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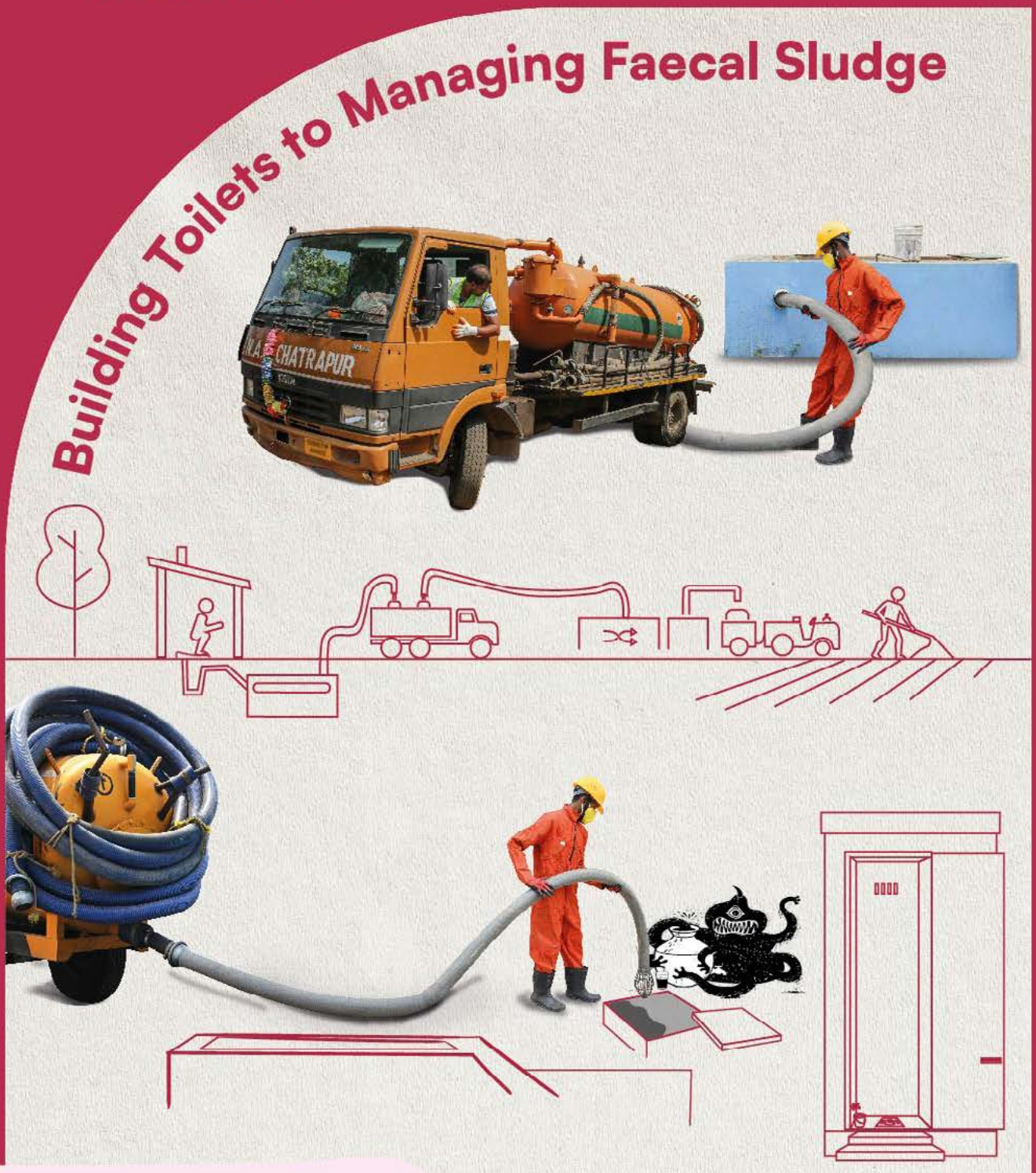
Building Toilets to Managing Faecal Sludge



Chronicling the UNICEF-BMGF FSSM Initiative

Assam, Chhattisgarh, Jharkhand and Madhya Pradesh

2021—2024

With the support of AIILSG

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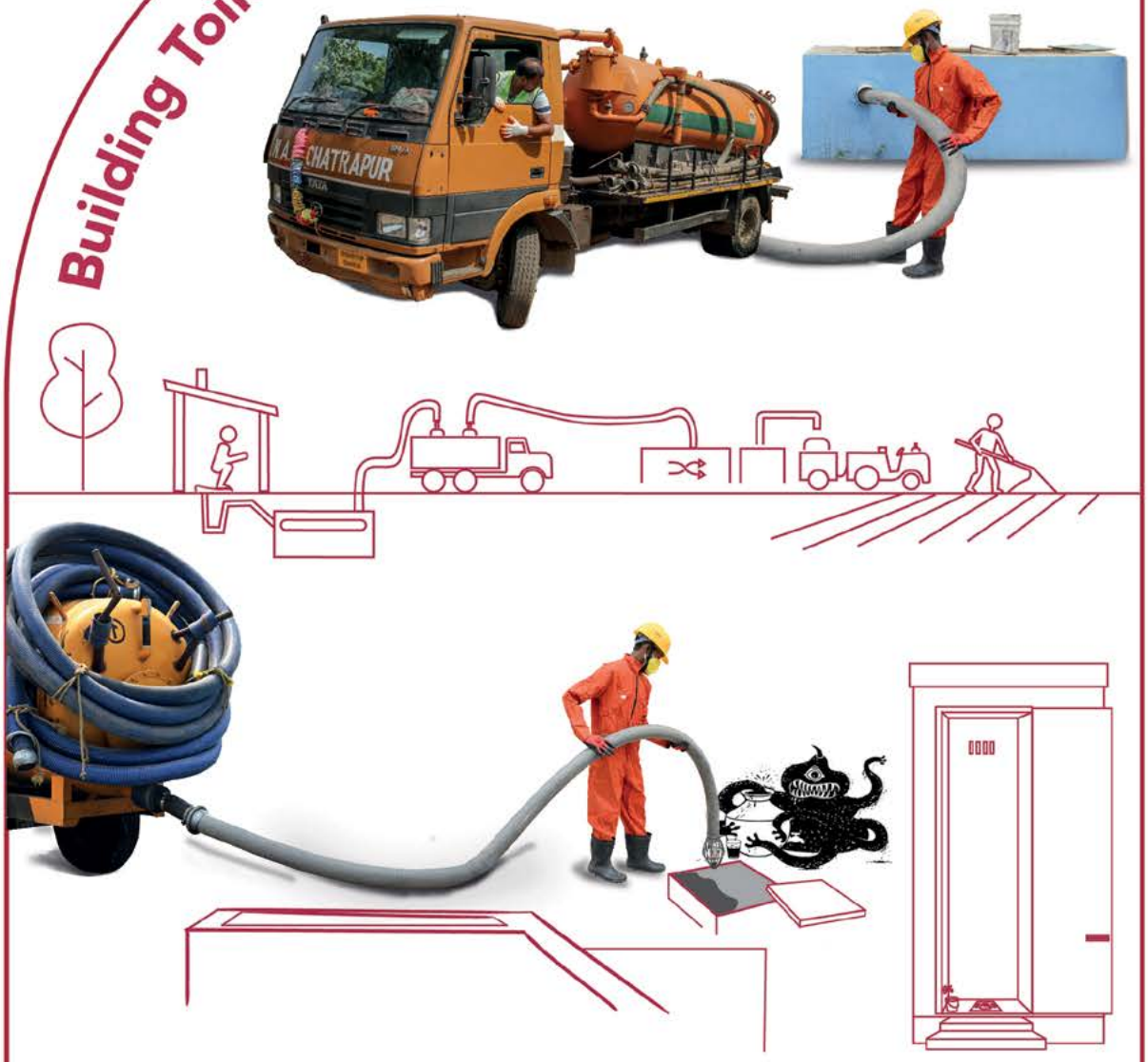

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UNICEF works to promote and protect the rights of children across India.

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Supported by State NGO partners: NEEDS, WaterAid, Samarthan, Women Development Centre (WDC)

Photo credits: UNICEF India

Acknowledgement

UNICEF acknowledges the opportunity to collaborate and partner with State Governments of Assam, Chhattisgarh, Jharkhand and Madhya Pradesh and sector agencies for this initiative. This helped UNICEF deliver on its mandate of promoting children's rights, helping meet their basic needs, and expanding their opportunities to reach their full potential.

UNICEF India would like to extend our heartfelt thanks to Bill and Melinda Gates Foundation (BMGF) for their collaboration for the FSSM project from 2021-24. This contributed to UNICEF's efforts on partnering with the Government on moving towards safely managed sanitation and the Sustainable Development Goal 6.

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Foreword

The Swachh Bharat Mission, launched in 2014, has made significant strides in improving and expanding sanitation services to communities across India. UNICEF has supported the Government of India and 16 state governments in this effort, contributing in many areas to the remarkable progress of over 550 million people getting access to toilets at the household level, over the past 10 years.

Under the sustainable development goal to be achieved by 2030, the target is not restricted to just toilet access but a better-quality sanitation service level. To this end, the sanitation target 6.2 tracks *'the proportion of population that is using an improved sanitation facility, which is not shared with other households, and where the excreta produced is either (i) treated and disposed in situ; or (ii) stored temporarily and then emptied and transported to treatment off-site'.* Thus, one of the focus areas is now Faecal Sludge Management (FSM), which requires the setting up of the entire sanitation value chain from safe confinement to safe treatment and disposal.

UNICEF and Bill and Melinda Gates Foundation (BMGF) came together to work with the state governments of - Madhya Pradesh, Chhattisgarh, Assam, and Jharkhand — supporting them in their efforts to develop and adopt FSM policies and programmes and set up services. The support was provided through Technical Support Units (TSUs) in each state which helped in statewide interventions on capacity building, social behavioural change communication, monitoring and knowledge management. Specific support was also provided to two Urban local Bodies in each state. Monitoring and reporting of FSM across all four states was also prioritized and an FSM management dashboard is now being put in place under the central governments Urban *Platform for delivery of Online Governance* (UPYOG) platform.

The achievement in each state shows how coordinated and collaborative efforts, between stakeholders — state and local governments, TSU, national sector partners from the NFSSM alliance, local civil society and local communities, can lead to sustainable solutions for sanitation.

This publication, *Chronicling the UNICEF- BMGF FSSM Initiative in Assam, Chhattisgarh, Jharkhand, and Madhya Pradesh* (2021-2024), presents a documentation of many of the initiatives and processes that were rolled out and results obtained. Experiences included in here, can serve as a guide, and suggest practical solutions to support policymakers, practitioners, and stakeholders in strengthening faecal sludge management across the country.

This collaborative effort has also been documented internationally with the development of a global field note on *FSM/CWIS in India*.

I would like to express my sincere gratitude to the state government officials from the 4 states, BMGF India, the TSU members, sector organizations including the NFSSM alliance, participating local CSOs and UNICEF colleagues from the four states, for their commitment and contribution. The positive impact in the states is the result of this joint effort and the experience is now documented to create this resource material.

Finally, UNICEF commits to continue supporting the national and state governments initiatives on improving sanitation services for the well-being and development of children and communities across India.

Paulos Workneh
Chief WASH UNICEF
4 June 2024

Foreword

I am delighted to present this booklet, chronicling the UNICEF - BMGF partnership in Assam, Chhattisgarh, Jharkhand, and Madhya Pradesh (2021-2024) for Faecal Sludge & Septage Management (FSSM). This booklet showcases a diverse set of initiatives capturing the innovative approaches of the partnership implemented in four states of India. It is a testimonial to our shared commitment to advancing safely managed sanitation solutions across India.

Since the launch of the Swachh Bharat Mission (SBM) in 2014, sanitation has garnered significant attention improving access to toilets considerably across urban and rural areas. In India, however, with limited coverage of the sewerage network, most of the toilets remained connected to on-site sanitation systems, e.g. septic tanks/pits, necessitating the need for management and treatment of the faecal waste being generated and collected in these systems.

