisited and better understood in order to make revisions. Trainings/workshops to target masons and installers to ensure the proper installation of future sanitation technologies may improve their long-term function as well as the tanker/emptier access to those systems. Additionally, financial models that incentivise home owners to use legal services and incentivise emptiers to dump in the appropriate facilities should be investigated to mitigate these improper practices.

Stakeholder Group	Challenge/Gap	Description	Recommendation
State-level, Commissioners & City-level Officials	FSSM Motivation/ Interest	The City Commissioner was clearly not interested in FSSM and expressed concern that it would not be well received by the public.	Behaviour change activities and buy-in are required before progressing with the planning and implementation of FSSM. More information is needed to illustrate how FSTPs and STPs can complement each other and how typically several strategies are employed at a city level to achieve complete sanitation coverage. Additionally, more information on the financial incentives of FSSM may be useful in convincing the DM on the value addition of FSSM.
Commissioners & City-level Officials	Land Availability		To better address these challenges, SCBP will need to engage more closely with masons/installers as well as system service providers to understand from their point of view the barriers to implementing sanitation systems and system desludging, respectively.
Commissioners & City-level Officials	Competing Priorities	Since land is limited, the construction of the STP could possibly interfere with the construction of an FSTP because the land currently allocated for the STP was discussed as the land option of the FSTP.	
General Municipal Staff, Installers, Emptiers& Engineers	Knowledge Management		Knowledge management capacity building activities may be useful at the city level.

Faecal Sludge & Septage Management: Challenges for Small Urban Local Bodies

A few capacity needs assessment studies have been done for ULBs for urban sanitation. Most of the findings of these studies reiterate common lacunae: lack of adequate staff and their bourgeoning workload, poor financial health of the ULBs, and priority accorded to other civil and administrative functions.

The purpose of undertaking this FSSM needs assessment was to support the roll-out of the Sanitation Capacity Building Programme (SCBP) anchored by NIUA and in partnership with credible national level resource agencies in FSSM promotion. The aim of SCBP is "Demonstrating Effectiveness of FSSM in India" by undertaking a range of capacity building interventions.

This report is based on assessments done for six towns—Unnao and Ghazipur in Uttar Pradesh, Proddatur and Gudur in Andhra Pradesh and Hajipur and Bhagalpur in Bihar. Conclusions and recommendations drawn in this sectionare further strengthened by the following practical interventions done by NIUA and SCBP partners from July to December 2016:

- A pilot capacity building programme conducted for select ULB staff at the Devanahalli FSSM plant in Aug 2016 and formalised with organised institutional training delivered in partnership with Regional Centre for Urban and Environmental Studies (RCUES) Lucknow.
- Development and administration of the Rapid Assessment Tool of MoUD for 61 AMRUT cities of Uttar Pradesh to prepare budget estimate for FSSM treatment plants.
- Knowledge resource and experiences of SCBP partners— FSSM capacity building priorities identified for NIUA by partners of SCBP.
- FSSM diagnostics assessments and DPR work in two towns of Bhagalpur and Unnao.
- Engagement with the state parastatal agencies like Uttar Pradesh Jal Nigam and the state nodal AMRUT PMU.
- Inputs and partnership as part of the National Faecal Sludge and Septage Management Alliance (NFSSM).

Small towns with populations typically less than 100,000 are characterised by an absence of sewerage network (in some instances work may have been started and STPs built, but these are not operational) and a lack of solid waste treatment facilities. These towns have a low revenue base and depend on state government financing. Often the District Magistrate is a more influential decision making administrative authority than the Executive Officers of these towns.

Diagram 1. Empowering the Urban Local Bodies for Septage Management

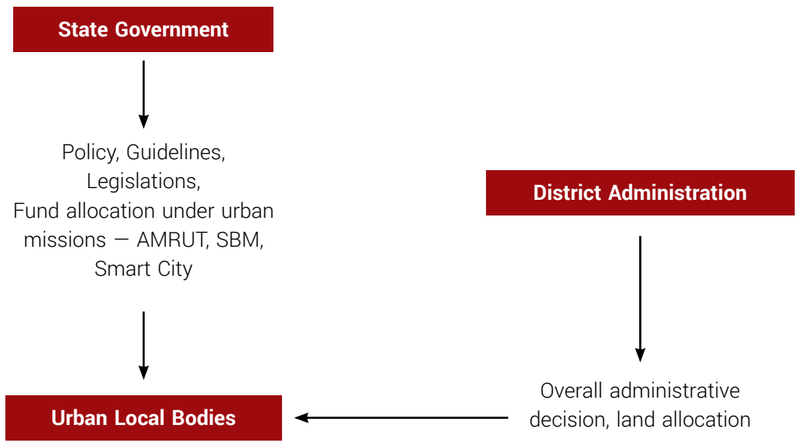


Diagram 2. Small Town ULB Sanitation Team Organogram

During the assessment we found that there is a resistance to FSSM treatment solutions from the parastatal agencies and engineers, arising from the belief that FSSM treatment plants are sub-optimal solutions as compared to sewerage treatment plants. Most of the small towns we visited had made DPRs for sewerage treatment plants but the work had not been completed or these were dysfunctional.

In the absence of policy commitment at state level for addressing the growing problem of septage generation, all the septage generated in a town is now flowing out into the drains as effluent and polluting water bodies or is being taken out and dumped in open lands outside the towns.

In the smaller Ganga basin towns like Hajipur, we

observed that lack of effective drainage has led to a situation where people are building septic tanks as soak pit toilets.

Given the challenging state of septage management and treatment, a more enabling policy environment is needed for promoting decentralised waste water treatment solutions that can be owned and operated by small towns. The recent notification from the Ministry of Environment and Forests for more stringent BOD norms for sewerage treatment may not help in addressing the challenges that small towns face in septage treatment.[3]

Many small towns are now applying for Sewage Treatment Plants (STPs) to be funded under National Mission for Clean Ganga (NMCG). The DPRs for the STPs are being prepared by state level parastatal agencies like Uttar Pradesh Jal Nigam in Uttar Pradesh and the Bihar Urban Infrastructure Development Corporation (BUIDCo). The cities don't have much say in the location, planning or running of these STPs.

Emptying of septic tanks and conveyance of sewage in small towns is undertaken by small operators and there are no treatment facilities for septage and sludge. Unless scheduled regular cleaning of septic tanks is introduced and treatment facilities for dumping identified, it will be impossible to attract the private sector to do this job.

In terms of workload, the sanitation team of a small town is primarily engaged in handling solid waste, street sweeping and cleaning and drainage maintenance works. Executive officers for small towns may be holding dual charge for more than one town. Many small towns do not even have a single dedicated junior engineer for the sanitation work, eg.in Ghazipur, Uttar Pradesh, a tax inspector was in charge of the sanitation related work.

Keeping the town markets and residential areas swept and cleaned and ensuring drainage flows is the priority. Septage management is hardly addressed. There is no record kept for the work done by private sector desludging tankers. The practice of overseeing and monitoring the construction of household septic tanks as per norms, that was once a priority of the ULBs, is not done anymore. Though some of the ULBs like Bhagalpur, Hajipur have their own trucks/sludge suction machines, they rarely use them as they don't have any disposal or treatment facility.

As more and more Indian towns and cities achieve Open Defecation Free (ODF) status, the challenge will shift towards addressing the safe containment, treatment and disposal of faecal waste. Most Indian towns will not be able to afford and implement large capital intensive Sewage Treatment Plants (STPs) in the coming decade. Urban population growth will constantly put pressure on any STPs to meet the growing demand. Given that two thirds of India is semi arid, there will not be enough water for covering all the urban population with STPs. Septic tanks and septage will remain a challenge for the coming decades. Hence it is critical that states and ULBs in India start addressing the growing challenge of addressing the treatment and disposal of septage (and also the waste generated from STPs).

Key Issues and Challenges at Town Level

- There is an absence of credible estimates of the type of septic tanks in a town. It is difficult to assess the volume of sludge generated and the frequency of cleaning of septic tanks and hence the treatment potential and options.
- However there is a growing realisation at the town level that dumping of septage waste in an indiscriminatory manner will not be possible in the near future. In some towns there is poor drainage and septic tanks are being used as soak pits.
- Over flowing drains with faecal waste that empty into water bodies, rivers or in open fields are a major concern for all residents of towns.
- Parastatal agencies still consider Sewage

[3] *http://envfor.nic.in/sites/default/files/Draft%20notification%20of%20Sewage%20Treatment%20plan.PDF*

Treatment Plants (STPs) as ideal solutions and decentralised faecal sludge treatment plants as sub-optimal solutions. Decentralised FSSM treatment solutions are yet to be accepted as effective and perhaps more appropriate faecal sludge treatment solutions especially for water starved and poorly financed urban local bodies.

- In most small towns Sewage Treatment Plants (STPs) are either non-existent or are non functional.
- Small ULBs are under staffed for critical positions and do not have powers of enforcement.
- Elected office bearers such as the Chairman and Mayor of towns are more positively tuned to the growing problem of unsafe disposal of faecal waste and the need for its treatment. They need to be tapped into any capacity building initiative on FSSM.
- FSSM has to be situated within the larger context of solid and liquid waste management of a town, and solutions sought under an integrated approach instead of separate solutions.

Capacity Needs Assessment: Addressing Urban Faecal Sludge and Septage Management

Recommendations

There are obvious gaps in the understanding, knowledge and capacity of town level functionaries regarding safe containment, collection and transportation and treatment of disposal of faecal waste, at all levels. However capacity building for FSSM cannot be a formal classroom training initiative focusing on septage management alone. Generating demand and awareness for addressing the faecal sludge management challenge should be the first priority.

Development of a state FSSM policy provides an enabling environment for urban local bodies in the towns to initiate projects for treatment of septage, other than sewerage treatment options.

There is a wide range of technology options for treating septage waste. Decentralised low cost solutions are the most affordable in terms of capital and operations and maintenance costs. However the choice of technology option should be left to the ULBs. More attention should be paid to developing capacity of the ULBs pre and post treatment scenarios. How to operationalize incremental improvements in septic tanks design and improving their efficiency of treatment, in developing norms and incentives for timely de sludging operations, for safe handling of septage and its ultimate disposal and reuse for agriculture.

State governments are keen to initiate pilot projects for FSSM treatment solutions as complementary to sewerage systems. Capacity building for FSSM should be for all stakeholders including the government, private sector and NGOs.

A lot needs to be done to ensure the aims of the National Urban Sanitation Policy and the National FSSM policy are met. This capacity needs assessment report provides detailed set of recommendations for the SCBP programme, what could be the priority focus for FSSM capacity building in general and for State governments and the ULB.

Key recommendations are divided into 4 sections. Detailed recommendations are in the main report.

1. SCBP Strategy for FSSM Capacity Building

Different states may need different approaches for capacity building. What works in one state may not work in another, given the varying geographical, socio-economic, administrative and sanitation status. This section tries to capture the key conclusions and recommendations that need to be applied with discretion.

- Not only are most ULBs under staffed for core functions, but also there is a large turnover at the higher level of Commissioners and Executive Officers and engineering staff. **Capacity building for FSSM cannot be positioned for only a few ULB staff ; it has to be state wide for all sanitation and parastatal water and sanitation agency staff.** The aim should be to orient and train at least 60% of all the middle

and junior level staff of towns and cities of a state (Executive Officers, engineers and sanitation inspectors) for a basic conceptual understanding or reorientation of waste water and septage characteristics, sanitation and health correlation, technology options, financing and contracting, O&M, norms and regulations, and best practices.

- **FSSM capacity building is more than formal classroom based training; it should incorporate a set of activities based on capacity building support.** For example, undertaking assessments of towns and cities of the faecal sludge generation and treatment and disposal is a good activity that informs the orientation and understanding of ULB staff of non-sewered treatment options that are at par with, and not sub-optimal solutions to sewerage systems. A few model detailed project reports (DPRs) should also be prepared to identify practical solutions to typical social and climatic environments. Social behaviour change for FSSM will also require specific capacity building input.
- **Formal training modules for FSSM capacity building should start with a basic FSSM exposure and orientation** for higher level ULB functionaries and elected representatives through the monthly AMRUT and SBM programme review meetings held at state level. These should be followed by integrating with ongoing AMRUT trainings, where FSSM complements the traditional sewerage training modules.
- **State nodal training institutes are best suited to deliver the FSSM capacity building work.** They, however, need support from credible sanitation sector agencies. Partnership with existing universities/IITs/research institutions/ international institutions like UNESCO[4] will also help in developing certification courses in future and in integrating FSSM in their academic work.
- **Hands-on support for implementing incremental FSSM improvements at town level will be a critical capacity building input.** Capacity building is most critical for addressing barriers in making small incremental improvements in norms for septic tanks and collection and disposal of sludge.
- **National level urban sanitation research and advocacy needed.** Capacity building inputs will be meaningful if backed by sound research and by all stakeholders and citizens. Case studies and learning material development in all formats (print, audio-visual, inter- personal and social media) – need to be based on verifiable and not anecdotal understanding of septage challenges. Developing enabling norms, rules and regulations for Public Private Partnership (PPP) designated desludging operations and plant operating solutions will help build the required capacity.