This need presented a multifaceted challenge with far-reaching implications for millions of individuals. Beyond the immediate health risks posed by untreated waste, deficient sanitation infrastructure perpetuated inequalities, particularly among low resource settlements and groups lacking adequate sanitation facilities. These challenges and the need for faecal sludge and septage management were recognized by the national and state governments. The Ministry of Housing and Urban Affairs issued a national policy on FSSM in 2017, underscoring the need to focus on the entire sanitation value chain, from safe containment to treatment and disposal. The second phase of SBM has also made this central to its Used Water Management initiatives.

At the Gates Foundation, we firmly believe in the power of collaboration. Our partnership with UNICEF exemplifies this belief. We are proud that a diverse range of stakeholders, including central and state governments, academia, research institutions, technical agencies, CSOs, and the private sector, have come together to support FSSM initiatives in these four states. This collective effort demonstrates the power of collaboration in achieving sustainable sanitation solutions for our communities. The progress of FSSM in the four states has indeed been remarkable, with the state governments prioritising safely managed sanitation solutions, vital to safeguarding the environment and public health.

The National Faecal Sludge and Septage Management (NFSSM) Alliance, comprising key sector leaders and organizations across academia, civil society, research, and technical spheres, where UNICEF and Gates Foundation are also partners, has also played a crucial role in coordinating efforts, sharing knowledge and best practices from across India, and supporting effective implementation of initiatives. Going forward such collaborative platforms can partner with governments to overcome barriers and accelerate progress towards achieving universal access to safely managed sanitation.

In conclusion, I extend my congratulations to the UNICEF team, state and local government officials and other partners working on this project for the immense progress achieved. I also appreciate the efforts put into developing this booklet that captures solutions and practices and hope that these lessons can be disseminated widely.

Sakshi Gudwani

Sakshi Gudwani
Bill & Melinda Gates Foundation

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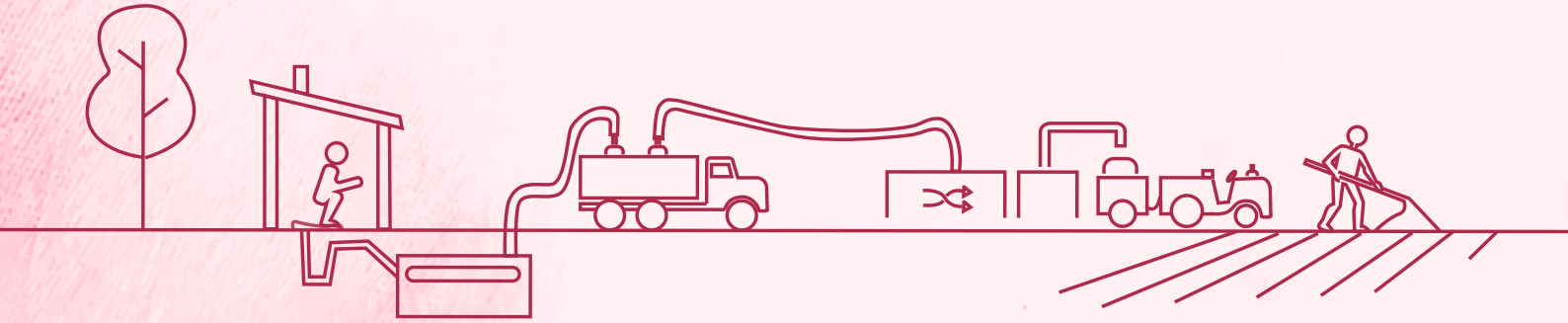
Acronyms

ADB	Asian Development Bank
ALF	Area-Level Federation
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
AnMBR	Anaerobic Membrane Bioreactor
ASP	Activated Sludge Process
AIILSA	All India Intitute of local Self-Government
BCC	Behaviour Change Communication
BMGF	Bill and Melinda Gates Foundation
CB	Capacity Building
CPCB	Central Pollution Control Board
CPHEEO	Central Public Health and Environmental Engineering Organisation
CSE	Centre for Science and Environment
CWIS	Citywide Inclusive Sanitation
DEWATS	Decentralized wastewater treatment system
DoHUA	Department of Housing and Urban Affairs
DPR	Detailed Project Reports
DRE	Deep Row Entrenchment
DUAD	Directorate of Urban Administration and Development
ERSU	Emergency Response Sanitation Unit
FC	Finance Commission
FS	Faecal Sludge
FSM	Faecal Sludge Management
FSSM	Faecal Sludge and Septage Management
FSTP	Faecal Sludge Treatment Plan
GHSD	Green house solar driers
GI	Galvanized iron

HH	household
IEC	Information, Education and Communication
INR	Indian rupee
IPC	Interpersonal communication
IS	Indian Standard
IT	Information technology
JICA	Japan International Cooperation Agency
KAP	Knowledge, attitude and practice
KLD	Kilo Litres Per Day
LIC	Life Insurance Corporation
LPCD	Litres per capita per day
MBBR	Moving bed biofilm reactor
MLA	Member of the Legislative Assembly
MLD	Million litres per day
MoHUA	Ministry of Housing and Urban Affairs
MoU	Memorandums of understanding
NEEDS	Network for Enterprise Enhancement & Development Support
NGO	Non-governmental organization
NGT	National Green Tribunal
NIUA	National Institute of Urban Affairs
NMB	Nagaon Municipal Board
NUDM	National Urban Digital Mission
NULM	National Urban Livelihood Mission
O&M	Operation and maintenance
ODF	Open Defecation Free
PCB	Pollution Control Board
PGF	Planted gravel filter
PHED	Public Health Engineering Department
PMAY	Pradhan Mantri Awas Yojana
PPE	Personal protective equipment

QR	Quick Response Code
SBC	Social behaviour change
SBCC	Social and Behaviour Change Communication
SBM	Swachh Bharat Mission
SBR	Sequencing Batch Reactor
SDB	Sludge Drying Bed
SDG	Sustainable Development Goals
SHG	Self-help group
SHS	Swachhata Hi Seva
SIPRD	State Institute of Panchayats and Rural Development
SLRMC	Solid Liquid Resource Management Centre
SoP	Standard Operating Procedure
SRLM	State Rural Livelihood Mission
STP	Sewerage Treatment Plant
SUDA	State Urban Development Agency
SWM	Solid waste management
TA	Technical assistance
TBF	Tiger Biofilter Technology
TS	Total solids
TSS	Total suspended solids solids
TSU	Technical Support Unit
UADD	Urban Administration and Development
UDHD	Urban Development and Housing Department
ULB	Urban Local Bodies
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UPYOG	Urban Platform for Delivery of Online Governance
UW	Used Water
UWM	Used water management
WASH	Water, Sanitation and Hygiene
WDC	Women Development Centre

A NATIONAL-LEVEL INTERVENTIONS



A 1: The FSSM Project and Highlights from Four States: Madhya Pradesh, Chhattisgarh, Jharkhand and Assam

Introduction

This article provides a comprehensive overview of sanitation and waste management efforts in the states of Assam, Chhattisgarh, Jharkhand and Madhya Pradesh. Each state has made significant strides in improving urban sanitation through various initiatives, policies and infrastructure development. The data presented here showcases the progress made and challenges faced by these states in their journey towards achieving sustainable sanitation solutions.

Group photograph of representatives from BMGF, UNICEF and AIILSG

Background

The UNICEF-Bill and Melinda Gates Foundation (BMGF) joint initiative embarked on a transformative journey in India from 2021 to 2024, focusing on the critical issue of Faecal Sludge and Septage Management (FSSM). This collaborative effort aimed to address the pressing challenges surrounding sanitation and hygiene, particularly in urban and peri-urban areas, where access to safe sanitation facilities remains a significant concern.

India, home to a vast and diverse population, grapples with the daunting task of ensuring adequate sanitation services for its citizens. There has been commendable progress in recent years, and sanitation access has significantly increased. With the Sustainable Development Goals, the bar has been raised with the focus now on managing faecal sludge, the byproduct of human waste, which poses a formidable threat when not managed effectively. Inadequate treatment and disposal of faecal sludge contributes to water contamination, soil pollution, and the spread of diseases, perpetuating a cycle of public health crises and environmental degradation.

Recognizing the urgency of the situation, UNICEF and BMGF joined forces to implement a comprehensive FSSM project in India, with

a multi-faceted approach aimed at addressing various aspects of sanitation and hygiene. The project focused on bolstering institutional capacities, promoting behaviour change, fostering community participation, and deploying innovative technologies to improve faecal sludge management practices across different urban settings.

The Project

The UNICEF-Bill and Melinda Gates Foundation (BMGF) joint initiative, spanning from 2021 to 2024, aimed to address the critical issue of Faecal Sludge and Septage Management (FSSM) in India, particularly in urban and peri-urban areas. BMGF's longstanding focus on urban sanitation globally, including in India, and UNICEFs strong presence in and close relationship with state governments, provided the foundation for this collaboration, which sought to enhance FSM services and promote sustainable sanitation practices.

The project's conceptualization involved a strategic partnership between UNICEF's WASH Programme and BMGF's program, focusing on supporting select states — Madhya Pradesh, Chhattisgarh, Jharkhand, and Assam — in implementing FSM. By leveraging existing resources, institutional capacities, and networks, the project aimed to drive significant outcomes across multiple fronts.

Key objectives of the project included enhancing the regulatory framework for FSSM through state-specific policies, strengthening the capacity of local authorities and sanitation service providers, raising awareness about the importance of safe sanitation practices, and facilitating the adoption of sustainable and cost-effective technologies for faecal sludge treatment and disposal with support of partner AIILSG.

Throughout the project duration, the team collaborated closely with government agencies, non-governmental organizations (NGOs), community groups, and other stakeholders to ensure a holistic and inclusive approach to FSSM. Capacity-building initiatives, training workshops, and knowledge-sharing platforms were instrumental in empowering local communities and fostering ownership of sanitation facilities and services.

By leveraging partnerships, harnessing innovation, and promoting community engagement, the UNICEF-BMGF FSSM project endeavoured to contribute to the larger goal of achieving universal access to safe sanitation and hygiene in India. Through targeted interventions and strategic investments, the project aimed to lay the groundwork for sustainable and equitable development, ensuring that no one is left behind in India's journey towards a healthier and more prosperous future.

The primary outcomes included advancing FSM services at the state level, increasing the volume of treated faecal sludge by 25 per cent, rolling out comprehensive communication campaigns for ODF sustainability and FSM, and strengthening institutional capacities for effective sanitation service delivery.

To achieve these outcomes, the project outlined key results and areas of intervention. These included strengthening FSM programs through partnerships, establishing Technical Support Units (TSUs) in target states, identifying and promoting innovative FSM models, enhancing the capacity of relevant departments, and implementing social and behaviour change communication (SBCC) campaigns. Additionally, the project aimed to develop policy frameworks, stimulate market demand for sanitation services, and enhance private sector engagement.

The scope of work encompassed setting up TSUs, engaging stakeholders to inform sanitation policies, accessing existing FSM initiatives, preparing detailed project reports, capacity strengthening, effective monitoring, and knowledge sharing. States developed citywide sanitation plans including multiple methods of FSM coverage including STPs with Sewerages and FSTPs — both large mechanical systems as well as nature-based

solutions. Furthermore, the partnership aimed to contribute to global and regional dialogue on sanitation, intensify cross-learning, and support UNICEF's leadership in urban WASH initiatives.

Key aspects of the project included promoting cross-sectoral collaboration, leveraging existing resources, fostering innovation, and emphasizing social and behaviour change communication. By harnessing the strengths of both UNICEF and BMGF, the project aimed to catalyse sustainable solutions to the challenges of FSM in India, contributing to the country's broader sanitation goals and reinforcing its leadership in the global sanitation dialogue.

Broad Achievements and Results

The project had four outcomes and the summary achievements were as follows.