2. Priority Capacity Building Areas for FSSM

Capacity building needs of different stakeholders in the urban sanitation space should be addressed. A basic orientation and awareness of core concepts, challenges and technology options in addressing FSSM is essential in order to achieve the aims of the 2017 FSSM Policy.

- **Technology options for FSSM** should be left to the ULBs to choose from what is available in the market
  - » Orientation and training in all types of technology options, including mechanical and gravity flow systems, should be given.
  - » There is no single technology option for treatment of on-site sanitation solutions. It is best to provide a menu of options and the town/city can choose based on their financing capacity.

- **Develop Financing options for setting up Faecal Sludge Treatment Plants (FSTPs)** needed and capacity of ULBs for assessing them.
  - » FSTPs are a new initiative. So far the institutional and financial framework for setting up sewerage plants is well established in each state. This is not the case with FSTPs.
  - » The range of financing options needs to be explored, opportunities identified and communicated to the ULBs in capacity building interventions.

- **Use appropriate frameworks and tools for sanitation planning for FSSM,** depending on ULB capacity and needs.
  There are several approaches and tools developed for this including a rapid assessment tool by the Ministry of Urban Development for assessing the septage treatment volume and budget required. Some of the other approaches and tools include: City Sanitation Planning under the National Urban Sanitation Policy, the Community Led Urban Environmental Sanitation programme (CLUES), Whole System Approach (IRC), Shit Flow Diagram (SFD), SaniPath (Emory University), FSSM Tool Box (AIT), SaniTech (C Step), etc. The SaniPlan (CEPT University) is a planning and decision making tool that provides the following steps[5] :
  - » Assess the existing FSSM service chain at town level to identify gaps in – containment, collection, conveyance, treatment and disposal/ treatment/ reuse of septage and faecal sludge.
  - » Compare it with existing service level benchmarks and arrive at realistic targets for FSSM treatment.
  - » Formulate a vision for faecal sludge and septage management for the town.
  - » Identify improvement actions needed at town level for–process, policy, infra-structure improvement and for new infra-structure.
  - » Prioritise actions and interventions – select from policy, technology, capital cost, operating cost, revenue etc.
  - » Develop norms that are enabling and not restrictive for private sector operations, but at the same time ensure incremental improvement.

- **Integrate FSSM into the Service Level Benchmarks (SLBs) for urban local bodies' performance rating**
  - » This is required to ensure greater understanding of the value of FSSM and its adoption at town level.

- **Developing appropriate training modules**
  - » Training modules for junior and middle level staff. One day FSSM orientation training modules for junior and middle level officers (executive officers and the engineer cadre of ULBs and parastatal Boards). Integrate FSSM training into AMRUT and other capacity building training at state level for mass promotion and awareness of FSSM.
  - » Training modules for senior staff. Short FSSM training modules (half day) for senior officers (Commissioners, Collectors and state level SBM and AMRUT nodal officers). Conceptual level training content for senior officers can include the following:
    - Understanding of basic concepts and terms in sewerage and septage treatment; black and grey water challenges
    - Planning for FSSM – different tools and approaches
    - Best practices/projects
    - Service level benchmarks
    - Financial planning and evaluation of DPRs for faecal sludge treatment plants
    - National and state sanitation and FSSM policy frameworks
    - Capacity building though learning events, workshops and experience sharing case study conferences – an ideal medium for senior officers
  - » Capacity building of masons and the private unorganised sector engaged in construction of septic tanks and provision of sanitation services.

[4] *http://envfor.nic.in/sites/default/files/Draft%20notification%20of%20Sewage%20Treatment%20plan.PDF*

[5] *SaniPlan approach developed by CEPT*

Capacity Needs Assessment: Addressing Urban Faecal Sludge and Septage Management

- Practical and classroom based training modules
- Exposure visits

» Capacity building support to private sector and contractors providing packaged sanitation solutions.
- Creating platforms/markets/events to learn and also to share each other's technology and work
- Providing opportunities to engage with government, academia, citizens and consumer groups to facilitate improvement in services and technologies offered
- Exposure visits

» Elected representatives, NGOs and civil society to engage with urban sanitation and septage management.
- Orientation courses
- Longer training modules and learning opportunities for staff
- Exposure visits
- Platforms for engagement with all stakeholders at town and state level
- Exposure and orientation for Mayors and elected representatives

AMRUT has an ongoing three phase module for capacity building on all the thematic areas of the programme. The following can be incorporated into the second phase:

1. FSSM orientation module (preferably a one-day module) consisting of the following topics:
   » Introduction: Definition of FSSM (septage and sludge); challenges; and setting the context for what needs to be done
   » Planning for FSSM: Exposure to tools and templates for FSSM planning; measurement of faecal sludge generated at town level; understanding the value chain of FSSM
   » Technology options: For collection, conveyance and treatment
   » Contracting and O&M
   » Regulation and norms for FSSM
   » Benchmarking in urban sanitation and FSSM
   » FSSM Policy Framework: state and national levels

2. Advanced training module and exposure visit for select ULBs who show interest in and promise to undertake FSSM interventions in their towns. The module should aim at generating the following outcomes:
   » Preparation of town level FSSM intervention plans based on data of their own towns and a couple of technology options
   » Identification of specific incremental interventions for improving FSSM

3. FSSM Certification Course (4-6 weeks) for ULB staff who show interest and are assessed and recommended for applying to universities and national institutions like IITs, NITs, IIMs, NEERI, other universities, research institutes etc. This should be linked to career advancement as an incentive. UNESCO is also developing a one year post-graduate certification course in FSSM. Online courses on FSSM are also provided by international and national organisations and NGOs.

3. Priorities for FSSM Promotion by the State Governments

According to the FSSM Policy 2017, state governments are required to plan and implement capacity building of ULB personnel and orientation of elected representatives on all aspects of FSSM through appropriate strategies and setting up of city sanitation task forces.

Capacity building for FSSM can target the following priorities (in the development and delivery of training modules and other related programmes) for the state governments to attain optimum FSSM outcomes:

- **Have an incremental framework for addressing sanitation and FSSM**. States should aim to achieve open defecation free (ODF) cities and then ODF + and ODF ++ as demonstrated by Maharashtra. FSSM will come under ODF and ODF ++.
- **Provide an incentive fund** for ODF cities to adopt FSSM.
- **Strengthen systems at state level to enable FSSM and sanitation uptake**.
  » Empanel existing private sector operators in the sanitation business that provide solutions for latrines, urinals and treatment options for septage, including FSSM operations. This will enable ULBs to engage their services.
  » Create state funding mechanisms for capturing CSR funds to be used for sanitation and FSSM.
- **Strengthen the ULBs** by creating a cadre of permanent professional staff for town planning that can also handle FSSM. In the absence of permanent staff hiring, facilitate hiring of professional staff of town planners and managers at state level for ULBs to support them in planning and implementation.
- **Enable state level FSSM policy environment** — the first step required to promote FSSM in small towns in India. The states of Maharashtra, Orissa and Tamil Nadu have come out with operational guidelines and policies for faecal sludge management and treatment.
  » FSSM should never be planned in isolation or on a standalone basis. FSSM must be made an integral part of providing city-wide sanitation solutions.
  » Promote simple low-cost faecal sludge treatment options. Notify disposal of faecal waste dumping sites where treatment facilities are not in place.
  » Develop rules for handling and disposal of faecal sludge.
  » Institute penalties and rewards for desludging operators— tax breaks for truck operators who do the job properly and fines for those who dump the stuff indiscriminately.
- **Develop a state FSSM strategy and mechanism** to achieve incremental FSSM improvements starting with a few towns and expanding phase-wise to all towns and cities of the state.
  » Develop a funding mechanism to promote FSSM at state level.
  » Facilitate the leasing out of land and finances for setting up a few FSTPs in different typologies of towns and cities.
  » Identify and recommend incremental FSSM improvement activities for ULBs to implement immediately.
  » Initiate a few pilot projects on FSSM treatment plants as model demonstration projects and for capacity building and learning.
  » Ease procurement of contractors for FSTP solutions. Undertake empanelment and costing of services.
  » Recommend FSSM treatment options and norms for ULBs: FSTP plant options, desludging operations of septic tanks, property tax reforms and norms for collecting additional tax revenue for septage and FSTP operations, legal support.
- **Institute state level reforms and laws** for enabling FSSM.
- **Ensure clarity of roles and responsibilities** among different parastatal nodal agencies for implementing FSSM solutions and for managing operation and maintenance.
  » Provide an administrative mechanism for addressing conflicts of roles and responsibilities.
- **Undertake a state-wide FSSM capacity building and orientation programme** for all towns of the state and use AMRUT funding for this activity.
  » Identify a nodal state training institute for training and capacity building for FSSM. Invest in developing its faculty capacity to deliver training modules, have tie-ups with existing credible national level agencies for support.
  » Orient and engage the District Magistrates for FSSM promotion.
  » Create opportunities for city officials, especially the engineering staff for exposure visits and learning and orientation

for FSSM. So far, the engineering cadre only knows septage treatment plant technology and costing options.

» Senior level Commissioners and city managers need to be provided training on understanding DPRs and financial models for FSTPs.

» Incentivise city officials to undertake formal certification courses provided by credible national agencies and also by universities, the IITs and the NITs. Have formal tie-ups with these institutions.

» Undertake capacity building plans for small towns — for training and orientation of sanitary inspectors and other staff and also for masons.

» Initiate regular learning events and workshops at state level or in collaboration with other states at a regional level, where ULB staff can come together and learn from each other's experiences.

4. Priorities for FSSM Promotion at the ULB/Town Level

AMRUT, SBM and Smart Cities guidelines will need to facilitate the prioritisation and implementation of FSSM actions at the ULB level.

Capacity Building for FSSM can target the following priorities (by targeting the development and delivery of training modules and other related systems) at the towns/cities and ULB level to attain optimal FSSM outcomes.

- **Situate FSSM in the larger urban planning and sanitation context** within a city for all aspects of liquid and solid waste management.
- **Undertake awareness activities for scheduled desludging/**regular emptying of household septic tanks.
- **Undertake capacity building of local masons** for septic tank construction and maintenance works.
- **Create a city level fund to capture potential sanitation funding** from CSR, donors and philanthropists.
- **Integrate FSSM solutions as part of the Master Plan or city sanitation plans of the town/city.** FSSM assessments and projects should be integrated into the city/town planning and also with the sanitation and solid waste management plans. A standalone FSSM planning may not work.
- **Undertake a sanitation census and mapping of towns that is just not a toilet census but also takes into account septage related variables:** existing toilets, the types of septic tanks, including their holding capacity, type of construction, their cleaning frequency, septage conveyance and disposal, including the existing trucks, workers and sites for disposal etc.
- **Undertake assessment of the FSSM/septage status** of towns and explore technology and solutions.
- **Initiate FSSM improvement actions**
  - » Issue appropriate guidelines and norms for septic tank construction and regular desludging/cleaning operations.
  - » Introduce a verification and approval process for new septic tank constructions.
  - » License sludge operators to ensure they operate with minimal safeguards for their workers for cleaning of septic tanks, preventing indiscriminate dumping of faecal sludge, and identifying designated dumping sites till a treatment plant comes up.
- **Understand national and state level norms and guidelines and parameters** for construction of septic tanks, planning for decentralised solutions for septage management, including regular desludging operations, norms and regulations for discharge of waste water.

We hope this report and recommendations will serve as a useful guide to all the partners of the National Faecal Sludge and Septage Management Alliance (NFSSM Alliance), to all the stakeholders in the state governments and ULBs, and contribute towards addressing the FSSM challenge for India that is part of the sanitation and health challenge.

Capacity Needs Assessment: Addressing Urban Faecal Sludge and Septage Management

Annexure 1: Bihar

PATNA

Visit Dates: 11 July, 2016

Visiting SCBP Representatives

Paramita Dey (NIUA)
Lee Boudreau (CAWST)
Sterenn Philippe (CAWST)
Ankita Gupta (NIUA)
Jyoti Dash (NIUA)

State Officials Visited

Principal Secretary: Mr. Chaitanya Prasad
State SBMG Team/Monitoring & Evaluation Officer for Namami Gange: Dr. Nikhil Ranjan
State SBMG Team/Environmental Specialist: Ms. Shubhanjali Saxena
Senior Civil Engineer/SBMG: Mr. Anup
Special Secretary/SBMG: Mr. Sanjay Dayal

Discussion Notes

The state recently issued an RFP to hire a consultant to update the state-level sanitation strategy, which had originally been developed by DFID. While there was no official state-level strategy in place at the time of the SCBP visit, the state recognises that the costs — those to extend sewer networks, increase Sewage Treatment Plant (STP) capacity, and maintain current and future costs for operation and maintenance (O&M)—well exceed the financial ability of each ULB. As a result, the state-level officials showed support for decentralised sanitation solutions and mentioned that their support could influence the direction of the ULBs.

To date, many Bihar cities do not have sewer networks and centralised treatment facilities. STPs that do exist, function intermittently if at all. The state officials suggested that STP failures were due in part to the lack of finances for O&M as well as plant under-loading as a result of the quantity and quality of sewer connections. The state believes that this challenge is once again related to finances and geographical and housing density challenges of the communities to be served. Their main concern with a decentralised approach like Faecal Sludge and Septage Management (FSSM) was with principal implementation costs and the availability of business models to address ongoing O&M costs for the collection, transport and treatment of faecal sludge.

A couple of additional concerns were highlighted during the visit. The first challenge was that of land availability. ULBs do not own land. The state, on the other hand, does have land access but it is shared by different departments such as transportation, resources etc. Consequently, designating a specific plot for a project can be difficult because demand is high and because control typically falls in another department's jurisdiction. Other land challenges include ground water levels and the density of the communities and congestion that limit transportation access in each city. The second challenge related to the capacity of the ULBs. The state believes that the ULBs will be unable to innovate FSSM solutions and develop a DPR without the support of private partnerships. Furthermore, ULBs can potentially manage the contracted activities, but they do not have the capacity to procure consultant support. They suggested employing a help desk that could be located in the ULBs, but not run by them, to provide guidance to the ULBs through the planning, procurement, design, implementation, and operation stages.

The state also requested direct support from SCBP for planning, DPR, implementation and O&M, which includes ongoing monitoring. The Principal Secretary expressed hope that with the help of SCBP, Bhagalpur and Hajipur could be flagship cities in delivering FSSM.

It was the state's understanding that each ULB had already appointed staff to visit and survey every household in its city to assess the on-site sanitation technology (OST), i.e. toilets and pits or septic tanks, and needs that could be addressed under the Swachh Bharat Mission (SBM). Data on toilet/OSS availability, type, transportation access (measured as the width of the access road), and presence/absence of a drainage system has been collected. The information is with the SBM team and will be shared with SCBP representatives.

Lastly, the state officials expressed interest in the FSSM exposure visit and workshop. (Note: the exposure visit and workshop were offered August 22-23, 2016, and Bihar sent two state-level representatives.)

Challenge:

- Motivation of ULBs to implement FSSM may depend greatly on the mandate of the state. Need to develop the capacity of state officials and the SBM team. The state official specifically requested skills to develop FSSM business models that the cities could replicate.
- There is limited information on FSSM and decentralised sanitation solutions. More information (per their request) on the cost of FSSM compared to centralised systems — generally how decentralised sanitation systems operate and are managed in developed countries, specific information on bio-toilets (Ecosan systems) and functioning decentralised management strategies.

Capacity Needs Assessment: Addressing Urban Faecal Sludge and Septage Management

BHAGALPUR

Visit Dates: 11 July, 2016

Visiting SCBP Representatives

ParamitaDey (NIUA)
Lee Boudreau (CAWST)
Sterenn Philippe (CAWST)
Ankita Gupta (NIUA)
Jyoti Dash (NIUA)

City Officials Visited

Commissioner: Mr. Avnish Kumar Singh
AE/Bihar Municipal Corporation (BMC): Mr. Hare Ram Choudhary
Environmental Support Group (ESG)/BMC: Mr. Mahesh Prasad
City Manager: Mr. Vinay Prasad Yadav
Ward Councillor: Mr.Santosh Kumar

Sanitation Overview

*Percent of HH with septic tanks:*Unknown
Other sanitation systems: Unknown
Estimated septic tank desludging return: 5-10 years
Estimated desludging cost: INR 400-500 per trip (estimated owner-emptying cost) and INR 1600-2000 per trip (municipality cost)
Current FS disposal: No treatment; dumping on open land and water bodies
No. of public toilets: unknown
Status of SBM: HH surveys to assess sanitation needs and access
Land available for FSTP:Yes

Typical septic tank design and management process

Typically, homes have triple-chamber septic tanks, which are not constructed in accordance with existing guidelines. The septic tank floor is concrete lined and the walls are often brick but sealed to be as waterproof as possible. There are no community toilets or multi-household toilets, but in apartment complexes, the toilets in the complex are typically connected to one large septic tank. Masons construct the septic tanks, but there is no registry of masons or contractors with septic tank construction expertise. The number of masons is unknown and the quality of their work varies. If engineers are involved in the design of the system, the design is rarely followed in the construction phase. Their involvement is merely a formality.

Home owners contract a service to empty their septic tanks on average once every 5 to 10 years. To have the system emptied, the home owner generally submits a written application to the municipality, requesting the desludging service. The municipality charges about INR 1600 per trip. It is estimated that about 40% of the emptying is done illegally through manual emptying. The other 60% constitutes legal services that follow emptying guidelines or bye-laws. It was noted that manual, self-emptying can cost INR 400-500, which is why many households opt to do it themselves. The maximum cost quoted was INR 2000 per trip.

Discussion Notes

Discussion with City Commissioner

According to the Commissioner, the city plans to construct 1100 individual household toilets. 200 facilities have been built to date and the remaining number should be built over the next two years. Additionally, the city plans to build a community sanitation facility with 10 toilets. He mentioned using innovative toilet technologies, but the details of the technology were not available.

The ULB owns two tankers for emptying septic tanks. The cost of emptying is between INR 1600 and INR 2000 per trip. No disposal or treatment option currently exists, so service providers dispose of their sludge on open land, along the side of the road and in water bodies.

There is an existing STP and sewer network which is managed by Bihar Rajya Jal Parishad. The STP is currently inoperative and the network is outdated. To address this, a city-level sanitation plan was developed five years ago, which included a survey of the sanitation status within Bhagalpur and a detailed project report (DPR) for the construction of a new STP. The DPR did not receive funding due to the estimated budget to complete its construction.

Lastly, the Commissioner mentioned that the majority of the community is marwadi (business class), so he believes that the households have disposable incomes that could cover the tariffs basic for a functional FSSM system.

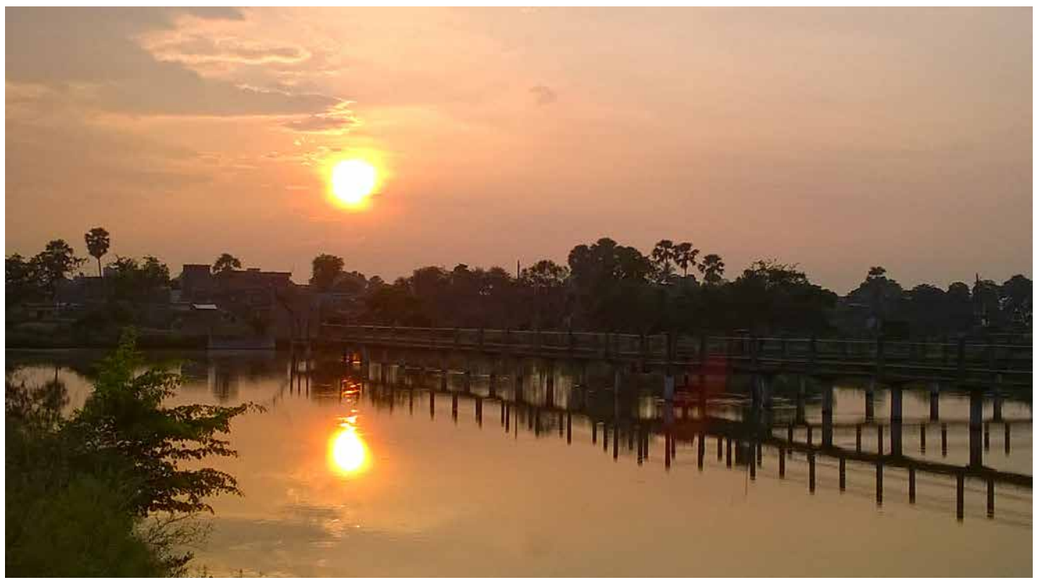
Orientation Meeting with City Officials

Bhagalpur is the first city in Bihar that was declared a Smart City. It is keen to make improvements in its infrastructure to showcase its new direction.

Bhagalpur currently does not have a treatment facility available for faecal sludge. As a result, emptiers typically dump the sludge in fields or on the side of the road. The city officials mentioned that in a few cases trenches have been excavated for dumping. Once they are filled, the material is then buried to reduce contamination. This is not a common practice and improper dumping has caused disputes within the city, though the municipality only involves itself when the disputes have escalated between neighbourhoods or castes.

In 1984, the 11 MLD capacity STP was built with UNESCO funding. The plant is located on a 3-4 acre plot of land north of the rail line near wards 17 and 9. The designed STP served about 50% of the population between1984-1990s, but today only serves about 20% of the total population. Population growth since the 90s has increased the waste water load and demand on the STP, exceeding the plant's design capacity. Yet the city speculates that the cause of the STP failure is due to lack of water in the network to transport sewage to the STP. Bhagalpur does have a few sewer lines, potentially leading to the underloading of the STP (not overloading). Furthermore, of that small number, many of the lines are clogged, rendering them useless or limiting their transport of sewage. The population in the communities/neighbourhoods located below the rail line also sit at a lower elevation relative to the existing STP. To treat their waste at the STP, it would require pumps to lift it and transport it to the STP's current location.

However, it seems that despite these flow and



connection challenges, the STP is generally poorly located. The current STP sits upstream of the water treatment facility, impacting the influent of that facility and the cost for safe water treatment. Bhagalpur has proposed a new STP, but would also like to keep the existing facility in operation despite its location.

Needs Identified

Challenge: **Competing priority**

- *Description*: There is a plan for a new STP.
- *Need*: It appears there are issues with the current infrastructure. While centralised solutions do not fall within the scope of SCBP, working to understand and complement these efforts will be important for success. Additionally, if land has been allocated for the STP, there may need to be a discussion about where to place the FSTP.

Challenge: **On-site sanitation system management**

- *Description*: Currently, the average desludging rate is estimated at once every 5-10 years. This frequency seems relatively low and may impact the function of the system causing faecal sludge to leak into the environment once the system has filled.
- *Need*: New and different management strategies will need to be considered to improve the function of the on-site sanitation systems. Aspects such as the application process for desludging services should be revisited and better understood in order to make revisions. Trainings/workshops to target masons and installers to ensure the proper installation of future sanitation technologies may improve their long-term function as well as the tanker/emptier access to those systems. Additionally, financial models that incentivise home owners to use legal services and incentivise emptiers to dump in the appropriate facilities should be investigated to mitigate existing improper practices.

HAJIPUR

Visit Dates: 19-21 July, 2016

Visiting SCBP Representatives

Depinder Singh Kapur (NIUA)
Jyoti Dash (NIUA)
Ankita Gupta (NIUA)

City Officials Visited

City Manager: Ms. Kanchan Kumari
Chairman: Mr. Haidar Ali
Vice Chairman: Mr. Nikat Kumar Sinha

Sanitation Overview

Percent of HH with septic tanks: Unknown
Other sanitation systems: Unknown
Estimated septic tank desludging return: Unknown
Estimated desludging cost: INR 1000-1500 per trip (private companies)
Current FS disposal: No treatment; dumping outside of city and in river
No. of public toilets: Unknown
Status of SBM: Construction of single pit unlined bottom latrines (using prefab concrete rings)
Land available for FSTP: Potentially land allocated for solid waste

Typical septic tank design and management process

Most existing systems are three-chamber septic tanks (see Figure 3 below). Single-pit latrines are currently being constructed under SBM. They use prefab concrete rings to construct the tank and the bottom of the tank is not lined. There was mention that septic tanks are not constructed due to the high ground water levels. Households depend on private emptiers who charge INR 1000 to 1500 for one trip. These emptiers then dispose of the sludge in the river/open spaces.