Outcome 1: Advancement of FSM Services in Urban Areas

Outcome Indicator 1.1: Policy and strategy launched by state urban department. Significant progress has been made in policy formulation and strategy development across the four focus states. Assam successfully developed its new FSSM policy and held stakeholder consultation. In Madhya Pradesh, the revised policy was adopted and launched by the state government, while Chhattisgarh and Jharkhand continued the roll-out of existing policy provisions with proposed amendments under consultation.

Outcome Indicator 1.2: Operational guidelines for FSM chain launched/government order, etc. Operational guidelines and SOPs were developed and implemented across various areas of FSM implementation in all four states. These guidelines facilitated the operationalization of FSM policies and strategies, contributing to the achievement of project objectives. In Madhya Pradesh, SOPs for sewer and septic tank cleaning, and FSTP Operation and maintenance (O&M), in Chhattisgarh, a guidance note on Used Water Management with a decision matrix for nature-based decentralized treatment technologies and SOPs on faecal sludge collection, conveyance, and treatment and in Assam draft FSSM operational guidelines and related Bye laws have been developed.

Outcome Indicator 1.3: Monitoring and QA systems established. Efforts were focused on establishing effective state level monitoring frameworks and systems to ensure the sustainable scaling up of FSSM initiatives. Enhanced monitoring frameworks at the state

Site visit in Assam by BMGF and UNICEF officials

level provided effective oversight and evaluation of FSSM projects, facilitating informed decision-making. An IT-based FSSM reporting and monitoring tool is developed using the Government of India's UPYOG platform enabling reliable data collection and analysis.

Outcome 2: Increase in Faecal Sludge Treatment

Outcome Indicator 2.1: FSTPs in different stages. Collaborative efforts led to the establishment and/or upgrading of Faecal Sludge Treatment Plants (FSTPs) across the four states. Also, STPs are planned in many ULBs. Multiple facilities were developed or upgraded in focus ULBs, enhancing faecal sludge treatment capacity and contributing to the project's goal of increasing the volume of treated faecal sludge.

Outcome Indicator 2.2: Co-treatment in operational STPs activated in targeted ULBs. Advocacy for co-treatment arrangements in Sewage Treatment Plants (STPs) resulted in the inclusion of co-treatment as part of state policies across all states. Plans for co-treatment implementation were initiated in operational STPs, aligning with national FSSM guidelines and contributing to enhanced faecal sludge management.

Outcome 3: Comprehensive Communication Campaigns

Outcome Indicator 3.1: Launch of BCC campaign by state and ULBs. Focused efforts were made to develop and implement FSSM communication strategies in each focus state, addressing key components of the program. These strategies aimed to raise awareness about safe sanitation practices, FSTPs, and gender equity, contributing to behaviour change and community engagement.

Outcome Indicator 3.2: SBCC campaigns/ approaches adapted and localized. A variety of communication tools and collaterals were created at the state level, tailored to local contexts and sensitivities. Existing content on FSM was adapted to local requirements, utilizing diverse pathways and tools for effective communication. A very successful adaptation was the localization of the national Malasur campaign. Collaboration with partners such as the NFSSM alliance facilitated content adaptation and dissemination.

Outcome Indicator 3.3: Government. Budgets committed and utilized for BCC. Efforts were made to advocate for government funding for FSSM communication activities, although challenges existed with regards to actual fund allocation. UNICEF provided some funds for communication activities in some cases, supplementing government allocations to support effective BCC campaigns.

Outcome 4: Institutional Strengthening

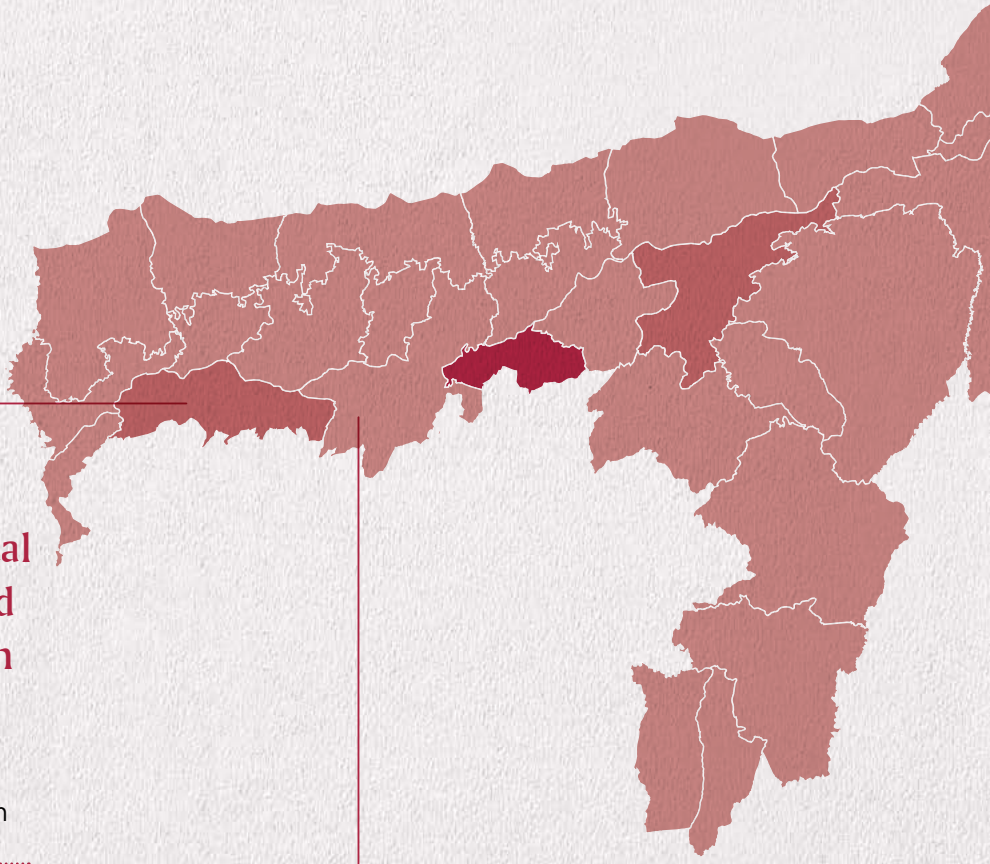
Outcome Indicator 4.1: Number of trainings conducted for different stakeholders. Extensive capacity-building initiatives were undertaken, engaging stakeholders at the state and ULB levels. 144 workshops, consultative workshops, and training programs facilitated knowledge transfer and skill development in various aspects of FSSM planning, technology, operation, and maintenance, in which 18,653 stakeholder trained in FSM solution and practices. Extensive interstate knowledge exchange visit were organized for all four states. These visits were to states where FSM has been seen progress like Telangana, Odisha, and Maharashtra. Collaboration with sector players such as CSE, ASCII, and NIUA contributed to the success of capacity-building efforts.

Learnings and Possible Way Forward

The project highlighted the importance of collaborative partnerships, sustained and evidence driven policy advocacy and capacity building in advancing FSM services in urban areas. Key learnings include the significance of stakeholder engagement, adaptive communication strategies, and

effective monitoring and evaluation systems. Moving forward, sustained advocacy for policy support and increased government funding for communication activities will be essential. Strengthening institutional capacities and fostering cross-sectoral collaboration will continue to be priorities for sustaining and scaling up FSM initiatives in India. Ongoing knowledge sharing and capacity-building efforts will further contribute to achieving universal access to safe sanitation and hygiene, driving progress towards the Sustainable Development Goals.

Assam



Urban Local Bodies and Population

Total ULBs

104 Including Guwahati Municipal Corporation

Urban Population

21.2 million
(**27.6%** of state population)

Faecal Sludge and Septage Management

FSTPs and STPs

3 operational FSTPs

29 more planned

12 STPs in development

Technologies for FSSM

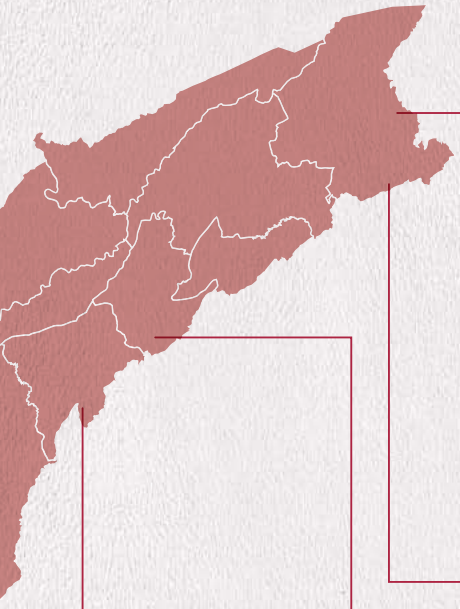
Tiger biofilter, MBBR, geo-tube, Hybrid MBBR, **DEWATS**

Capacity

352 KLD handled by operational FSTPs

JICA Involvement

Guwahati Sewerage Project includes **3 STPs** (187 MLD)



Open Defecation Free Status

ODF Declaration

53 ODF+ cities and **42** ODF cities as of 2024

ODF Certification

21 ULBs certified in 2021

Policy and Institutional Framework

State FSSM Policy and Bylaws
Developed

Desludging SOP
Established for **regular and systematic desludging operations**, pending rollout

FSSM Dashboard
Implemented via **UPYOG platform**

Key Achievements

Infrastructure Development
Significant investments in **FSTPs and STPs**

Desludging Services
83 cesspool vehicles

ODF Status
Increased **ODF+ and ODF-certified cities**

Effluent Testing
Lab under construction with **Nagaon FSTP for water quality testing**

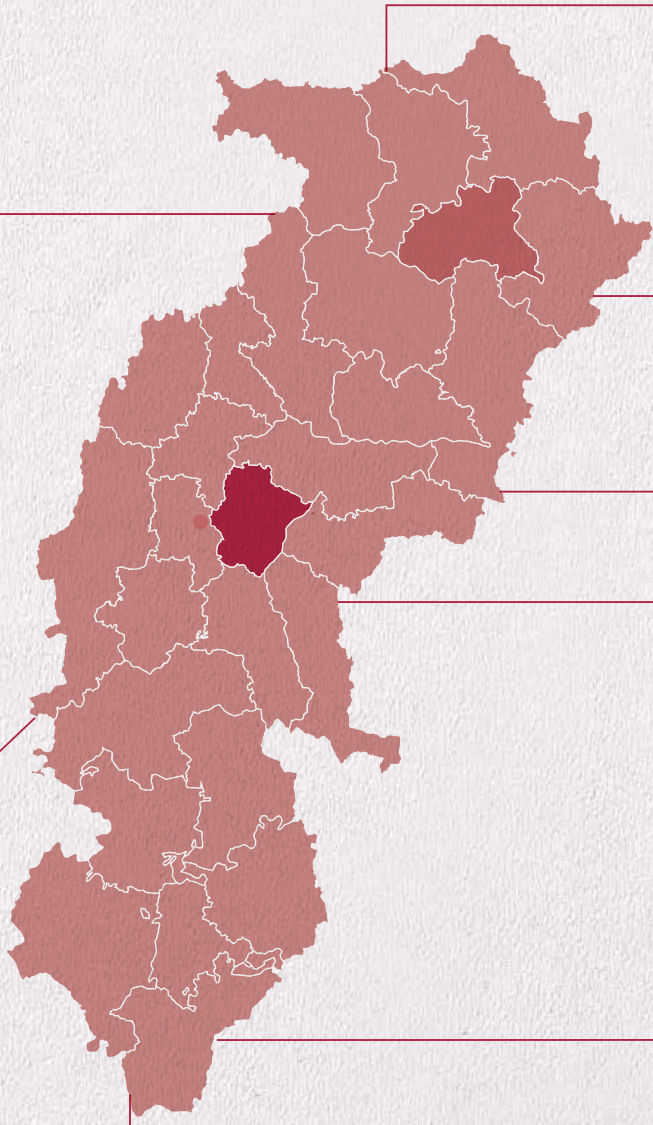
Capacity Building and Community Engagement

Training Programs
For ULB officials, **sanitation workers, community members**

IEC and BCC Campaigns
Street plays, **wall paintings, sanitation marches, social media**, community radio