Discussion Notes

Discussion with City Manager & Vice Chairman

The city has a City Development Plan (CDP), City Sanitation Plan (CSP) and a DPR for a sewer network and STP. Copies of these documents were not available at the time of the SCBP visit. These documents are potentially available at the state or DFID office.

The city is lagging behind in the implementation of Swachh Bharat Mission. One of the main issues is the availability of land for construction of individual toilets and on-site sanitation technologies such as latrines and septic tanks. Though the ULB has its own tankers for emptying septic tanks, they do not offer the emptying service as they do not have any proper disposal/treatment site. As a result, households depend on private emptiers who charge INR 1000 to 1500 for one trip. These emptiers then dispose of the sludge in the river/open spaces.

Most existing systems are three-chamber septic tanks. Single-pit latrines are currently being

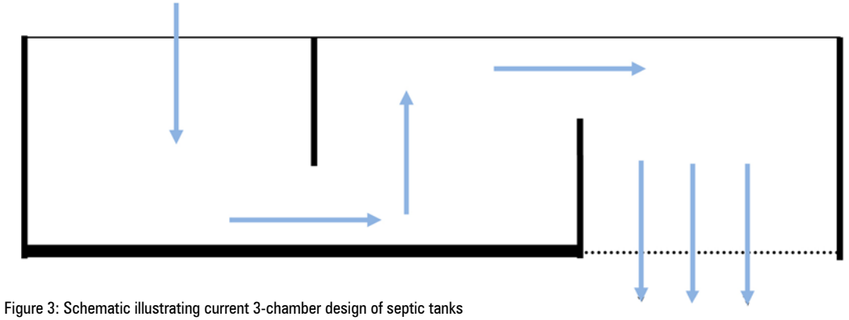


Figure 3: Schematic illustrating current 3-chamber design of septic tanks

constructed under SBM. They use prefab concrete rings to construct the tank and the bottom of the tank is not lined. There was mention that septic tanks are not constructed due to the high ground water levels. The water table in Hajipur is high given its proximity to the river. There was a discussion on how this feature limits the construction of septic tanks throughout the communities.

The ULB has 21 permanent staff. The City Manager and Executive Officer get transferred every three years. There are only two junior engineers who are on a contractual basis.

Discussion with Chairman

The city officials and city representatives are not involved in planning, design or implementation of the ongoing STP project. The layout of sewerage network and construction of STP is being done by BUIDCO who has been assigned the work by the state government. The Chairman mentioned that it was not necessary for the consultant to ask theirs permission even though they are working in the city. The state also does not take into consideration the feedback provided by the ULB regarding the quality of work done by the consultants.

Discussion with Project Manager, BUIDCO

A sewer network (198 km) designed to transport waste water to a 22 MLD STP is being built in Hajipur under the NMCG mission. Construction of the design started in 2011 and covers a 10.09 hectare area. The project has been delayed due to issues regarding availability of land for intermediate pumping stations. As the city is very congested only 26 percentage of the sewerage network has been completed.

Observation and extended community visit

The existing septic tanks do not appear to be properly designed. Due to congestion, they are often located under the house or directly under the toilet. While location does not always affect the system's function, direct location under a toilet may affect classification of the technology. What is being called a septic tank may in fact be a pit latrine. Many of the tanks lead to a sokta, i.e. a seepage pit through which the water from the septic tank is soaked into the ground. Sometimes the soak pit is the third chamber in a triple-chamber septic tank. The first two chambers are for storage of the sludge (the objective a traditional septic tank) and the third chamber, which is not lined, acts as the soil treatment unit which treats the clear liquid fraction from the septic tank through filtration. While the design may work, many of the systems are still located adjacent to or near the household's tubewell. The infiltration from the third chamber could directly affect the water being pulled from the well for consumption.

SCBP representatives were able to see one of the septic tanks under construction. The mason in charge has been constructing such tanks since 1989. The design he uses is the standard design for construction in the city. Typically, the systems are constructed as three-chamber systems where the storage and soakage pits are together or they have the storage pit near the toilet and the soakage pit located at a distance.

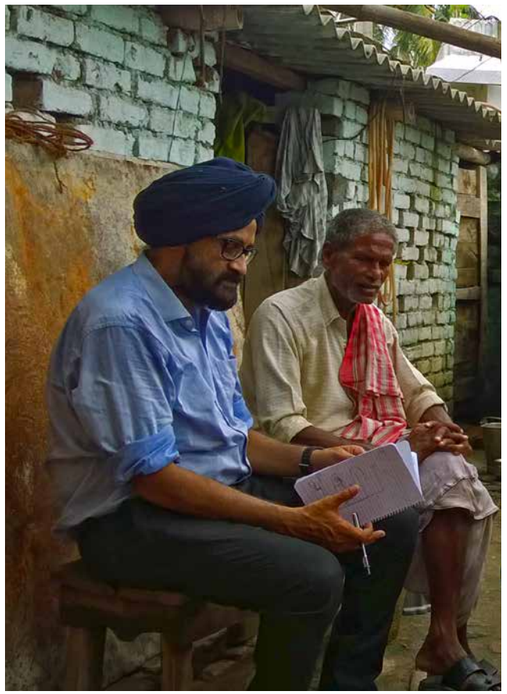
The construction cost of this three-chamber tank is INR 60,000 to 70,000. But people only get INR 12,000 under SBM. Typically, households opt to build single-pit tanks with prefabricated concrete rings over the three-chamber systems due to their cost and the limited available support by SBM.

Lastly, land availability is a major issue that affects the construction of on-site sanitation technologies and treatment facilities. Because the city does not have proper drainage, soak pits or other soil treatment units are necessary. Yet space is limited for these larger, more expansive systems. For the construction of a treatment facility, land is also limited. Hajipur, along with two other cities has, or is planning to, purchase land for solid waste management. It was mentioned that this land can also be used for FSSM.

Needs Identified

Challenge: Competing priority

- *Description*: Solid waste management is currently the priority for Hajipur as it relates to land allocation. Since land is limited, construction on that land solely for solid waste management could possibly interfere with the construction of an FSTP because the land currently allocated for solid waste management was discussed as the land option of the FSTP.
- *Need*: A discussion on land allocation may be needed if there is genuine interest in FSSM. If the city moves forward with using that land for solid waste management, a different plot of land would have to be identified.



Challenge: Onsite sanitation system management

- *Description*: It is unclear whether the existing septic systems in Hajipur are designed incorrectly. In the absence of a drainage system, it appears the mason has adapted his septic tank design to function more like a complete septic system, which consists of a sludge settling unit and a soil filtration unit to deal with the clear fraction.
- *Need*: More investigation is required to understand the design of septic systems in Hajipur and whether corrections or improvements in the design should be made. If the tanks do in fact function as systems, information potentially could be provided to encourage the three-chamber design over a single pit. This may be one way to address the challenge related to the absence of a drainage network. Placing a drainage network in the congested areas of the city where roads are less than 12 feet wide may prove difficult. More information is needed.

Annexure 2: Uttar Pradesh

LUCKNOW

Visit Dates: 20 June, 2016

Visiting SCBP Representatives

DepinderSingh Kapur (NIUA)
Ankita Gupta (NIUA)
Jyoti Dash (NIUA)

State Officials Visited

Secretary, Urban Development: Mr. S.P. Singh
Director, SBM: Mr. Rakesh Kumar Mishra
Additional Director, SBM: Mr. Vishal Bhardwaj

Discussion Notes

Land availability appears to be a major barrier limiting the construction of facilities to treat faecal sludge, according to Mr. S.P. Singh. To his knowledge, land is not available in the cities for a STP or FSTP construction. Without treatment, emptiers currently dump raw faecal sludge into the surroundings wherever convenient.

There is land available about 30 to 35 km outside of the city for the construction of a treatment facility. However, this would require households of smaller towns and cities to connect to sewers and convey their sewage to the STP of the larger nearby city. For example, Unnao is located between the two cities of Kanpur (industrial city) and Lucknow (state capital). Due to the industrial expansion of Lucknow, no land is available in the city to build an STP. Transporting faecal sludge in either pipelines or trucks, however, would be very costly.

Due to the size of Unnao and therefore the limited information available related to sanitation, the Executive Officer (EO) Mr. Mishra guided NIUA members to meet the District Magistrate (DM). He informed the DM of both Unnao and Ghazipur and asked them to co-ordinate with NIUA.

He also gave the contact details for the state SBM Director and UP Jal Nigam (the latter had developed the DPR for the STP in Ghazipur).

Needs Identified

Challenge: Land availability

- *Description*: Land availability is a major barrier to the implementation of FSSM due to the lack of space for both FSTPs and individual household septic tanks and latrines.
- *Need*: Congested areas in both Unnao and Ghazipur will require innovative solutions for the collection and transport of faecal sludge as well as innovative incentives/financial models to ensure tankers dump their waste at FSTPs, if they are in fact located outside the city. To better address these challenges, SCBP will need to engage more closely with masons/ installers as well as system service providers to understand from their point of view the barriers to implementing sanitation systems and system desludging, respectively.

Challenge: Capacity of ULBs

- *Description*: The ULBs lack the capacity to deal with the land challenge as it relates to faecal septage and sludge management.
- *Need*: Support from the DM will be central in order to progress in each city.

UNNAO

Visit Dates: 27-28 July, 2016

Visiting SCBP Representatives

Depinder Singh Kapur (NIUA)
Ankita Gupta (NIUA)
Lee Boudreau (CAWST)

City Officials Visited

District Magistrate: Ms. SaumyaAgarwal
Executive Officer: Mr. Umesh Kumar Mishra
Junior Engineer: Mr. P.K. Shrivastava

Sanitation Overview

Percent of HH with septic tanks: 50%
Other sanitation systems: Remaining toilets are directly connected to drains
Estimated septic tank desludging return: 10 years
Estimated desludging cost: INR 750 per trip (municipality) to INR 850 per trip (private agencies)
Current FS disposal: No treatment; dumping in drains outside of city
No. of public toilets: 6 (each with 6 toilets)
Status of SBM: 2380 applications received
*Land available for FSTP:*Yes

Typical septic tank design and management process

Typically, homes have double-chamber septic tanks with the approximate dimensions of 5x8x10 feet. Given their capacity, they are emptied on average once every 10 years, according to the EO. To have the system emptied, the home owner generally submits a written application to the municipality, requesting the desludging service. The municipality charges about INR 750 per trip, whereas, private companies charge approximately INR 850-900 per trip.

Discussion Notes

Discussion with District Magistrate (DM)

The primary role of the DM's office is to manage and supervise land issues in the 18 local bodies under the jurisdiction of Unnao. The DM has allotted land to the municipality for construction of an STP; however, to date, there is no sewer network or centralised treatment facility. The municipal boundary of Unnao is also expanding as per the information given by the DM. A new development authority has been established, Unnao Shuklaganj Development Authority, which looks after the land use of both the cities—Unnao and Shuklaganj. The boundary of its jurisdiction is not yet defined.

The DM has also ensured NIUA that the support required from the office to make the cities open defecation free would be provided.

Discussion with Executive Officer (EO) and city officials

The city is divided into 29 wards and 12 zones. Unnao Municipality has 335 staff,out of which, there is one sanitary inspector and 12 hawaldars who look after the management of collection and disposal of solid waste and drain cleaning.

Approximately 50% of the households in Unnao have septic tanks and the remaining number of existing household toilets are directly connected to drains. Typically, households with septic tanks have double-chamber tanks that are approximately 5 x 8 x 10 feet in size. The emptying of these systems has been reported to be once every 10 years. In order to receive the desludging service, home owners are required to submit a written application to the municipality. The municipality charges about INR 750 for their desludging services, while private companies in the city offer services between INR 850 and INR 900. There is no treatment currently available so tankers discharge their contents in drains or land outside the city.

In addition to household toilets, there are 6 public facilities with 6 toilets each. No further information on the status of these facilities was available.

Implementation under the Swachh Bharat Mission had not started by the time of the city assessment visit. However, individual households have submitted approximately 2380 applications to the municipality for support under the mission.

Unnao does not have a City Sanitation Plan (CSP) or City Development Plan (CDP) for its municipality. They have, however, started preparing a Detailed Project Report (DPR) for an STP. Uttar Pradesh Jal Nigam, a para-statal agency has been charged with developing the DPR and they have sent a draft to the National Mission for Clean Ganga (NMCG) for the review. The STP design will connect the major drain to a treatment facility. This facility will ideally treat the sewage flowing into the main drains. Funding for the STP would come from NMCG. A larger sewer network could then be built in the second phase with AMRUT funding. There also appears to be some interest and encouragement at the state level to consider septic tanks where they are absent and focus on septage management.