Capital city
ULBs

Chhattisgarh



Urban Local Bodies and Population

Total ULBs **169**

- **14** Municipal Corporations
- **43** Municipal Councils
- **112** Town Panchayats

Urban Population Approximately **5.95 million** (**23.24%** of state population)

Faecal Sludge and Septage Management

FSTPs **158** Faecal Sludge Treatment Plants operational as of March 2024

STPs **11** Sewage Treatment Plants manage urban waste

Desludging Services

Scheduled desludging started in **Ambikapur**

Capacity Building and Community Engagement

Training Programs

Over **200** functionaries and sanitation workers **trained on FSSM practices**

SBCC Campaigns

Reached over **40,000** people **promoting proper sanitation practices and toilet usage**

Information, Education, and Communication and Behaviour Change Communication

Awareness Campaigns
Various **multimedia campaigns** and **interpersonal communication** strategies conducted

Community Engagement
Active participation from local communities through targeted SBCC strategies

Open Defecation Free Status

ODF Declaration
All ULBs declared ODF in 2017

ODF++ Certification
Achieved in 2020, ensuring comprehensive sanitation coverage

Policy and Institutional Framework

State FSSM Policy
Adopted in 2017

State Urban Sanitation Policy
Launched in 2018 for comprehensive urban sanitation

Technical Support
Provided by UNICEF, including establishing a Technical Support Unit (TSU)

Key Achievements

Swachh Survekshan Performance
Consistently ranked top in national cleanliness surveys from 2019 to 2021

Recognition and Awards

- **UN 3R Forum Award**
- **Swachhata Excellence Award**
- **IEC HUDCO Award for Innovation**
- **Ambikapur recognized as the cleanest small city for four consecutive years**

Policy Implementation
Successful implementation of state policies has significantly improved urban sanitation

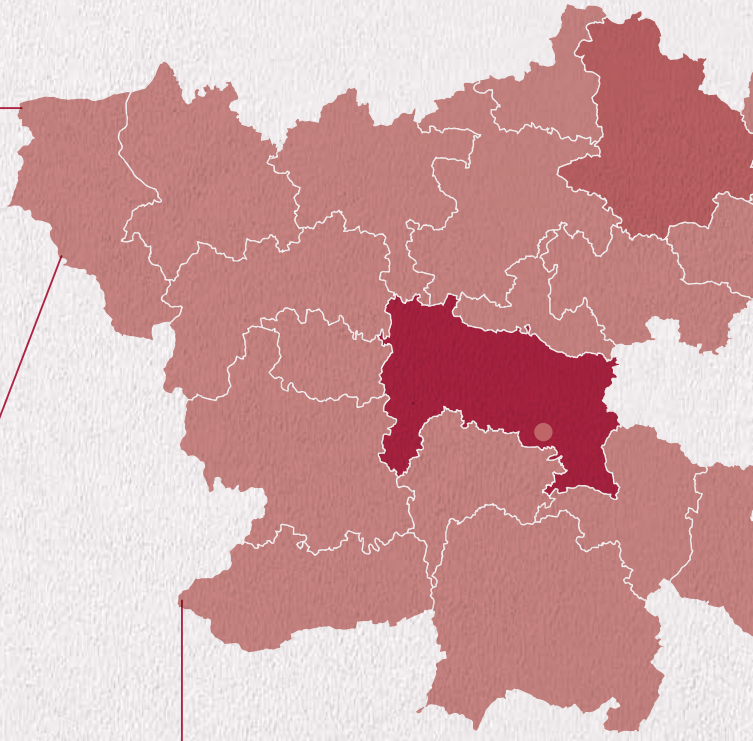
Monitoring and Evaluation

Helpline (1100)
Dedicated phone line for scheduling septic tank emptying services

Guidance and Assessment
Comprehensive monitoring and quality assurance frameworks developed

Capital city
ULBs

Jharkhand



Urban Local Bodies and Population

Total ULBs
47

- **5** Municipal Corporations
- **42** Municipal Councils/ Nagar Panchayats

Urban Population

Approximately **8.6 million** (**24.1%** of the state's total population)

Faecal Sludge and Septage Management

FSTPs and STPs

10
Operational Faecal Sludge Treatment Plants (FSTPs)

8
Additional FSTPs under construction

7
Sewage Treatment Plants (STPs) with a total capacity of **450 MLD** in development

Technologies Employed

- Anaerobic baffled reactor
- Planted drying beds
- Decentralized wastewater treatment system (DEWATS)
- Co-composting

Capacity

Existing FSTPs treat **200 KLD** of faecal sludge

Capacity Building and Community Engagement

Training Programs

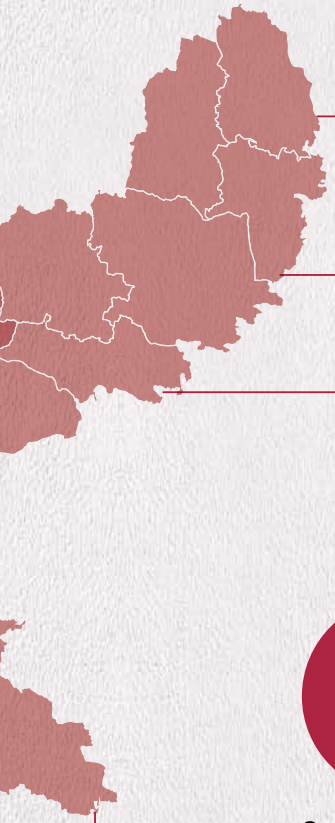
Extensive **training for ULB officials, sanitation workers, and community members** on FSSM practices

Self-Help Groups (SHGs)

Involved in the **maintenance and operation of community and public toilets**

IEC and BCC Campaigns

- **Awareness campaigns** using multimedia, social media, and community radio
- Programs such as **street plays, wall paintings**, and **sanitation drives** to educate the public
- **Collaboration with development partners** for advisory and execution support



Open Defecation Free Status

ODF Declaration
All ULBs declared ODF as of 2024

ODF++ Certification
Achieved by 15 ULBs

Policy and Institutional Framework

State FSSM Policy
Adopted to guide sanitation and septage management efforts

Scheduled Desludging SoP
Initiated for systematic and periodic desludging

FSSM Dashboard
Established for state-level monitoring and tracking

Key Achievements

Swachh Survekshan
Significant participation, with many ULBs achieving high rankings

Sanitation Infrastructure
Increased investments in FSTPs and STPs for effective waste management

ODF Status
All ULBs declared ODF, with a growing number achieving ODF++ status

Recognition and Awards
Several accolades for excellence in urban sanitation and innovative waste management practices

Monitoring and Evaluation

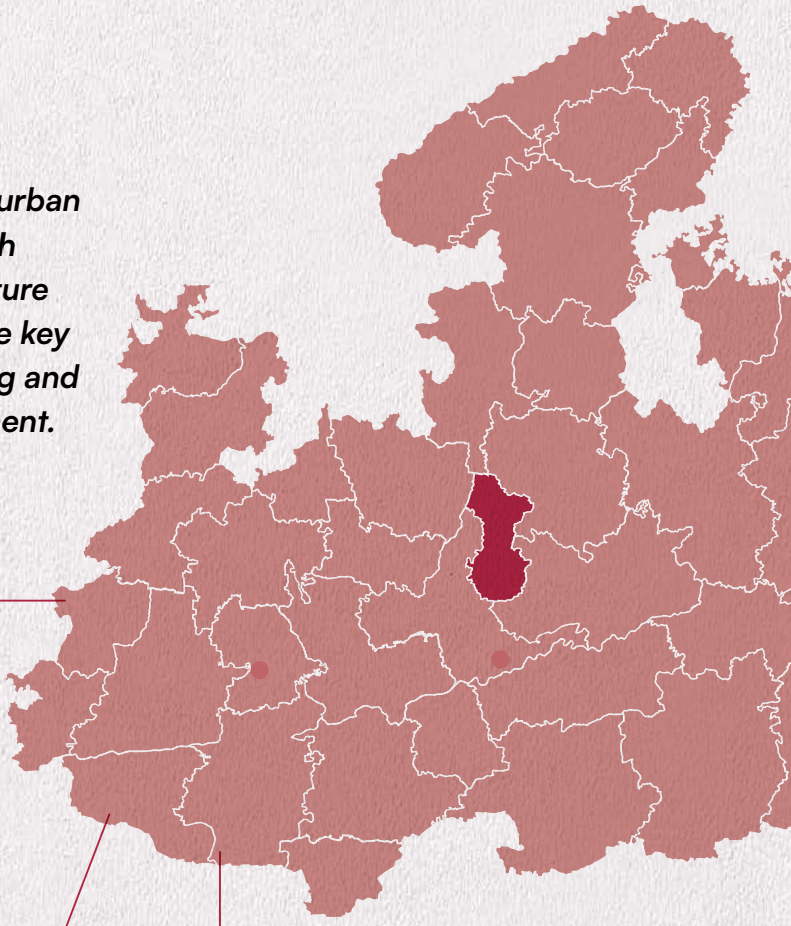
Desludging Services
Dedicated helplines and mobile applications for scheduling services

Surveys and Competitions
Active participation in Swachh Survekshan to benchmark and improve sanitation standards

Capital city
ULBs

Madhya Pradesh

has made significant strides in improving urban sanitation and waste management through various initiatives, policies, and infrastructure developments. This article summarizes the key highlights of the state's efforts in achieving and maintaining a clean and healthy environment.



Urban Local Bodies and Population

Total ULBs **407**

- **16** Municipal Corporations
- **98** Municipal Councils
- **293** Municipalities

Urban Population **21.2 million** (**27.6%** of state population)

Faecal Sludge and Septage Management

FSTPs **400** Faecal Sludge Treatment Plants

STPs **115** Sewage Treatment Plants (1808.5 MLD capacity)

Mechanized Cleaning **80%** of ULBs use vacuum trucks

Capacity Building and Community Engagement

Training Programs

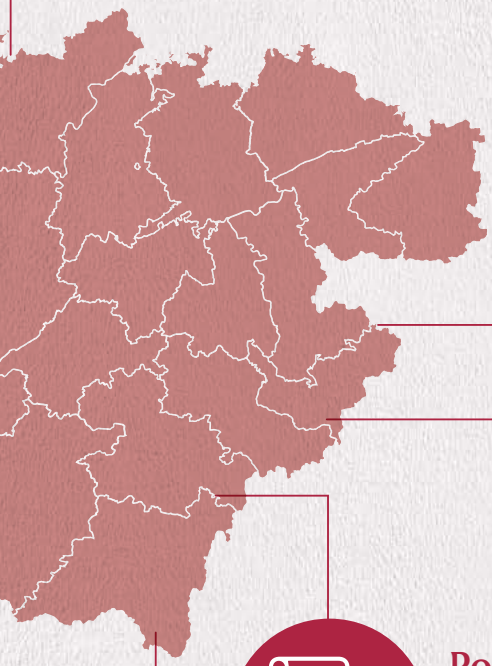
For **sanitation workers** and **ULB functionaries**

SHGs

Operate and **maintain** community and public toilets

Safai-Mitra Suraksha Challenge

Ensures **worker safety** and **mechanized cleaning**



Information, Education, and Communication and Behaviour Change Communication

Awareness Campaigns
"Malasur" campaign reached
50,000+ people

Community Engagement
Use of **multimedia** for **awareness**

Open Defecation Free Status

ODF Declaration
All ULBs in 2017

ODF++ Certification
Achieved in 2020

Policy and Institutional Framework

Management Policy
Launched in March 2024

Technical Support
Provided by government agencies

Key Achievements

Swachh Survekshan 2023

368 ULBs participated

361 ODF++

7 water plus

Sanitation Infrastructure
Significant **investments in FSTPs and STPs**

Recognition and Awards
For excellence in **urban sanitation** and **innovation**

Monitoring and Evaluation

Desludging Requests
Dedicated **phone numbers** and **central helpline**

Surveys and Competitions
Participation in Swachh Survekshan

Capital city
ULBs

Conclusion

The states of Assam, Chhattisgarh, Jharkhand and Madhya Pradesh have made remarkable progress in urban sanitation and waste management, each implementing unique strategies and developing infrastructure to address their specific challenges.

Assam has made substantial progress, with 53 cities achieving ODF+ status and 42 cities declared ODF. The state has operationalized three FSTPs and is developing additional treatment facilities. Assam has also implemented the UPYOG platform for monitoring sanitation efforts. UNICEF has been providing programme execution support to the state.

Chhattisgarh has focused on solid waste management, with over 70 per cent of its ULBs achieving ODF++ status. The state has invested in mechanized cleaning and faecal sludge management, with 32 FSTPs and numerous STPs under development. Community engagement and innovative waste management practices have been key drivers of Chhattisgarh's success in urban sanitation.

Jharkhand has seen notable improvements with all 47 ULBs declared ODF. The state has operationalized 10 FSTPs, with eight more under construction and seven under development. Jharkhand's approach includes engaging self-help groups (SHGs) in sanitation activities and extensive information, education, and communication (IEC) campaigns to promote proper sanitation practices.

Madhya Pradesh has made significant advances in urban sanitation with a comprehensive framework that includes over 400 Faecal Sludge Treatment Plants (FSTPs) and 115 Sewage Treatment Plants (STPs) in various stages of development. The state achieved ODF status for all Urban Local Bodies (ULBs) in 2017 and ODF++ certification by 2020. Initiatives such as the Safai-Mitra Suraksha Challenge and extensive capacity-building programmes underscore the state's commitment to sustainable sanitation.

The collective efforts of the four states have led to significant enhancements in urban cleanliness, sanitation infrastructure, and public health, setting a strong example for other regions to follow. Certain key initiatives taken under six critical domains in each state are documented in the subsequent sections of this report.

A 2: National Consultative Workshop on Used Water and Faecal Sludge Management Systems

Organized by the Government of Chhattisgarh with support of the Ministry of Housing and Urban Affairs (MoHUA), Government of India, and in partnership with UNICEF

Representatives from MoHUA, Chhattisgarh states officials and UNICEF

Introduction

Under Swachh Bharat Mission, states have made significant progress in improving sanitation in the cities by providing access to toilets and instituting measures to safely manage faecal sludge and used water. While sewerage networks were prioritized in the past, Faecal Sludge and Septage Management (FSSM) has also received attention across many states, especially in small to medium towns. Approximately 700 Faecal Sludge Treatment Plants (FSTPs) are at the planning or implementation phase in India.

Providing universal access to toilets is a key milestone in India's sanitation journey. However, the sanitation facilities can only be utilized fully when Faecal Sludge Management (FSM) facilities operate consistently and at their maximum capacity, adhering to established standards of quantity and quality. Therefore, it becomes important to perform the operation and maintenance (O&M) tasks in these facilities effectively and efficiently.

Under the Prime Minister's flagship programme, Swachh Bharat Mission (SBM), the importance of O&M has been significantly recognized. It is now evident that policymakers and project designers are more aware of the need to establish connections between improved O&M practices and the long-term sustainability of water supply and sanitation services. Consequently, there is now a greater emphasis not only on the design and construction phases but also on post-construction operation activities.

Current Status in India

In India, only around 28 per cent of sewage gets treated currently. While around 50 per cent of urban households are connected to sewerage networks, 41 per cent depend on onsite

sanitation facilities like septic tanks (Census 2011). There are gaps in the collection, conveyance and treatment of used water and faecal sludge across cities. A workshop organized in Raipur in 2023 highlighted the need of faecal sludge and used water quality monitoring.

Workshop on the status of faecal sludge (FS)

The National Consultative Workshop

Under the overall guidance of the Ministry of Housing and Urban Affairs (MoHUA), and in partnership with UNICEF, Chhattisgarh, Urban Administration and Development Department (UADD), the Government of Chhattisgarh organized a two-day National Consultative Workshop on Used Water (UW) and Faecal Sludge (FS) Management Systems in Raipur on 15—16 June 2023.

Government officials from 21 states of India actively participated in the workshop. Distinguished professionals from renowned organizations and senior government officials across the country showcased successful initiatives that had been implemented in their states and cities.

Objectives and Outcomes

The workshop aimed to develop a strategy for the O&M of faecal sludge and used water management systems, including IEC, SBCC and capacity-building components. The aim was to share learnings from various states that are implementing model FSSM and sustainable wastewater management systems at both the state and ULB levels. The workshop showcased models of excellence as lighthouse states or lighthouse ULBs on used water management and urban FSSM. It also provided opportunities for the state government to share the experiences of Chhattisgarh in the O&M area.

The expected outcomes from the workshop included the following:

- Recommendations towards strategy development for O&M of fecal sludge and used water management systems including IEC, SBCC and capacity-building components
- Learning from states with model Citywide Inclusive Sanitation (CWIS), FSSM and used water management systems, which are functional and sustainable
- Showcasing exemplary models as lighthouse states or ULBs on urban FSSM and used water management systems

Methodology

The workshop methodology included a combination of presentations, panel discussions, exhibitions, field visits, group work and interactive sessions, allowing the participants to learn from experts, share experiences and collaborate on developing recommendations for effectively managing used water and faecal sludge. An overview of all the sessions and activities is given below.

Plenary Session 1: Used Water Management

The first plenary session was chaired by Mr. V.K. Chaurasia, Joint Advisor, Central Public Health and Environmental Engineering Organisation (CPHEEO) and co-chaired by Ms. Margaret Gwada, CFO, UNICEF Madhya Pradesh. Esteemed speakers such as Chief Engineer, Mr. Shailendra Kumar Singh from Public Health Engineering Department (PHED), Government of Haryana, and Mr. V.K. Chaurasia shared

experiences and approaches to used water management in the states of Haryana and Gujarat, respectively. Mr. Ramakant Dake, Chief Officer, Municipal Council, Karad, Maharashtra, presented the sustainable practices adopted by the town of Karad in reusing treated sewage. Mr. Praveen Nagaraj, Project Director, Water Sanitation and Hygiene (WASH) Institute, provided insights on how skill development can be incorporated in O&M of urban waste (UW) and faecal sludge (FS) management systems.

Plenary Session 2: Faecal Sludge Management

The second plenary session provided insights and included discussions on various aspects of managing faecal sludge effectively. The session was chaired by Ms. Sakshi Gudwani from the Bill and Melinda Gates Foundation, with Mr. Sameer Rai, the Managing Director of SBM — Urban in Sikkim, as the co-chair. Ms. Durgesh Nandini Sahoo, Additional Secretary, OAS, Odisha, discussed the involvement of self-help groups, private sector participants, and communities in the operation and maintenance of faecal sludge treatment plants (FSTPs) in Odisha. Shri More, Chief Officer, Wai Municipal Council, Maharashtra, shared insights on the sustainable faecal sludge and septage management services implemented in the town of Wai, focusing on the town-wide approach. Ms. Kavadi, Director, RCUES, AIILSG, Mumbai, discussed the emerging issues and opportunities in used water and faecal sludge management based on the experiences in the state of Maharashtra. Dr. Chaurasia provided a comprehensive overview of the fundamentals of STPs and FSTPs, covering the basic principles and technologies involved.

Plenary Session 3: Safely Managed Sanitation

The third plenary session featured was a panel discussion chaired by Ms. Nafisa Binte Shafique, CFO, UNICEF Bihar, and co-chaired by Dr. Kaninika Mitra, CFO, UNICEF Jharkhand. The panel discussion focussed on the incremental planning required for robust and sustainable safely managed sanitation systems. Panellists from various organizations, including MoHUA, Centre for Science and Environment (CSE), Ernst & Young (EY), UNICEF Odisha and Dasra shared their insights on planning, implementation, financing, institutional mechanisms and information, education and communication (IEC) strategies.

Exhibition

An exhibition showcasing technology options and innovations in the field of water and sanitation was held concurrently with the workshop. Dr. Shivkumar Dahariya, Hon. Minister of Urban Development, Government of Chhattisgarh, inaugurated the exhibition.

Field Visits

On the second day of the workshop, participants were divided into two groups for field visits to observe and learn from an operational 90 million litres per day (MLD) STPs at Nimora, Raipur and a 6 kilolitres per day (KLD) FSTP at Kumhari Municipal Council, Kumhari. The field visits were led by the concerned municipal corporation and council.

Group Work and Presentations

After the field visits, participants engaged in group work facilitated by UNICEF. The groups discussed and developed approaches towards the O&M of used water management and faecal sludge management systems, covering planning, implementation, financing, institutional mechanisms and IEC strategies.

Valedictory Session

The workshop concluded with a valedictory session, where each group presented their findings and recommendations. The session also included closing remarks by Ms. Roopa Mishra, Joint Secretary, MoHUA, and Mr. Paulos Workneh, followed by a vote of thanks.

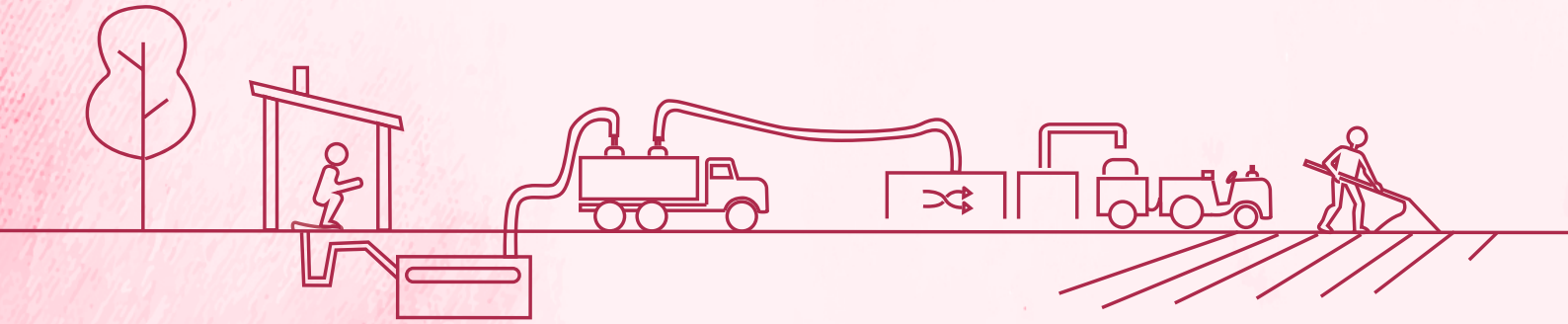
Conclusion

- Cities in the Global South are experiencing rapid growth, resulting in diverse physical typologies and significant disparities in income, housing and access to basic services.
- A one-size-fits-all approach to sanitation systems is not applicable either to entire cities or all states in India.
- A comprehensive conveyance and treatment system for domestic wastewater is preferable to partial systems like FSTPs or Interception and Diversion (I&D)-based nalla/stream treatment systems.
- A combination of different systems is necessary, considering specific constraints such as water availability, town finances, affordability and the aims of sanitation initiatives.
- Decision-making should be guided by the information technology (IT) sector's approach of working backwards from desired outcomes.
- Interception and diversion systems may be suitable for addressing river pollution, while septage management services could be provided in areas without sewerage infrastructure.
- The appropriateness of different combinations of wastewater treatment systems should not be determined solely through a formalistic analysis of centralized and decentralized systems.
- Long-term planning, spanning 20—30 years, is necessary for effective sanitation system planning at the state and city levels.
- Planning should include the expansion of both sewered and non-sewered, centralized and decentralized sanitation systems, as well as stormwater drainage.
- The central government bodies and support agencies should provide advisory support and guidance to improve interventions such as Faecal Sludge Treatment Plants, I&D systems, and centralized and decentralized Sewage Treatment Plants.
- Non-sewered sanitation systems are likely to remain in use for the next 20—30 years and improving their performance and effectiveness should be a key focus.
- Adopting a comprehensive and adaptable approach is crucial to addressing the diverse needs and constraints of growing cities in the Global South, leading to more equitable access to essential


NATIONAL CONSULTATIVE WORKSHOP
ON
USED WATER AND FAECAL SLUDGE
MANAGEMENT SYSTEMS


for every child

B STATE-LEVEL INTERVENTIONS



B 1: Strengthening Citywide Inclusive Sanitation (CWIS) and Faecal Sludge and Septage Management (FSSM) in Madhya Pradesh

Introduction

"Ab main bahar kyon jaoon, mere pass toh pakka latrine hai",[1] says Seema Bunkar, a middle-aged resident of Budhni town in the Madhya Pradesh state of India. An FSSM service chain assessor team supported by UNICEF visited the ward in which Seema's house is located in January 2022, and identified her house as one without a toilet. The Urban Administration Department sanctioned funds to build a toilet at her household and 35 other such households in nearby wards.