Needs Identified

Challenge: **Land availability**

- *Description*: Congestion in Unnao will affect the construction of new septic tanks and latrines as well as their access for desludging.
- *Need*: Congested areas in Unnao will require innovative design solutions for the implementation of septic tanks or latrines. Community based solutions may be considered where individual systems cannot be constructed. Innovative solutions such as small vacuum tankers or manual emptying for the collection and transport of faecal sludge will also have to be considered in order to access such congested areas. To better address these challenges, SCBP will need to engage more closely with masons/ installers as well as system service providers to understand from their point of view the barriers to implementing sanitation systems and system desludging, respectively.

Challenge: **Competing priority**

- *Description:* A DPR for an STP has already been developed and is currently the priority for Unnao. Since land is limited, the construction of the STP could possibly interfere with the construction of an FSTP because the land currently allocated for the STP was discussed as the land option of the FSTP.
- *Need:* A discussion on land allocation may be

needed if the cityis truly interested in FSSM. If they move forward with constructing the STP, a different plot of land would have to be identified.

Challenge: **Onsite sanitation system management**

- Description: Currently, the average desludging rate is estimated at once every ten years. This frequency seems relatively low and may impact the function of the system causing fecal sludge to leak into the environment once the system has filled.
- Need: New and different managing strategies will need to be considered to improve the function of the onsite sanitation systems. Aspects such as the application process for desludging service should be revisited and better understood in order to make revisions.

Opportunity: 2380 applications have been submitted for the construction of toilets and on-site sanitation systems under SBM. No money has been allocated and construction has not been started. This may be an opportunity to talk more closely with masons/installers as well as look at designs to make suggestions at the containment phase of the sanitation value chain. While containment is not directly part of FSSM, the designs of the sanitation structures directly impact emptying, transport and treatment.

GHAZIPUR

Visit Dates: 10-12 August, 2016

Visiting SCBP Representatives

Paramita Datta (NIUA)
Jyoti Dash (NIUA)
Laura Kohler (CAWST)

City Officials Visited

District Magistrate: Mr. Sanjay Kumar Khatri
Executive Officer: Mr. Jitendra Kumar Anand

Sanitation Overview

Percent of HH with septic tanks: ~60%
Other sanitation Systems: Unknown
Estimated septic tank desludging return: 3-4 years
Estimated desludging cost: INR 1000-2000
Current FS disposal: No treatment; dumping outside of city
No. of public toilets: Unknown
Status of SBM: Nothing started as of 12 August, 2016
Land available for FSTP: Unknown

Discussion Notes

Discussion with District Magistrate (DM)

An STP is being constructed in Ghazipur under NMCG. Currently, there is no sewer network constructed in the city and the majority of the population uses septic tanks or simple pit latrines. However, the city does not maintain a record for sanitation, so its status is relatively unknown. The DM seemed to be of the opinion that FSSM would be unnecessary in Ghazipur because of the construction of both the STP and sewer network. He pointed out that the city will eventually receive 100% coverage with sewers and centralised waste water treatment; therefore, the FSTP would become obsolete over time once the project is complete.

Discussion with Executive Officer (EO)

The EO that NIUA had been in communication with had been transferred and the EO available the day of the visit had assumed his role that same day. While he knew little of the city, the new EO seemed to be proactive and interested in FSSM. He had attended a training programme on City Sanitation Plans (CSP) conducted by Centre for Science and Environment (CSE) and was not new to the idea of FSSM. In his previous post, he had prepared a CSP with the support of GIZ.

There are no engineers, sanitary workers or health officers on the staff of the municipality, and the EO in charge of sanitation is a tax collector. Ghazipur has 8 tractors, 10 hydraulic tempos and 3 loaders for Solid Waste Management (SWM) and one suction machine for cleaning of septic tanks.

The EO also was aware of the STP being constructed under the NMCG. The DPR for the project was prepared by the Uttar Pradesh Jal Nigam and funded by Japan International Cooperation Agency(JICA). The DPR has been submitted for approval, and the funding is expected to be released by the end of 2016. 60% of the population is, however, served by septic tanks that in reality are basic pit latrines with a soakage pit (sokta). The systems in Ghazipur seem similar to those seen in Hajipur. The EO reported that the latrines are typically emptied every 3 to 4 years as they fill up. The cost for emptying is estimated to be between INR 1000 and INR 2000. To date, no work has been sanctioned under SBM.

Needs Identified

Challenge: **Land availability**

- *Description:* Land availability is unknown.
- *Need:* SCBP needs to explore land options for an FSTP as well as investigate access issues that may impact desludging, transport and the construction of new on-site sanitation systems.

Challenge: **Competing priority/FSSM acceptance**

- *Description:* The DM seemed convinced that FSSM would become obsolete once the STP and sewer network were constructed.
- *Need:* More information is needed to illustrate how FSTPs and STPs can complement each other and how typically several strategies are employed at a city level to achieve complete sanitation coverage. Additionally, more

information on the financial incentives of FSSM may be useful in convincing the DM on the value addition of FSSM.

Challenge: **No trained personnel**

- *Description*: Ghazipur has no engineer or sanitary advisor on the staff.
- Need: The capacity of the city staff will need to be better understood before moving forward with the implementation of FSSM. If the capacity is low, SCBP may need to develop activities to build their capacity or innovate solutions that work in spite of those limitations.

Challenge: **Limited capacity /Lack of knowledge management (related to city sanitation)**

- *Description*: As a result of the capacity of staff and frequent staff turnover, little information about the city sanitation situation is available;for example, on the quantity and quality of sanitation systems.
- Need: Knowledge management capacity building activities may be useful at the city level.

Annexure 3: Andhra Pradesh

HYDERABAD

Visit Dates: 26 & 28 July, 2016

Visiting SCBP Representatives

ParamitaDey (NIUA)
Tommy Ngai (CAWST)
Laura Kohler (CAWST)

State Officials Visited

Managing Director of Swachh Andhra Corporation: Mr. Muralidhar Reddy
Environmental Engineer of Swachha Andhra Corporation: Mr. Soma Bharath
APUFIDC Chief Engineer: Mr. G. Kondal Rao

Discussion Notes

There was some miscommunication when SCBP arranged the first trip to visit the state level officials. Due to the recent division of the state, Andhra Pradesh is in the process of moving their state offices from Hyderabad to Vijayawada, the new state capital. As a result, the officials typically split their time between the two state offices. We arrived in Hyderabad on 26 July to meet the officials during a period where they were required to sit in their Vijayawada office; therefore, SCBP was unable to visit a few of the officials during the first visit. SCBP did meet, however, with the several staff of Andhra Pradesh Urban Finance and Infrastructure Development Corporation (APUFIDC).

On 28 July, SCBP representatives returned to Hyderabad to meet with the Managing Director of Swachha Andhra Corporation. The MD appeared to be proactive and interested in the opportunity to implement FSSM in the various cities of Andhra Pradesh.

PRODATTUR

Visit Dates: 1-3 August, 2016

Visiting SCBP Representatives

Depinder Singh Kapur (NIUA)
Ankita Gupta (NIUA)
Tommy Ngai (CAWST)
Laura Kohler (CAWST)

City Officials Visited

Commissioner: Mr. G. Venketarao
Chairperson: V. Gurivireddy
Deputy Executive Engineer:
Mr. S. Rama Chandra Prabhu
Muncipal Engineer: Mr. Surendra Babu

Sanitation Overview

Percent of HH with septic tanks: 39.5%
Other sanitation systems: 13% (pit latrines)
Estimated septic tank desludging return: 3-5 years
Estimated desludging cost: INR 2000-2500 per trip (private operators)
Current FS disposal: No treatment; dumping on open land and water bodies
No. of public toilets: 10 community facilities & 9 public facilities
Status of SBM: 979 individual household toilets (IHHT) built, 158 IHHT in progress, and 181 IHHT expected to be built
Land available for FSTP: unknown

Typical septic tank design and management process

The city is divided into 40 municipal wards. There are a total of 38,000 households in Proddatur, of which 165,000 are located in temporary settlements and 50,000 are in poorer settlements. Approximately, 15,000 households use septic tanks and 5,000 households have pit latrines in Proddatur. The city also has 10 community toilets in the temporary/ poor settlements and 9 public toilets in markets and public areas. These facilities are maintained by Sulabh International. The municipality pays Sulabh International to maintain the community toilets

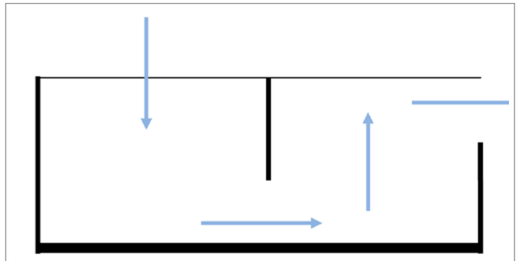


Figure 7: Septic tank configuration observed in Prodattur.

which are being built in the temporary settlements in the city. Sulabh also charges a user fee to maintain the public toilets.

Three types of on-site sanitation installations serve the majority of households in Proddatur—septic tanks, lined and unlined pits.

The septic tanks typically consist of two chambers with a downward baffle. The dimensions of the tank appeared to be approximately 4 x 2 x 4 feet and, in one case, both the inlet and outlet were observed in the same compartment, rendering the second compartment useless. The construction cost of each septic tank is between INR 25,000 and INR 30,000 depending upon its size. Swachh Andhra Corporation pays INR 15,000 to supplement the construction cost. Due to their cost and the space availability on the property, households often opt for a smaller septic tank. These small septic tanks fill up frequently and the cost and/or cleaning responsibility falls on the home owner. This design perhaps saves the household money by reducing the high upfront cost, but increases the cost for O&M. Figure 7 above illustrates the configuration of the two chamber septic tanks.

The pits were constructed using prefabricated concrete rings (lined) or broken stone slabs (unlined). Pits with prefabricated concrete rings and no floor lining cost about INR 6,000 per facility, not covering the superstructure.

In terms of FSSM, the municipality does not own vacuum trucks to empty the septic tanks and latrines. There are approximately 8 to 10 trucks owned by private operators that offer emptying services; they charge approximately INR 2000 to 2500 per trip. These emptiers then dispose of the sludge in the river/open spaces outside the city limits.

Discussion Notes

Meeting with the Commissioner and Chairperson

The city has a DPR prepared for a storm water drainage network and a proposal for a 1MLD STP. They have allotted 0.3 acres for constructing the STP to treat the water from the storm water drains. The proposal for the plant had a budget of INR 141 Crore.

For the construction of new toilets, the municipality is using funds allocated under the Swachh Bharat Mission. Swachh Andhra Corporation is issuing INR 15,000 to individual households to build toilets/ septic tanks through the municipality.

We were informed that the municipality is rich but is politically divided.

Discussion with Municipal Engineer

The city has 14 MLD water treatment facilities. There is also an existing irrigation canal, Madhur Canal, that serves as a storm water and waste water drain despite its intended design. The drain system, including the canal, were designed to handle 25 mm/hr rainfall. During large rain events, the drains overflow. This is a problem largely due to their dual use. The municipality would like to construct a 1 MLD treatment facility to treat the waste water flowing through that main channel. However, a 1 MLD plant would be inadequate given that the channel carries an estimated 10 MLD of waste water. Currently, the waste water from the irrigation canal flows onto open lands outside the city, which has environmental and health implications for the city.

The SCBP representatives introduced FSSM, which would involve the construction of an FSTP as another potential sanitation solution. There was some concern related to the cost and scale of an FSSM project. SCBP clarified that putting into operation an FSTP could be accomplished in a decentralised manner in order to learn while implementing. The municipal engineer suggested that the land allotted

for the 1 MLD STP could be used for FSTP if required, especially because the land would be insufficient for the STP.

Observation and extended community visit

Three different areas were visited to observe the construction of on-site sanitation technologies. The first was Sanjiv Nagar, Ward 9, located near the irrigation/drainage channel. Sanjiv Nagar is a poorer settlement where primarily pit latrines are being constructed using stone slabs. Both the walls and the unlined floor of the pits were pervious. In a second community, there were latrines installed with prefabricated concrete rings, and in Nadempalli, Ward 17, double-chamber septic tanks were being constructed. The two-chambered septic tanks had outlets directing effluent to the open drain system and the baffles separating the two compartments were installed to direct flow through the bottom of the tank. This configuration is not correct if the purpose of the septic tank is to settle and contain solids. All systems during the SCBP visit were being constructed with funding from SBM and to our knowledge did not follow design standards.

Needs Identified

Challenge: **Competing priority**

- *Description:* The 1 MLD sullage plant is currently the priority for Prodattur. A DPR has been developed for the drainage system and in that design the sullage plant is to be located near the canal in Ward 9. There was a mention of that same land being re-allocated for an FSTP, pending the progress of the FSSM plan. The use of that land for the 1 MLD sullage plant would interfere with the construction of an FSTP because generally land is limited in the city.
- *Need:* A discussion on land allocation may be needed if the city is genuinely interested in FSSM. If they move forward with using that land for the STP, a different plot of land would have to be identified.

Challenge: **On-site sanitation system management**

- *Description:* There is high variability in the quality of on-site sanitation installations being implemented in Prodattur. Generally, the septic tanks are undersized and the baffles located incorrectly within the tank. The current configuration forces the effluent to flow along the bottom of the tank, typically where solids settle. Given this configuration, solids are disturbed with every use, interrupting the primary purpose of the tank. Instead, a mix of the solid and liquid fraction is able to leave the tank, which can cause clogging in the outlet and the receiving drain. In terms of the pit systems, many were unlined, which can have a direct public health impact on the homeowner's water supply.
- *Need:* More information is necessary to better understand the limitations. Workshops/trainings to offer information about correct installation options could be provided for installers or masons. Local regulations that could control the quality of installations and their enforcement should also be better understood, because technical knowledge may not be the only issue. There may generally be a lack of incentives for proper construction and system operation.

GUDUR

Visit Dates: 6-8 August, 2016

Visiting SCBP Representatives

Paramita Dey (NIUA)
Jyoti Dash (NIUA)
Tommy Ngai (CAWST)
Laura Kohler (CAWST)

City Officials Visited

City Commissioner: Mr. L. Chandra Shekhar Reddy
Deputy Executive Engineer: Mr. B.V.NagasearRao
Mayor: Smt. PonakaDevasana
Trust Chair: Mr. P.Sivkumar Reddy

Sanitation Overview

Percent of HH with septic tanks: Unknown
Other sanitation systems: Unknown
Estimated septic tank desludging return: Unknown
Estimated desludging cost: Unknown
Current FS disposal: Open dumping
No. of public toilets: Unknown
Status of SBM: Constructing double-chamber septic tanks in partnership with local trust
Land available for FSTP: Yes, but no interest in FSSM

Typical septic tank design and management process

Two-pit septic tanks are currently under construction in Gudur using a combination of SBM and local trust funding. The first tank in the configuration has a sealed bottom to prevent infiltration into the groundwater and to contain solids. The second tank is a soak pit with an unlined bottom. As the first tank fills with solids, it must be desludgedto prevent the second pit from clogging due to overflow of solids. It was unclear what other designs were being used in Gudur, though we suspect it is a combination of pits and septic tanks. Private service providers are available within the city to desludge the existing systems, but currently there is no place for dumping or treatment.

Discussion Notes

Discussion with Commissioner and Deputy Executive Engineer

The Commissioner whom we had contacted had been transferred and the new Commissioner had joined the municipality within a couple weeks of our visit.

The state gave permission to the municipality to partner with a local NGO to construct on-site sanitation installations in Gudur under SBM. The construction of a properly designed septic tank was estimated at INR 23,000. The state with SBM funding provides up to INR 15,000 and the trust covers the difference to ensure quality and construct aesthetically appealing systems. With the support of the trust, it was estimated that Gudur would achieve 95% of its household sanitation coverage target in the three months following our visit. This may be an overestimate.

The municipality has been proactive in other areas such as solid waste management, drain cleaning, chlorination, and mosquito extermination. It is currently collecting data to map city-wide coverage of these areas using GIS, but the survey does not include sanitation.

Despite the progress being made with state SBM and trust funds, the Commissioner did not see the added value of FSSM to achieving a clean city. It was his opinion that FSSM, specifically the treatment process, would fail because of public perception. Furthermore, he was concerned that the people would not approve of constructing an FSTP within the city limits. While he acknowledged the prevalence of septic tanks in use in the city, he believed that the system would ultimately fail because the operator positions would be impossible to fill and the end product would be unmarketable.

Discussion with Mayor and her Husband

Both the Mayor and her husband were more open to the idea of FSSM. Though they had initial reservations, the business opportunities illustrated by the various financial models caught their attention. They acknowledged the fact that there exist many congested areas in the city where placing sewers could be a problem. They expressed the view that FSSM could be a more viable option for those areas.

Needs Identified

Challenge: Motivation

- *Description:* The city Commissioner was clearly not interested in FSSM and expressed concern that it would not be well received by the public.
- *Need:* Behaviour change activities and buy-in are required before progressing with the planning and implementation of FSSM.

Annexure 4: Needs Assessment Outline

This document outlines the overall needs assessment process for data collection and analysis. State and Commissioner visits should be conducted first for approvals, protocol, and broad-level landscaping. These should be followed by various individual and focus group meetings at the ULB level, then with any other sanitation players at the city level, such as emptiers or masons.

Process Overview

Four days have been typically allocated to provide adequate time for the activities below while retaining flexibility for the availability of city officials, staff, and other sanitation stakeholders.

Day 1: Arrive in the city and meet the city Commissioner and/or city officials. Interview the Commissioner or officials depending on their availability to understand where authority and responsibility lie for sanitation, their perceptions of decentralised sanitation, and where the city may require support to implement sanitation projects.

Day 2: Hold a broad orientation session with as many staff as possible from the ULB. During this time the goals and structure of the SCBP will be outlined for participants; the partners will be presented in brief; general levels of readiness to implement decentralised sanitation can be assessed; and individual needs assessment tools can be distributed to all participants. These quick individual questionnaires will allow insight into the current challenges and weaknesses across the ULB in different departments and functions.

Day 3: Meet health and/or engineering departments at the ULB to conduct specific needs assessments of their ability to implement decentralised sanitation. Meetings with the departments will take the form of focus groups, and questions will assess their current strengths, challenges, areas to improve related to decentralised sanitation, and which capacity building services would be most appropriate to those needs.

Day 4: Conduct site visits and interview any masons or emptiers who can be met. In the event that it is not possible to meet these stakeholders, this time can be re-allocated to other project priorities such as modifying data collection tools or analysis of existing data.

Document Overview

1. State Level Visit Document

To be used during interviews with state level officials prior to city visits. Both a simplified and more detailed version can be used for ease of interviewing and data recording. It can also be used for state and city sanitation landscape analysis prior to city visits.

2.Commissioner or City Official Visit Document

To be used during interviews with city Commissioners or other city-level officials. Both a simplified and more detailed version can be used for ease of interviewing and data recording.

3.ULB Staff Assessment Document

To be used during large orientation sessions or with focus groups with as many city-level staff across different departments as possible. Used to gain a

broad-level analysis of needs and weaknesses at the ULB level.

4.Health Department Document
To be used during focus group meetings with the ULB's health department to gain insight into health department functions, needs, and role in implementing decentralised sanitation.

5.Engineering Department Document
To be used during focus group meetings with the ULB's engineering department to gain insight into engineering department functions, needs, and role in implementing decentralised sanitation.

6.Emptiers Assessment Document
To be used during individual or small group meetings with emptiers present at the city level to gain insight **into the role and needs of emptiers at the city level.**

7.Masons Assessment Document
To be used during individual or small group meetings with masons present at the city levelto gain insight into the role and needs of emptiers at the city level.

Capacity Needs Assessment: Addressing Urban Faecal Sludge and Septage Management

Annexure 5:
Questionnaires for State and City Visits

QUESTIONNAIRE FOR STATE OFFICIALS

This stage of analysis involves collection of data at the state level with appropriate officials. Information should be gathered based on discussions with state-level officials who are available and in charge of sanitation or urban development. These conversations should be followed by formal needs assessments at the city and ULB level.

NIUA Representatives		**State Representatives**	
Name	Position	Name	Position

Sanitation Landscaping

Number	**Question**
1	What is your vision for the state under Swachh Bharat Mission/AMRUT/Smart Cities?
Notes:	
2	What is your current status on achieving the goals of SBM?
Notes:	
3	What is your vision for achieving ODF in the state and cities? How are you planning to achieve this?
Notes:	

4	Do you have a state level sanitation strategy? Can you talk about it?
Notes:	
5	To what degree does the state influence city sanitation strategy or plans?
Notes:	
6	We are going to work in these two cities – Who decides what type of sanitation infrastructure will be built in the cities? Who funds it and what is the process for applying for funding? Draw comparisons with the existing sewer network.
Notes:	
7	Of these two cities, what are your thoughts around the challenges they are facing?
Notes:	
8	Based on the platform we have presented to help cities implement on-site sanitation and faecal sludge management, is there anything you would like from the platform to help you?
Notes:	
9	How would you like the platform to communicate with you at the state level?
Notes:	
10	Who are the nodal officers we should be in touch with to work together?
Notes:	

Detailed Project Reporting and Transactional Advisory Support

Number	Question
1	What is your current process for preparing DPRs?
Notes:	
2	When you have a project, what is the process you normally go through?
Notes:	
3	Do you do it with consultants or independently? Where are the consultants located?
Notes:	

Operation and Maintenance of FSSM and Regulatory Changes

Number	Question
1	Who looks after on-site sanitation and faecal sludge management – the ULB or para-statals? Do you think the ULB would like to do this or outsource the work?
Notes:	

Additional Questions

1. How do you feel about the acceptance of FSSM systems amongst the cities and users in your state? Will they accept it or will they only want networked systems?
2. What types of capacity building services have been conducted in the past?
3. Do you have any capacity building programmes for FSSM?
4. What is your general feeling about capacity building and how it should be done?

Other Information Gathered

CHECK LIST FOR DATA COLLECTION AT STATE LEVEL

This stage of analysis involves collection of data at the state level with appropriate officials. Information should be gathered based on discussions with state-level officials who are available and in charge of sanitation or urban development. These conversations should be followed by formal needs assessments at the city and ULB level.

NIUA Representatives		State Representatives	
Name	Position	Name	Position

Sanitation Landscaping

Number	Question
1	What is your vision for the state under Swachh Bharat Mission/AMRUT/Smart Cities?
2	What is your current status on achieving the goals of SBM?
3	What is your vision for achieving ODF in the state and cities? How are you planning to achieve this?
4	Do you have a state level sanitation strategy? Can you talk about it?
5	To what degree does the state influence city sanitation strategy or plans?
6	We are going to work in these two cities – Who decides what type of sanitation infrastructure will be built in the cities? Who funds it and what is the process like for applying for funding? *Draw comparisons with the existing sewer network.*
7	Of these two cities, what are your thoughts around the challenges they are facing?
8	Based on the platform we have presented to help cities implement on-site sanitation and faecal sludge management, is there anything you would like from the platform to help you?
9	How would you like the platform to communicate with you at the state level?
10	Who are the nodal officers we should be in touch with to work together?

Detailed Project Reporting and Transactional Advisory Support

Number	Question
1	Who looks after on-site sanitation and faecal sludge management – the ULB or para-statals? Do you think the ULB would like to do this or outsource the work?

Operation and Maintenance of FSSM and Regulatory Changes

Number	Question
1	What is your current process for preparing DPRs?
2	When you have a project, what is the process you normally go through?
3	Do you go through it with consultants or independently? Where are the consultants located?

Notes:

QUESTIONNAIRE FOR COMMISSIONER/ EXECUTIVE OFFICERS

This stage of analysis involves collection of data at the city level with appropriate officials. Information should be gathered based on discussions with city-level officials who are available and in charge of sanitation or urban development. These conversations should be followed by formal needs assessments with ULB departments and staff.