The first ODF+[2] (Open Defecation Free) and now Water C+[3] in the country is Indore in MP, which is invigorated and has a sense of pride at being the benchmark for other cities in the state. The State is now focusing on strengthening the FSSM service chain to achieve improved sanitation and public health outcomes. Madhya Pradesh has 407 Urban Local Bodies (ULBs) including 16 Municipal Corporations, 98 Municipal Councils and 292 Municipalities with a 21.2 million[4] urban population accounting for 27.6 per cent of the total population of the State.

Beneficiary Seema from Budhni, MP

[1]"Why would I go out now, I have got a permanent toilet."

[2]**ODF+:** Open Defecation Free Plus (ODF Plus) includes ODF sustainability, Solid and Liquid Waste Management (SLWM) and FSSM.

[3]**Water +:** A city can be declared as Water Plus provided, all wastewater released from households, commercial establishments etc. is treated to a satisfactory level before releasing the treated wastewater to the environment.

[4]Census 2011.

In 2020, to strengthen the planning and implementation of Faecal Sludge and Septage Management (FSSM) services as part of Citywide Inclusive Sanitation (CWIS), UNICEF and Bill and Melinda Gates Foundation (BMGF) partnered to support the Directorate, Urban Administration and Development (UADD) in Madhya Pradesh. This technical support contributed strategically to improving the FSSM Service Chain in the targeted Urban Local Bodies and replicating the key learnings to further strengthen FSSM interventions in the State.

The State Government accelerated investments in the sanitation service chain, including assessments and provisioning of individual household latrines (IHHL)/toilets, vacuum trucks for safe desludging and transportation of Faecal Sludge and Septage, construction of Faecal Sludge Treatment Plants (FSTPs) and Co-treatment modules for Sewage Treatment Plants. Currently, over **80 per cent of ULBs have procured** vacuum trucks/suction machines for mechanized cleaning and about 350 ULBs have constructed FSTPs.[5] For the bigger ULBs, the focus is on developing sewage networks and sewage treatment systems. About 113 cities are implementing sewage systems and are at various stages of construction with financial assistance under the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) and other funding sources including the World Bank, KfW Development Bank and Asian Development Bank (ADB).

Strategic Approach to Strengthen FSSM in Madhya Pradesh

The UNICEF-BMGF partnership took a strategic approach to FSSM ecosystem in the State, focusing on key building blocks pertaining to the enabling environment, demand, supply and quality of the services.

Setting-up FSSM Technical Support Unit (TSU)

The Directorate, Urban Administrative and Development (UADD) with support from UNICEF, established a Technical Support Unit (TSU), with expertise in strengthening the FSSM service chain, to draft strategies on Capacity Building and Social Behaviour Change Communication. The TSU provides guidance and assists the department in implementing a systematic approach to strengthen CWIS and FSSM in the State. The TSU, comprising FSSM and SBCC experts, works with the department and ULBs on developing a state-level policy and guidelines, planning and implementing capacity building, and strengthening monitoring systems and demand generation.

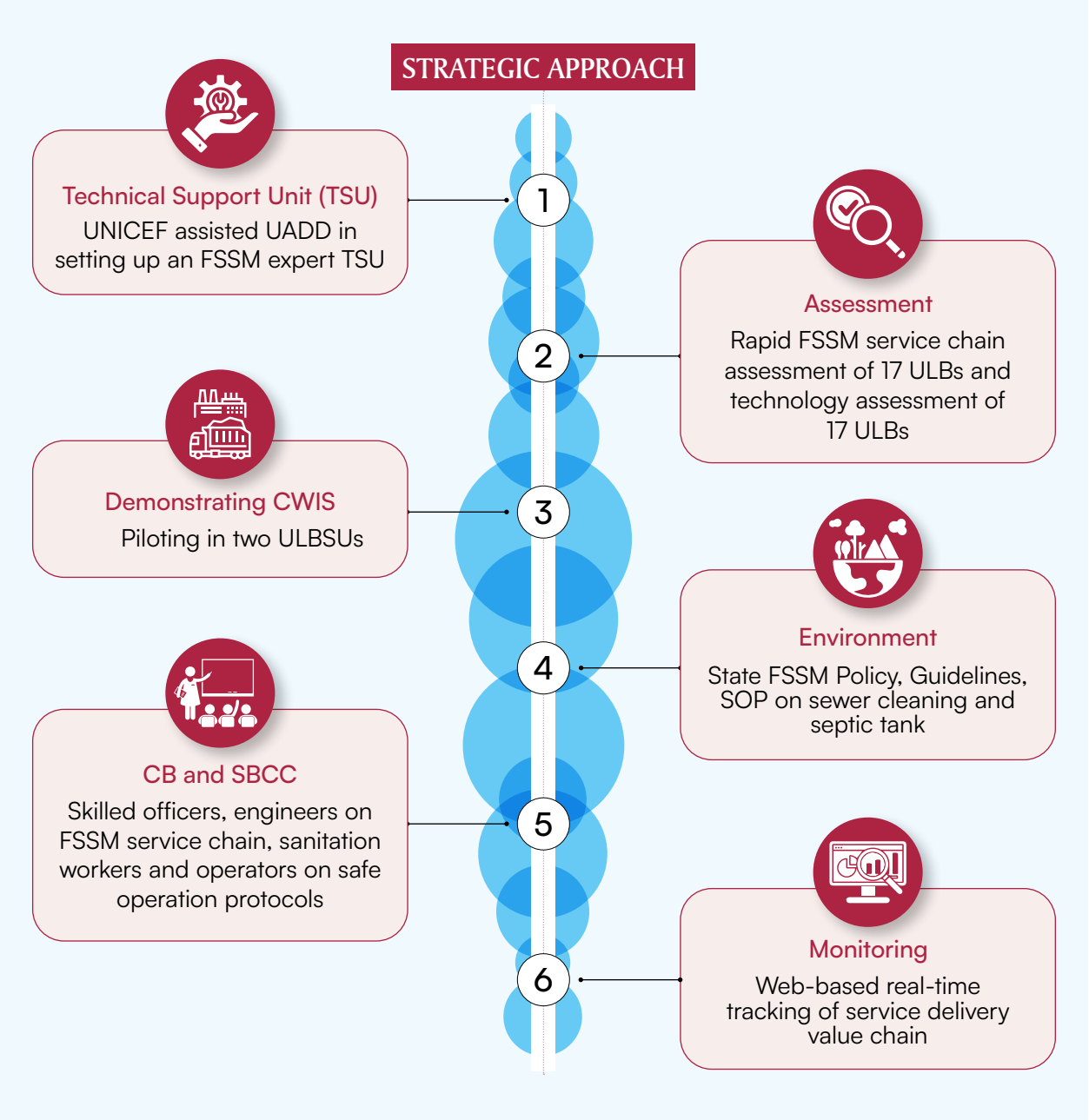
Comprehensive Assessment of FSSM in Select Cities and Support in Strengthening Treatment Technologies

A rapid assessment of the FSSM service chain for 17 ULBs from March 2021 to April 2021 and a comprehensive technical assessment of FSTPs in another 17 ULBs between January and February 2022 was carried out to help understand the gaps, challenges and practices of FSSM in the State.

Sanitation worker desludging

[5](source — UADD, Bhopal)

Figure 4. Strategy to strengthen FSSM in MP



Key findings of the assessment were:

- Most cities were non-sewered. Only 5 per cent of households had sewer connections.
- 50 per cent of the FSTPs were defunct or partially functional whereas the other 50 per cent operated at a low capacity without regular Operation and Maintenance (O&M).
- There was low functionality and compliance with discharge norms.
- Limited human resources with low or no capacity in the implementation and O&M of FSSM systems in ULBs affected performance.
- Smaller ULBs had adopted uniform technologies/designs irrespective of contextualized needs. These included Sludge Drying Bed (3) + Leachate Storage Tank (1) + Planted Drying Bed (1) + Clear Water Tank (1).

These findings helped the state in shaping strategic areas of interventions.

The exercise assessed the total required capacity for treatment in the state as 1.7 Million Litres Per Day (MLD) for 373 cities (with population less than 1,00,000) while the existing treatment capacity in 350 cities was 1.05 MLD (Currently 350 ULBs have existing FSTP).

The assessment findings were used for evidence-based advocacy to prioritize FSSM, focusing on the following critical components:

- Need for a comprehensive Citywide Inclusive Sanitation Plan, focusing on FSSM Value Chain in totality, and supporting the co-creation of workable models in two ULBs
- Strengthening of Social Behaviour Change Communication (SBCC) for communities and institutions for enhanced demand of FSSM.
- Capacity building of key ULB staff and stakeholders to ensure better skills and participation in overall management of service chain.
- FSTP design enhancement to increase treatment capacity, demonstrate upgradation and implement a retrofitting plan for existing FSTP in targeted ULBs.
- State-level support for policy advocacy, guidelines, standard operating procedures (SOPs) and designs for upgradation and budgeting.

Following the assessment, in the financial year 2021—22, the UADD allocated USD 1,255,045 (Rs. 10.34 Crore) for the construction of new FSTPs in 166 ULBs. The aim was to create new and additional capacity focusing on nature-based technology solutions to promote low-cost infrastructure and maintenance, addressing the need for a self-sufficient, sustainable, low-cost operating model. The State also demonstrated advanced technologies in some cities with higher population density, such as the radiation-based 100 TPD Sludge Hygienization plant in Indore city, 50 Kilo Litres Per Day (KLD) , Moving Bed Biofilm Reactor (MBBR) technology-based FSTP in Jabalpur, 50 KLD hyper-core technology-based FSTP in Ujjain, etc.

Handholding Support for Co-Creating Citywide Inclusive Sanitation (CWIS) in Pilot ULBs

UNICEF supports the piloting of Citywide Inclusive Sanitation (CWIS) in two ULBs (Pithampur and Budhni) with WaterAid India as the implementing partner on ground. Pithampur, in the Dhar district, is an industrial town with a significant share of floating population, while Budhni is an average tier-II town representative of the majority of other towns in the state. These two ULBs have a varied character and structure, as one ULB serves an industrial town with a population of more than 100,000, while the other is smaller, serving a population less than 50,000. A comprehensive baseline assessment was carried out on the status quo of the existing FSSM service chain. Elected representatives and ULB officials from both the ULBs were oriented on FSSM. Consultative workshops were also organized on developing CWIS plans.

As a result, 1,495 households in Budhni are now connected with Sewer Lines and 90 households have access to new toilets. More than 200 Septic Tanks are emptied in Pithampur. Meanwhile, the cities strengthened supportive supervision/tracking of operational standards for sludge transportation facilities and trained 53 sanitary workers and operators on safety procedures for improved service delivery with the help of UNICEF. Active participation of users was encouraged by building upon positive behaviour change experiences; outreach to 15,000 households; rolling out citywide communication campaigns including triggering sessions with the community; and mobilizing leadership in the community. In addition, formation and activation of Mohalla Samiti (Ward Committees) with support from women self-help groups for institutional strengthening and decentralized decision-making resulted in revamped demand generation. Based on the technical assessment, FSTPs have been augmented to accommodate the current FSSM requirement. An Operational Plan has been developed in Pithampur ULB for scheduled desludging in six wards. The ULB has also

rolled out a subsidized charge regimen for group desludging of septic tanks. Community-led demand generation has been streamlined by engaging Mohalla Samiti and SHG women members. A QR code-based demand generation system is also being piloted in Pithampur.