NIUA Representatives		State Representatives	
Name	Position	Name	Position

Sanitation Landscaping

Number	Question
1	What is your vision for the city under Swachh Bharat Mission/AMRUT/Smart Cities?
Notes:	
2	What is your current status on achieving the goals of SBM? What have been your successes and your challenges related to sanitation?
Notes:	
3	What is your vision for achieving an ODF city? How are you planning to achieve this?
Notes:	

4	Do you have a city-level sanitation plan? What is the strategy for it?
Notes:	
5	What can you tell us about meeting people involved in FSSM activities in the city? Who empties the septic tanks and how can we meet them?
Notes:	
6	Where does the faecal sludge go after being collected and how is it treated or used?
Notes:	
7	Where does the effluent go and what happens to it afterwards?
Notes:	
8	Do you have a list of private contractors who are involved in septage management and faecal sludge management, or are you not involved in these processes?
Notes:	
9	What is your attitude toward public-private partnerships?
Notes:	

Detailed Project Reporting and Transactional Advisory Support

1	What is your current process for preparing DPRs?
Notes:	

2	When you have a project, what is the process you normally go through?
Notes:	
3	Do you do it with consultants or independently?
Notes:	

Operation and Maintenance of FSSM and Regulatory Changes

1	Who looks after on-site sanitation and faecal sludge management – the ULB or para-statals? Do you think the ULB would like to do this or outsource the work?
Notes:	
2	What is your feeling about the acceptance of faecal sludge management among the users in your state?
Notes:	

Additional Questions

1. How do you feel about the acceptance of FSSM systems amongst the users in your city? Will they accept it or will they only want networked systems?
2. What types of capacity building services have been conducted in the past?
3. Do you have any capacity building programmes for FSSM?
4. What is your general feeling about capacity building and how it should be done?

Other Information Gathered

CHECK LIST FOR DATA COLLECTION AT CITY LEVEL

This stage of analysis involves collection of data at the city level with appropriate officials. Information should be gathered based on discussions with city-level officials who are available and in charge of sanitation or urban development. These conversations should be followed by formal needs assessments with ULB departments and staff.

NIUA Representatives		State Representatives	
Name	Position	Name	Position

Sanitation Landscaping

Number	Question
1	What is your vision for the city under Swachh Bharat Mission/AMRUT/Smart Cities?
2	What is your current status on achieving the goals of SBM? What have been your successes and your challenges related to sanitation?
3	What is your vision for achieving an ODF city? How are you planning to achieve this?
4	Do you have a city-level sanitation plan? What is the strategy for it?
5	What can you tell us about meeting people involved in FSSM activities in the city? Who empties the sceptic tanks and how can we meet them?
6	Where does the faecal sludge go after being collected and how is it treated or used?
7	Where does the effluent go and what happens to it afterwards?
8	Do you have a list of private contractors who are involved in septage management and faecal sludge management, or are you not involved in these processes?
9	What is your attitude toward public-private partnerships?

Detailed Project Reporting and Transactional Advisory Support

Number	Question
1	What is your current process for preparing DPRs?
2	When you have a project, what is the process you normally go through?
3	Do you do it with consultants or independently?

Operation and Maintenance of FSSM and Regulatory Changes

Number	Question
1	Who looks after on-site sanitation and faecal sludge management – the ULB or para-statals? Do you think the ULB would like to do this or outsource the work?
2	What is your feeling about the acceptance of faecal sludge management among the users in your state?

Notes:

Capacity Needs Assessment: Addressing Urban Faecal Sludge and Septage Management

QUESTIONNAIRE FOR INDIVIDUAL STAFF

This stage of analysis involves individual collection of data from staff and officers in the ULB. Information should be gathered from a range of individuals. This should be done in addition to discussions at the department level to highlight specific perceived challenges and needs for capacity building.

Gender

Male		Female	

Job title

Time in current position

Less than 2 years	
2-5 years	
5-10 years	
More than 10 years	

Capacity building and training experience

*Have you attended training programmes, conferences, or seminars?

Yes		No	

Relevancy

*Generally, how relevant or useful have trainings been to your job function?

Very relevant	
Somewhat relevant	
Not at all relevant	

Action

*Were you able to put into practice things you learned in training programmes? If no, why not?

Yes		No	
		Superiors did not agree	
		No access to resources	
		Other	

Preferred Language

*Please specify which language you prefer service delivery. Specify language if regional.

Number	Language	Select your language preference
1	English	
2	Hindi	
3	Regional language	

Preferred Areas of Training

*Please select subject areas you think would help you improve in your work.

Number	Subject Area	
1	Solid waste management	
2	Sewerage design, construction, and management	
3	Decentralised sanitation and on-site sanitation systems	
4	Office management	
5	Legislation and regulations	
6	Basic computer skills	
7	Finance management	
8	Procurement management	
9	Accounting	
10	Project management	
11	Quality assurance	
12	Monitoring and evaluation	
13	Human resource management	
14	Proposal and project preparation	
15	Documentation and reporting	
16	Public health	
17	Contract management	
18	Outsourcing strategies and processes	
19	Community mobilisationand empowerment	
20	Other	

*If “Other”, please describe topics which would be beneficial to your job performance.

Capacity Needs Assessment: Addressing Urban Faecal Sludge and Septage Management

Preferred Methodologies

*What type of activities and training styles do you prefer for capacity building?

Number	Training Area	Check the options you prefer. You may choose multiple options.
1	Exposure or site visits	
2	Group work and exercises	
3	Films and audio-visual	
4	Speeches and oral presentations	
5	Classroom lectures	
6	Coaching and mentoring sessions	
7	Other	

Suggestions for improved capacity

*Please describe any other suggestions you have for improving the capacity of urban local bodies and their staff.

Other information

*Please list any other information you feel would be valuable for us to know that we may have missed.

QUESTIONNAIRE FOR ENGINEERING DEPARTMENT

This stage of analysis involves collection of data from the engineering department of the ULB through a focus group. Information should be gathered based on discussions with the head of the engineering department and other available members of the department. The focus group session will be divided into four topics:

1. Engineering department
2. Centralised sanitation systems
3. Decentralised sanitation systems
4. Capacity building activities

NIUA Representatives

Name	Position

Focus Group Participants

Name	Gender/Sex	Job title	Duration in role

ENGINEERING DEPARTMENT

Structure and responsibilities

*What is the structure of the engineering department? If helpful, make a diagram based on conversations.

Staffing Pattern

*How many positions are filled, vacant, or temporary?

Number	Type of Post	Total
1	Sanctioned / In-position	
2	Vacant	
3	Temporary / Contract Basis	

Finances

*How does the department access funds? How do you allocate them for projects?

Department focus of work

*In the past year, in which sectors did the department spend the majority of its time? What would be the department's desired distribution of time? Describe the department's activities in the listed key sectors.

Sectors	% of time spent in the last year	Desired % of time spent	Description
Transportation			
Sanitation (waste water and faecal sludge)			
Solid Waste Management			
Water			
Energy			
Other			

*If sanitation is not a current priority, describe why below

CENTRALIZED SANITATION SYSTEMS

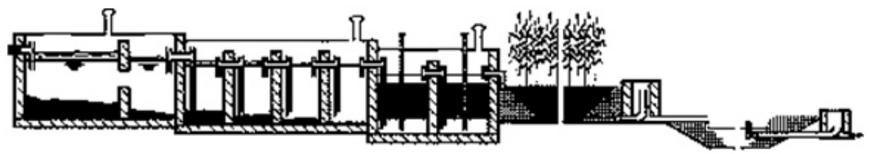
*What are the department's experiences and challenges in centralised sanitation?

	Tasks	Description of process	Challenges
Planning	City Sanitation Plans		
	Funding		
	Legal and regulatory framework		
	Land acquisition (space availability, ownership, etc.)		
	Physical constraints (geography, topography, population density, etc.)		
Design	Design (sewers and treatment sites)		
	Detail project reports (DPR)		
Construction	Construction		
	Procurement (contracting process)		
Operations	Operation and maintenance		
	Monitoring and evaluation of operation		
	Enduse of sludge		

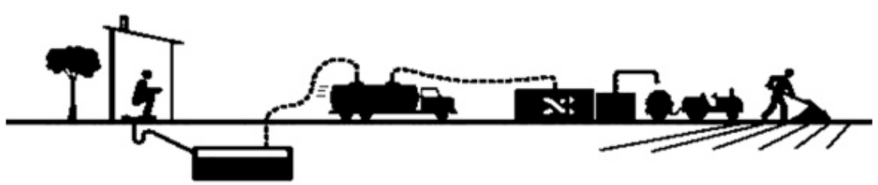
DECENTRALIZED SANITATION SYSTEMS

*If required, explain that the term decentralisedsanitation includes both faecal sludge management as well as DEWATs. These are two options to manage on-site sanitation. Provide a diagram to illustrate these two options if necessary for understanding.

Decentralized Wastewater System



FSSM



Is decentralised sanitation included in your City Sanitation Plan? If not, why not?

To what degree will the public accept decentralised sanitation?

How many decentralised sanitation projects have you been involved with?

** Ask detailed questions on the existing infrastructure, the equipment and the staff responsible for tasks. If the municipality has done limited work on decentralised sanitation, ask further questions about solid waste management. There are similarities between solid waste management and faecal sludge management (e.g. collection, treatment, and disposal).*

Components	Achievements	Challenges
Septic Tanks / Pits		
FSSM	Emptying/Transport	
	Treatment	
	Use/Disposal	
DEWATs		

Financial arrangement

What is the municipal budget for sanitation?

Where does the budget come from (e.g, taxes, grants, etc.)?

Who manages the sanitation budget?

Legal and regulatory framework

What laws and regulations exist for on-site sanitation, FSSM and DEWATs?

How are laws and regulations enforced?

If there are no regulations, what solutions exist?

CAPACITY BUILDING

Have you received any training and support on sanitation?

If yes, what were the topics?

How appropriate or useful was it? Why or why not?

How does the department select capacity building activities?

What areas would benefit from strengthening in your department?

Training Area	Yes/No (+ Comments)
Awareness on decentralised sanitation	
Developing city sanitation plans	
Selection and design of technologies for emptying, transportation and treatment of faecal sludge	
Contracting and tendering	
Selecting and monitoring consultants	
Construction supervision	
Operation and maintenance of a treatment site	
Project Management	
Preparation of detailed project reports (DPR)	
Funding management	
Other	

What type of capacity building is preferred for your department? Why?

Training Area	Comments
Presentations and lectures	
Handholding	
Training workshops	
Exposure or site visits	
Peer-to-peer learning	
E-learning	
Mobile-learning	
Other (Please describe)	

QUESTIONNAIRE FOR HEALTH DEPARTMENT

This stage of analysis involves collection of data from the health department of the ULB through a focus group. Information should be gathered based on discussions with the head of the health department and other available members of the department. The focus group session will be divided into three topics:

1. Health department
2. Decentralised sanitation systems
3. Capacity building activities

NIUA Representatives

Name	Position

Focus Group Participants

Name	Gender/Sex	Job title	Duration in role

1. HEALTH DEPARTMENT

1.1 Structure and responsibilities

*What is the structure of the health department? If helpful, make a diagram based on conversations.

- How many people work in the health department?
  - How many permanent staff?
  - How many contract staff?
  - How many vacancies?

1.2 Staffing Pattern

Number	Type of Post	Total
1	Sanctioned / In-position	
2	Vacant	
3	Temporary / Contract Basis	

*How many positions are filled, vacant, or temporary?

1.3 Finances

*How does the department access funds? How do you allocate them for projects?

1.4 Department focus of work

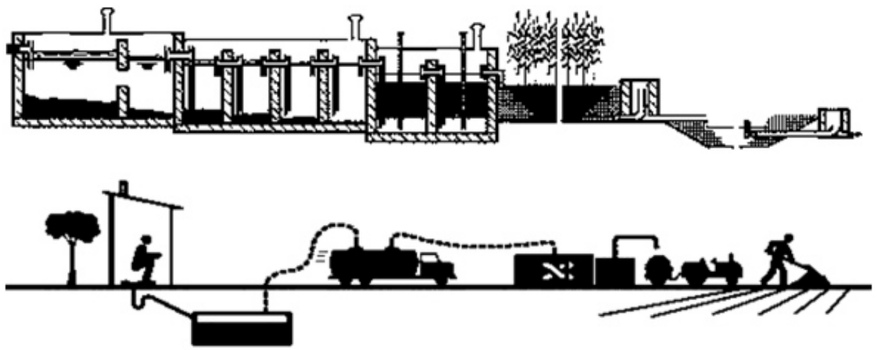
*In the past year, in which sectors does the department spend the majority of its time? What would be the department's desired distribution of time? Describe the department's activities in the key sectors.

Sectors	% of time in the last year	Desired % of time spent	Description
Births and deaths			
Marriage certificates			
Family planning			
Food safety			
Animal control			
Solid waste management			
Disease prevention			
Hospital			
Water			
Drainage			
Sweeping			
Public toilets			
Household toilets			
Street lighting			
Other			

*If sanitation-related tasks are not a current priority, describe why below.