Key Learning from the Pilot

- Introduction of a pro-poor pricing mechanism to improve FSSM service coverage would further enhance demand.
- Adequate construction norms (as per IS 2470 Part I & II) for septic tanks should be included in building construction norms and approval processes.
- Alternate financial provisions (sanitation credit financing, CSR, 15th Finance Commission etc., should be explored to improve individual households' containment systems.

Creating an Enabling Environment at State Level for CWIS-FSSM

Madhya Pradesh State Used Water and Septage Management Policy (Manhole to Machine Hole) was adopted on 5 March 2024 by the Hon'ble Chief Minister.

This Policy strengthens the State's commitment to ending manual scavenging. "Manhole to Machine Hole" is focused on automation of the overall Used Water and Septage Management process, thereby substantially enhancing the safety of sanitation workers. Sanitation workers now do not need to use the old methods of handling septage or human excreta.

As the name suggests, the Policy builds robustly on the safety and dignity of SafaiMitras (Sanitation Workers). Their exposure to septic and sewer cleanings will be substantially reduced through use of mechanized equipment. Further, use of personal protective equipment, proper training, institutional arrangements, access to easy finances through loans and entrepreneurship development for sanitation workers are key aspects focused in the Policy.

The policy further intensifies the need of proper management of Faecal Sludge and Used water (wastewater) in urban settings by providing policy environment for enhanced institutional mechanisms, technologies, resources, roles and responsibilities of stakeholders and monitoring mechanisms. It strongly advocates for training and capacity building of the Urban Local Body team, sanitation workers and all stakeholders to ensure its realization. Community engagement

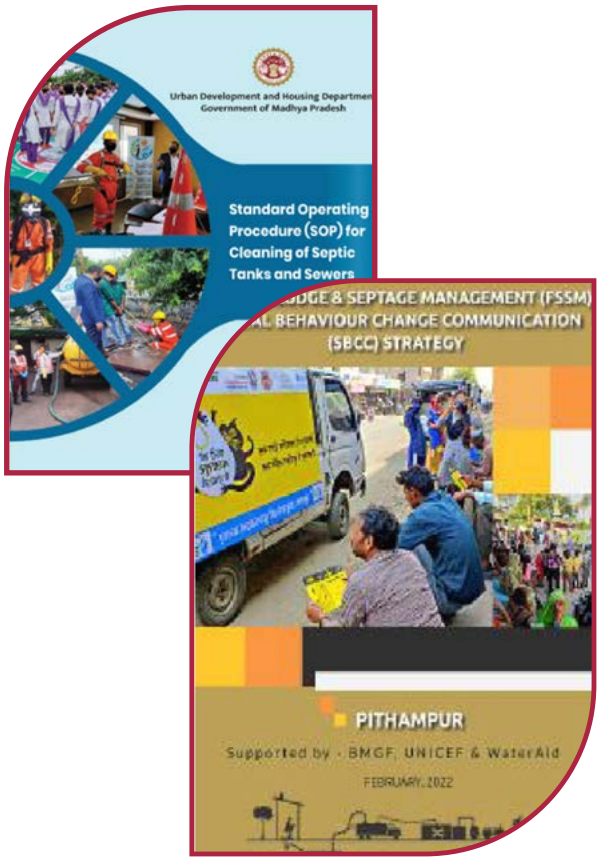
Launch of the State Used Water and Septage Management Policy by the Hon. Chief Minister Dr. Mohan Yadav on 5 March 2024

and public awareness for septage/used water management is highlighted as an essential component of cleanliness in urban areas. Climate resilient action such as maximum reuse of treated sludge as fertilizer in farmlands, parks, gardens and other such avenues are further focused in the policy. This leads to reduction in incidences of diseases due to safe and sustainable Used Water and FSSM services.

The next step is to develop and roll out operational guidelines for the policy and handholding of department and stakeholders.

The department has issued a Standard Operating Procedure for cleaning septic tanks and sewers to strengthen the safety of sanitary workers and streamline emptying protocols.

The State has established and institutionalized the Emergency Response Sanitation Unit (ERSU) in all districts that deploy two sewer entry professionals in each unit to respond in emergency situations and has also allocated USD 221,942 to streamline equipment and supplies.



SBCC Strategy for Pithampur

Social Behaviour Change Communication (SBCC) for Creating Effective Demand

Building on the inputs from the communication needs assessment, UNICEF is supporting the department to develop an FSSM behaviour change communication strategy. UNICEF has also helped to roll out statewide campaigns with outreach to one million people. Vernacular communication packages and materials have been developed addressing local needs and delivering key FSSM and hygiene messages to adopt scheduled desludging, handwashing with soap and appropriate norms to construct septic tanks through audio jingle bells, posters, wall paintings on dos and don'ts to construct septic tanks, etc. UNICEF is also supporting UADD in rolling out mass awareness campaigns on event days such as World Toilet Day, World Water Day and Global Handwashing Day.

SBCC campaign in Pithampur

Strengthening the FSSM Monitoring System

With the support of UNICEF, UADD has developed a web-based FSSM service chain tracker to monitor the operations of the sanitation service chain in ULBs. This is currently being tested in selected ULBs and is planned to be operational statewide, post training of officials and functionaries. The department also plans periodic evaluation of the ULBs on a sample basis to validate the inputs. An innovative QR code-based septic tank emptying request drop-in facility has been piloted in UNICEF-supported ULBs that aim to bridge the gap between demand and supply and improve service quality.

Empowering Sewer Entry Professionals with Safety Trainings on Cleaning of Sewers and Septic Tanks

As part of Citywide Inclusive sanitation (CWIS), UNICEF, along with BMGF, is extending Technical Assistance (TA) to the Government of Madhya Pradesh on effective Faecal Sludge and Septage Management (FSSM). The support includes strategic planning, capacity building of the technical and human resource base, and monitoring support to the state, through the Directorate of Urban Administration and Development (UADD).

Screenshot of FSSM monitoring dashboard

Way Forward and Scaling Up

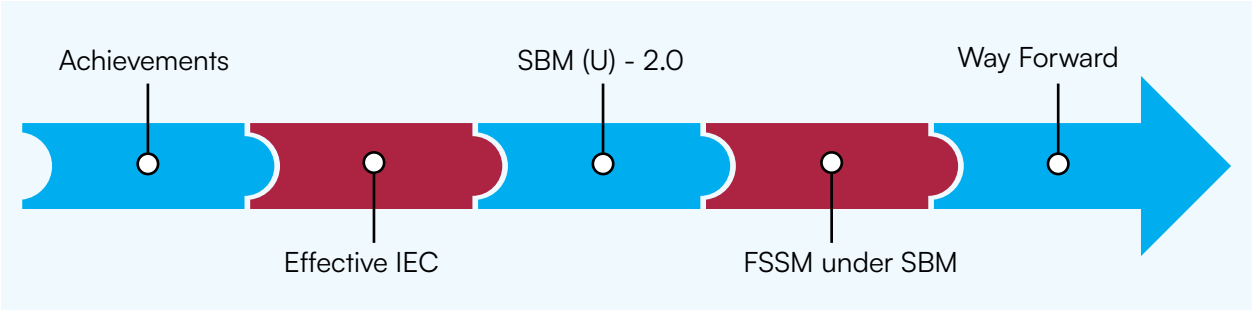
The UADD department is developing operational guidelines for the implementation of the Used Water and Septage Management Policy. UNICEF will help to create a repository of Knowledge Management products such as process documents, A/V materials, and CB and SBCC packages developed under the support. This will be shared with stakeholders from other ULBs across the state. Alongside this, a policy on urban-rural convergence on FSSM is under development.

Classroom session on the use of safety equipments

B 2: Pioneering Sanitation Strategies: Chhattisgarh's Urban Sanitation Journey and Future Perspectives

Introduction

Chhattisgarh has been lauded for adopting an effective mix of mass media, mid-media and interpersonal communication channels to drive the state's sanitation revolution under the Swachh Bharat Mission (SBM). This article highlights the best practices followed by Chhattisgarh under SBM



Achievements

The state of Chhattisgarh has emerged as a shining example of the successful implementation of SBM in urban areas by employing strategic and innovative information, education and communication (IEC) initiatives. Urban Chhattisgarh has witnessed a sanitation revolution with the active participation of various stakeholders including the community, private sector and citizens for making SBM a people's movement.

Chhattisgarh adopted a mix of three communication channels, namely:

- Mass communication
- Mid-communication
- Interpersonal communication

The achievements accomplished by Chhattisgarh in urban sanitation bears testimony to the successful IEC strategies implemented in the state with the aim of maximizing awareness and triggering people to adopt behavioural changes.

Successful Outcomes

The State was duly recognized for the successful implementation of SBC (U) campaign in the State. It won the following awards:

- Achieved ODF and ODF++ certification.

- Ranked third best-performing state in Swachh Survekshan 2018.
- Ranked the best-performing state in Swachh Survekshan 2019, 2020 and 2021.
- Received UN 3R Forum Award and Swachhta Excellence Award.
- Won HUDCO Award for Innovative IEC.

IEC Activities Enabling Infrastructure, Institutional and Behavioural Change

The annual survey of cleanliness carried out by the Ministry of Housing and Urban Affairs (MoHUA) has applauded the IEC initiatives by the Government of Chhattisgarh on multiple counts. Given below is a list of IEC and social and behaviour change communication (SBCC) initiatives and strategies that helped the State win numerous accolades for the effective and efficient implementation of SBM (U):

- Involvement of PIUs , non-governmental organizations (NGOs), sanitation workers, clubs, self-help groups (SHGs) in the door-to-door campaign and implementation.
- Consistent rollout of IEC/SBCC initiatives across 166 urban local bodies (ULBs).
- Incorporation of feedback at various levels.
- Youth-oriented activities like thematic drives, competitions, comics, stickers and clubs.
- Prioritization of interpersonal communication tools.
- Memoranda of understanding (MoUs) with industries for scientific plastic waste disposal.
- Convergence with Pradhan Mantri Awas Yojana (PMAY) and competitions among State Rural Livelihood Mission (SRLM) centres.
- Effective utilization of mass media, outdoor media and social media.

Chhattisgarh and SBM (U) 2.0

SBM (U) 2.0 in the state focuses on a new component — Used Water Management. Having performed exceedingly well during the implementation of the first phase of the SBM, Chhattisgarh now focuses on ensuring that no untreated used water is discharged into open lands and water bodies and a significant amount of treated wastewater is reused.

Sanitation workers training

The SBM (U) in Chhattisgarh carries three major objectives: (a) Achieving 100 per cent Open Defecation Free (ODF) status; (b) behaviour change through 'Jan Andolan' and (c) ensuring 100 per cent scientific solid waste management (SWM). The state has performed exceptionally well in the implementation and accomplishment of the first two objectives through its numerous IEC/SBCC initiatives. However, it is yet to achieve 100 per cent scientific SWM.

Guidelines on Sustainable Treatment of Used Water

The imperative of addressing urban wastewater and sanitation in India need not be overstressed. The state of our contaminated groundwater, surface water and water bodies and the ever-increasing need for clean water in our towns and cities call for urgent measures towards efficient water management. We may run out of clean water unless there is a concerted effort and a governance mandate to reduce the generation of wastewater. Hence, the role of SBM (U) 2.0 (2021—2026) becomes crucial, with the following areas of focus:

- Holistic sanitation solutions from discharge to safe disposal.
- Treatment of used water before discharge into water bodies.
- Reuse of treated used water.
- Eradicating hazardous sewer/septic tank entry and sustaining manual scavenging elimination.
- Awareness creation and citizen outreach.
- Building institutional capacity.

Recommendations

- Understand different modes of waste/used water treatment (STP, FSTP, STP-cum-FSTP).
- Adopt decentralized and networked sanitation systems complementing centralized systems.
- Avoid high CapEx investments in massive sewerage networks in small/medium towns.
- Explore co-treatment of septage with sewage in STP-cum-FSTPs.