2. DECENTRALISED SANITATION SYSTEM

Explain how the word decentralisedsanitation includes both faecal sludge management as well as DEWATs. These are two options to manage on-site sanitation. Provide a diagram of the two options to ensure the interviewees understand what we mean by decentralised sanitation.



Is decentralised sanitation included in your City Sanitation Plan? If not, why not?

To what degree will the public accept decentralised sanitation?

How many decentralised sanitation projects have you been involved with?

This includes on-site sanitation, faecal sludge management and DEWATs. Ask detailed questions on the existing infrastructure, the equipment and the staff responsible for tasks. If the municipality has done limited work on decentralised sanitation, ask further questions about solid waste management. There are similarities between solid waste management and faecal sludge management (e.g. collection, treatment, and disposal).

Components		Achievements	Challenges
Septic tanks (incl. number of inspections)			
Pit latrines (incl. no of inspections)			
Licensing masons (incl. no of masons)			
Enforcing standards			
Drainage			
FSSM	Emptying and transport		
	Treatment		
	Use/disposal		
DEWATs			
Community awareness			

2.1 Financial arrangement

What is the municipal budget for sanitation?

Where does the budget come from (e.g. taxes, grants, etc.)?

Who manages the sanitation budget?

2.2 Legal and regulatory framework

What laws and regulations exist for on-site sanitation, FSSM and DEWATs?

How are laws and regulations enforced?

If there are no regulations, what solutions exist?

3. CAPACITY BUILDING

Have you received any training and support on sanitation?

If yes, what were the topics?

How appropriate or useful was it? Why or why not?

How does the department select capacity building activities?

What areas would benefit from strengthening in your department?

Training Area	(Yes/No + Comments)
Awareness on decentralised sanitation	
Developing awareness campaigns	
Awareness on the link between health and sanitation	
Contracting and tendering	
Selecting and monitoring consultants	
Inspection of septic tanks and pit latrines	
Data management	
Community engagement	
Other	

What type of capacity building is preferred by your department? Why?

Training Area	Comments
Presentations and lectures	
Handholding	
Training workshops	
Exposure or site visits	
Peer-to-peer learning	
E-learning	
Mobile-learning	
Other (please describe)	

QUESTIONNAIRE FOR SLUDGE EMPTIERS

This stage of analysis involves collection of data from emptiers. Information should be gathered based on discussions with emptiers or staff of organisations responsible for FSSM emptying.

People Interviewed

*Please complete as many fields as possible

Name	Job title	Duration in role

Company Profile

*Describebriefly the emptying company or organisation.

Organisationname and details	Organisation location

Staffing

How many staff work in your organisation?

Number of staff

Clients

*How many clients does your organisation assist with regular emptying services?

Number of clients

Revenue

*How do you fund your operations?

Number	Sources of funding	
1	User fees/Tariffs	
2	Contracts	
3	Subsidies	
4	Other	

*If "Other," please describe the structure below.

Legal framework

*Please select the most appropriate response.

Is your organisation licensed?	
Yes	
No	

*Please describe why.

How well do you know laws and regulations related to the emptying and transport of faecal sludge?

Very well	
Somewhat	
Not at all	

Who enforces the laws and regulations?

Do penalties exist? If so, describe them.

Access to equipment

What equipment do you use for emptying and transportation services? How much equipment do you have? Who owns the equipment?

What personal protective equipment do you wear?

Number	Personal Protective Equipment	Yes/No
1	Breathing masks	
2	Gloves	
3	Protective suit	
4	Hand-washing equipment	
5	Other	

What type of on-site sanitation technologies do you empty (septic tanks, pits, etc.)?

Equipment Challenges

Describe the most common challenges you face with your current equipment.

Services

How do you market your services?

How do customers contact you when they need their on-site sanitation emptied?

How do you keep track of your customers?

Where do you discharge the faecal sludge?

Capacity Building

*Please select the most appropriate response.

Have you received any training?	
Yes	
No	

*If yes, please describe the training.

In what capacity would you be interested in receiving training?

Number	Training	Yes/No
1	Equipment use	
2	Health and safety	
3	Business	
4	Other	

If "Other," please describe the training below.

QUESTIONNAIRE FOR MASONS

This stage of analysis involves collection of data from masons. Information should be gathered based on discussions with the head of the health department and other members of the department.

People Interviewed

*Please complete as many fields as possible

Name	Job title	Duration in role

Company Profile

*Briefly describe your mason company or organisation.

Organisation name and details	Organisation location

Staffing

*How many staff work in your organisation?

Number of staff

Clients

*How many clients have you built on-site sanitation technologies for?

Number of clients

*Who are your clients?

Number	Clients	Yes/No
1	Households	
2	Institutions	
3	Communities	

Revenue

*Describe how you fund your operations.

Number	Sources of funding	
1	User fees/Tariffs	
2	Contracts	
3	Subsidies	
4	Other	

*If "Other," please describe the structure below.

Legal Framework

*Select the most appropriate response.

Is your organisation licensed?	
Yes	
No	

*Describe why.

How well do you know laws and regulations related to building septic tanks and pits?

Very well	
Somewhat	
Not at all	

Who enforces the laws and regulations?

Do penalties exist? If so, describe them.

Construction

What type of on-site sanitation technologies do you construct (septic tanks, pits, superstructure, etc.)?

Number	On-site sanitation technologies	Yes/No
1	Septic tanks	
2	Ventilated pit latrine	
3	Composting latrines	
4	Superstructure	
5	Other	

*If "Other," describe the technology below.

How many on-site sanitation technologies do you build on average (per week or per year)?

What are your main challenges in terms of construction?

Capacity Building

*Please select the most appropriate response.

Have you received any training?	
Yes	
No	

*If “Yes”, describe the training.

Would you be interested in receiving training?

Number	Training	Yes/No
1	Construction	
2	Health and safety	
3	Business	
4	Other	

If “Other,” please describe the training below.

DATA CHECK LIST FOR ORIENTATION MEETINGS

This stage of analysis involves collection of data at the city level with appropriate officials. Information should be gathered based on discussions with city-level officials during the presentation of the SCBP and FSSM presentation. This should be followed up by additional meetings with individuals and departments.

NIUA Representatives		City Representatives	
Name	Position	Name	Position

Sanitation Landscaping

Number	Question
1	What type of septic tanks does your city have?
2	Are the septic tanks constructed as per specifications in the building by-laws?
3	Who builds the septic tanks?
4	How are the septic tanks emptied?
5	Who empties the septic tanks?
6	How is the faecal sludge treated?
7	Where does the faecal sludge go after collection?
8	Do you have a functional sewage treatment plant in the city?
9	Have you attended or received any capacity building activities on sanitation?
10	Do you have any recommendations for us on the platform and how it will support cities for your city/state?
11	Other information gathered

Notes:

Sanitation
Capacity Building Platform

Goal

To build the capacity of cities and other stakeholders working in urban sanitation to ensure improved delivery of sanitation services through decentralized approaches.

What is the Sanitation Capacity Building Platform?

Sanitation Capacity Building Platform (SCBP) is designed to support and build the capacity of towns/cities to plan and implement decentralized sanitation. The platform also aims to facilitate knowledge and experience sharing among cities on decentralized. Decentralized sanitation is a key solution to accomplish national missions like Swachh Bharat Mission, AMRUT, Smart Cities Mission and Namami Gange programme.

The platform supports the Ministry of Urban Development (MoUD), Govt of India's focus on urban sanitation. It assists states and cities to move beyond open defecation free status by addressing safe disposal and treatment of human faeces.

Assess the needs → Develop a capacity building programme → Coordinate with partners → Provide customized capacity building activities → Monitor progress

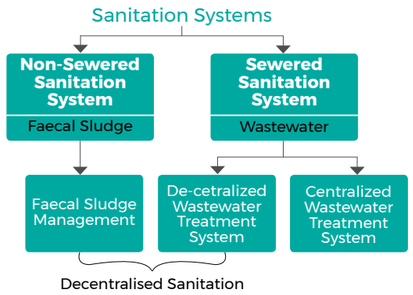
How Does the Platform Work?

National Institute of Urban Affairs (NIUA) is the anchor organization for this platform which comprises a network of partners who are credible national and international expert agencies. These partners include prominent universities, training centres, resource centres, nongovernmental organizations, consultants and experts such as CEPT University, CDD and BORDA, iDeCK, ASCI, CPR, CSE, WASHi and UMC.

NIUA actively reaches out to towns and states to understand the sanitation situation, assess needs, and develop customized capacity building programmes. NIUA then connects each state and city with the appropriate capacity building partners of the platform. The partners deliver capacity building activities for all stakeholders involved in sanitation value chain, including officials from Urban Local Bodies (ULBs), elected representatives and private sector. NIUA responds to requests and enquiries from states and cities.

Why Decentralized Sanitation?

Ambitious goals of various national missions such as Swachh Bharat Mission, AMRUT and the Smart Cities Mission cannot be achieved solely through conventional, centralized wastewater treatment systems. Given that, 49% of the urban population in India relies on on-site sanitation such as septic tanks and pits, decentralized sanitation options such as Faecal Sludge Management (FSM) and Decentralized Wastewater Treatment Systems are very much critical for achieving the goals for urban sanitation under various national missions. Decentralized sanitation options are scientifically proven solutions to complement centralized systems, serving the underserved, particularly in peri-urban areas and informal settlements.



Faecal Sludge Management is the collection and transportation of faecal sludge from containment system, treatment of the sludge in a designated site, and then safe disposal or reuse of the treated sludge. Decentralized Wastewater Treatment Systems comprises of sewers to convey domestic wastewater from a neighbourhood or local catchment to a small, local treatment plant where it is treated through a natural processes without any requirement for external energy to operate the system.

Services Offered

- Undertaking FSM situation assessment and diagnostic study of existing sanitation situation of cities
- Orientation and exposure visits for state and ULB officials and elected representatives for understanding Septage and Faecal Sludge risks and challenges
- Supporting national, state and city level FSM Policy and Regulatory reforms
- Institutional capacity strengthening of nodal state/regional level Training Institutions for delivering high quality FSM Trainings
- Facilitating capacity building activities for stakeholders involved in the FSM value chain - government officials, masons, private sector
- Creating knowledge resources and advocacy material on FSM technology, institutional, legal and financial eco-systems
- Preparation of model Detail Project Report (DPRs) for FSM and Learning materials
- Promoting Behaviour Change for moving beyond Open Defecation free status.

Capacity Building

- Orientation and exposure visits for understanding Septage and Faecal Sludge risks and challenges
- Institutional capacity strengthening through training of trainer programmes
- Capacity building activities for stakeholders involved in the FSM value chain - government officials, masons, private sector
- Creating knowledge resources and advocacy material on FSM technology, institutional, legal and financial eco-systems

Planning

- Baseline data collection on FSM
- FSM situation assessment
- Diagnostic study of existing sanitation situation
- Stakeholder mapping and analysis
- Analysis of legal and institutional framework
- Policy and guideline formulation

Implementation

- Model DPRs for Faecal Sludge Treatment Plants and Decentralized Wastewater Treatment System
- Planning for emptying and transport services
- Transaction advisory for FSM
- Designing of Behaviour Change Strategy

Partners of the Platform

Currently there are 8 partners delivering capacity building services on decentralized sanitation. Partners have extensive experience working in the sanitation sector in India and internationally. They have worked closely with many cities in various states and have an excellent understanding of the context and stakeholders. Additional partners will be added to the platform in the future.

About NIUA

NIUA is a premier national institute for research, capacity building and dissemination of knowledge in the urban sector, including sanitation. Established in 1976, it is the apex research body for the Ministry of Urban Development (MoUD), Government of India.

NIUA is also the strategic partner of the MoUD in capacity building for providing single window services to the MoUD/States/ULBs.

The Institute includes amongst its present and former clients, the Ministry of Urban Development (MoUD), the Ministry of Housing & Urban Poverty Alleviation (MoHUPA), Housing and Urban Development Corporation (HUDCO), the Planning Commission of India, City and Industrial Development Corporation (CIDCO) of Maharashtra USAID, World Bank, Asian Development Bank, GIZ, UNICEF, UNEP, UNOPS, Cities Alliance, Bill & Melinda Gates Foundation, Rockefeller Foundation, Global Green Growth Institute (GGGI), and the Bernard van Leer Foundation (BvLF). Some of the major areas of work include:

- Provide research support to MoUD
- Conduct research studies on contemporary urban issues
- Coordinate capacity building and training activities
- Disseminate information through networks and knowledge hubs
- Analyze and promote policy change agenda
- Monitor and evaluate Government of India's urban programs/schemes

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