New Area of Interest – FSSM in Chhattisgarh

The Chhattisgarh Urban Faecal Sludge (FS) Used Water Treatment Quality Analysis Plan marks a significant milestone in the state's endeavour to enhance public health and environmental sustainability. Rooted in SBM initiated in 2014, which aimed to eradicate open defecation and improve solid waste management, this quality monitoring plan represents a crucial step in the state's efforts to achieve the Sustainable Development Goals (SDGs).

Institutional Framework

The State Urban Development Agency (SUDA) and Mission Directorate (SBM-U) are vested with the overall responsibility of establishing state laboratories or collaborating with accredited labs for used water and faecal sludge testing.

Other Key Institutional Roles

State Pollution Control Board

- Coordinate with ULBs on monitoring activities.
- Enforce standards.

Urban Local Bodies

- Ensure regular testing as per protocols.
- Train and certify STP/FSTP operators.
- Retrofit/upgrade treatment systems based on test results.

Academic/Research Institutes

- Provide research and technical expertise.
- Assess effectiveness of monitoring programmes.

STP/FSTP Operators

- Collect and test samples as per standard operation procedures (SOPs).
- Maintain testing logs.

Engineers/Municipal Commissioners

- Prepare monitoring plans.
- Ensure compliance and take corrective actions.
- Allocate funds for regular monitoring.

STP and FSTP: A Comparative Analysis

- Small/medium towns may not generate enough wastewater for conventional STPs.
- Minimum wastewater strength may be inadequate for STP operation in high rainfall/ good groundwater areas.
- Septic tanks predominate over sewered connections in Chhattisgarh's sanitation landscape.
- One STP per town approach may create dead capital expenditure.
- Centralized sewerage networks need massive investments and are very expensive to build, operate and maintain.
- No large or small town in India has 100 per cent networked sewerage connectivity.
- Decentralized STP-cum-FSTP and non-sewered systems are emerging as urban sanitation solutions.
- Co-treatment of septage with sewage in STP-cum-FSTPs can address faecal sludge challenge.

Recommendations

Chhattisgarh has been hailed as one of the lighthouse States of SBM(U) to encourage and promote peer learning and knowledge sharing as part of the Mission's capacity-building initiatives. Thus, Chhattisgarh must work as a flagbearer in sustaining its efforts and implementing the models that work best for the state. The area of foremost consideration for the state currently is the understanding of different modes of waste/ used water treatment through the setting-up of STPs or FSTPs or STP-cum-FSTP. Sewage is treated in STP, and faecal sludge can be treated either at STP, STP-cum-FSTP or standalone FSTP. Further, the treatment may be centralized or decentralized. Sewage treatment plants (STP) are used primarily for the treatment of used water coming out from domestic areas, commercial establishments and institutions. Faecal septage treatment plants (FSTPs) are used for the treatment of faecal septage being periodically removed from septic tanks of domestic, commercial establishments and institutions to maintain their efficient removal of faecal sludge.

Sanitation workers

B 3: Assam: A Journey towards FSSM Coverage

Major Milestones Achieved

July 2021 — Sep 2021

Selected Goalpara and Nagaon district as the focused town/Urban Local Bodies (ULB) for piloting Faecal Sludge Treatment Plants (FSTPs) in consultation with Secretary, Department of Housing and Urban Affairs (DoHUA)

Oct 2021 — Dec 2021

Established partnership with the Women Development Centre (WDC) for community mobilization and social behaviour change activities.

Faecal Sludge and Septage Management (FSSM) policy prepared and shared with DoHUA

Jan 2022 — Mar 2022

Completed Baseline Survey and analysed the Baseline FSSM situation.

Orientation trainings conducted for the key stakeholders in the state

Apr 2022 — June 2022

Prepared State and Disctirct-level SBCC strategy and plans. Institutionalized training with State Institute for Panchayat Raj and Rural Development, (SIPRD); 18 Master trainers trained and engaged.

Standard Operating Procedures (SoPs) and FSSM bylaws drafted and shared with DoHUA and ULBs.

July 2022 — Sep 2022

Funds alloted from 15th FC for 32 FSTPs -- more than Rs. 38 crore.

Land identified for 32 FSTPs.

Two FSTPs functional; construction work started in 11 out of 32 FSTPs; tendering and detailed project report (DPR) preparation in progress for other FSTPs.

Oct 2022 — Dec 2022

Deep row entrenchment (DRE) was used for treatment in Goalpara until the FSTP construction work started but discontinued in December due to Court case.

Jan 2023 — March 2023

IEC activities and meetings conducted to convince Ward members in five pilot ULBs; Construction of FSTP resumed after winning a court case in Goalpara. Preparation for Tendering process started for 32 ULBs .

April 2023 — June 2023

Training sessions conducted for SHG, National Service Scheme (NSS) volunteers. A New Coordinator joined for monitoring the work of FSTPs in pilot ULBs. Training on tendering done for 32 ULBs.

July 2023 — Sep 2023

School and college students oriented. NSS volunteers trained. SHGs trained on FSSM. presently 11 FSTPs are under construction.

Training of trainers on safety and dignity of sanitation workers.

Jan 2024 — present 2024

Inauguration of 3rd FSTP in Tinsukia with the capacity of 20 KLD.

20 FSTPs under construction.

Trained 1,227 sanitation workers on safety and dignity.

Oct 2023 — Dec 2023

Intensive IEC and SBCC activity on World Toilet Day, reached more than 50,000 people with FSSM messages

The FSSM Challenge in Assam: Getting Funds for FSTP and Scaling Up Needs Leadership

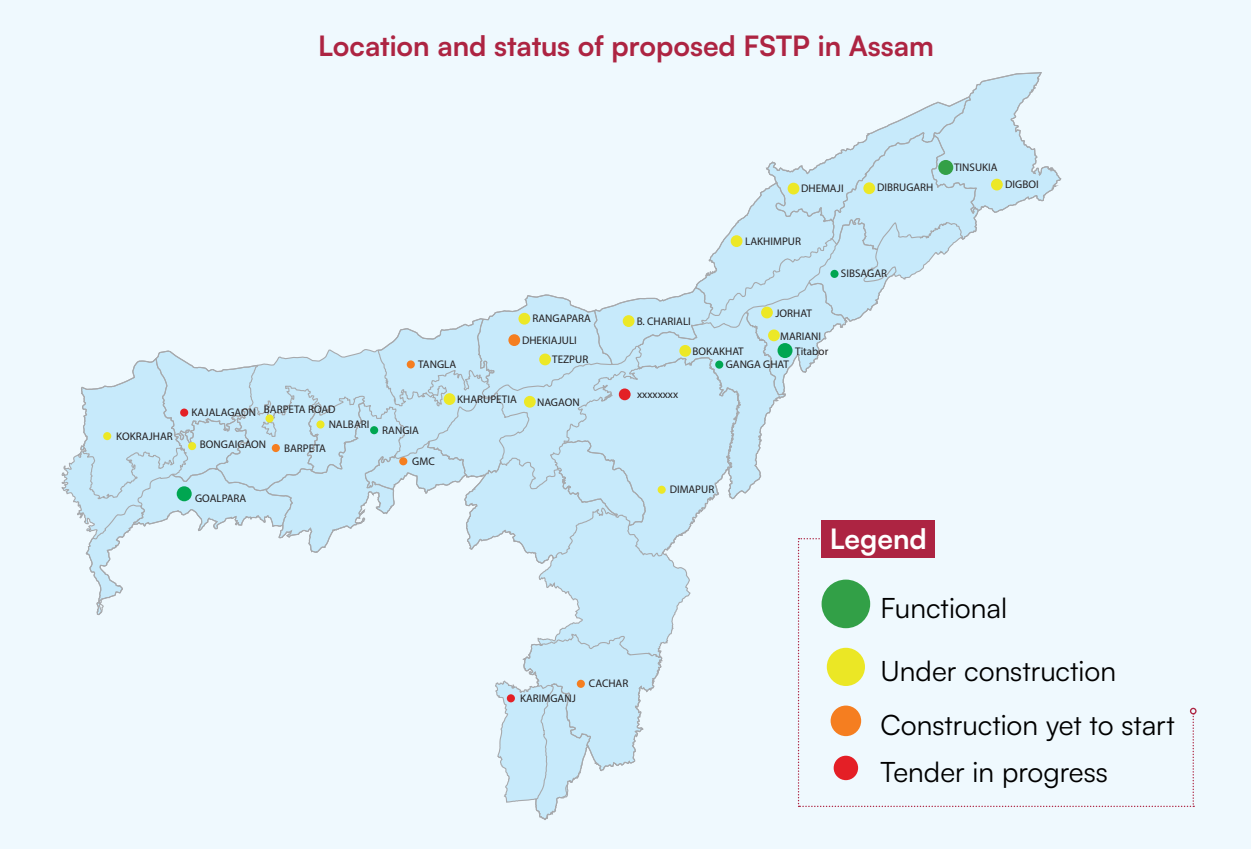
The Swachh Bharat (Clean India) Mission ensured access to at least basic sanitation and helped households construct individual toilets during its first phase, 2014—2019. The increase in toilet usage led to an urgent need for Faecal Sludge and Septage Management (FSSM). Until September 2022, Assam did not have any Faecal Sludge Treatment Plant (FSTP) or Sewerage Treatment Plant (STP) to treat or scientifically dispose of faecal sludge. To address the issue, UNICEF introduced FSSM in July 2021, and the Government of Assam, in collaboration with UNICEF, piloted FSSM models in Nagaon and Goalpara districts.

After a Technical Support Unit (TSU) was set up in July 2021, the Swachh Bharat Mission (SBM — Urban reported that the State was Open Defecation Free (ODF). The Department of Housing and Urban Affairs (DoHUA) suggested that Goalpara and Nagaon ULBs were chosen as pilot FSSM districts because they were pulled up by the National Green Tribunal (NGT) for the pollution of rivers and were closer to Guwahati. Work started in full swing to introduce FSSM despite lack of knowledge on FSSM and FSTPs as FSSM was not yet practised in the state.

By September 2022, one of the Urban Local Bodies (ULBs), Titabar Municipal Board (MB), constructed the State's first FSTP based on the Moving Bed Biofilm Reactor (MBBR) + Sludge Drying Bed (SDB) technology in a cost-effective manner. The FSTP construction work started in Goalpara but had to be stopped temporarily for two months due to public protest owing to misconceptions but was resumed later. In Nagaon, there were difficulties in identifying the land for FSSM, which led to a delay in starting construction and getting funds.

The 32 ULBs now chosen for FSTPs cover almost all districts of Assam from upper, central, western and lower Assam.

Location and status of proposed FSTPs in 32 ULBs covering 23 out of 35 districts



Dual Challenge for FSTP Movement in Assam

FSSM as a new subject with no local model

- Subject was new and there were no models to be seen and adopted within the state.

Funds availability

- No funds available or allotted for FSTP by government in their schemes except for the AMRUT cities and only as co-treatment in the SBMU 2.0 guidelines.

FSSM in Assam was challenging as it was new to the State. Funds were made available, which helped the State move from unsafe faecal disposal to three ULBs adopting safe faecal sludge management. And 29 other ULBs are now working to set up FSTPs, which when functional will help the state achieve an FSTP capacity of 352 KLD by 2023—24. This strategy could be a viable pathway for rapidly scaling up FSSM services in Assam.

This case study highlights how the leadership provided by the Commissioner and Secretary, Department of Housing and Urban Affairs (DoHUA), Ms Kavitha Padmanabhan IAS, and the Directorate of Municipal Administration and SBM(U) gave the much-needed thrust to FSM, which had become urgent for mitigating pollution and abiding by NGT directives.

The FSSM project in Assam with the Support of UNICEF and BMGF

UNICEF, in partnership with the Bill and Melinda Gates Foundation (BMGF); initiated the project in March 2021 by adopting the following approach:

UNICEF's FSSM Planning and Objectives for Assam

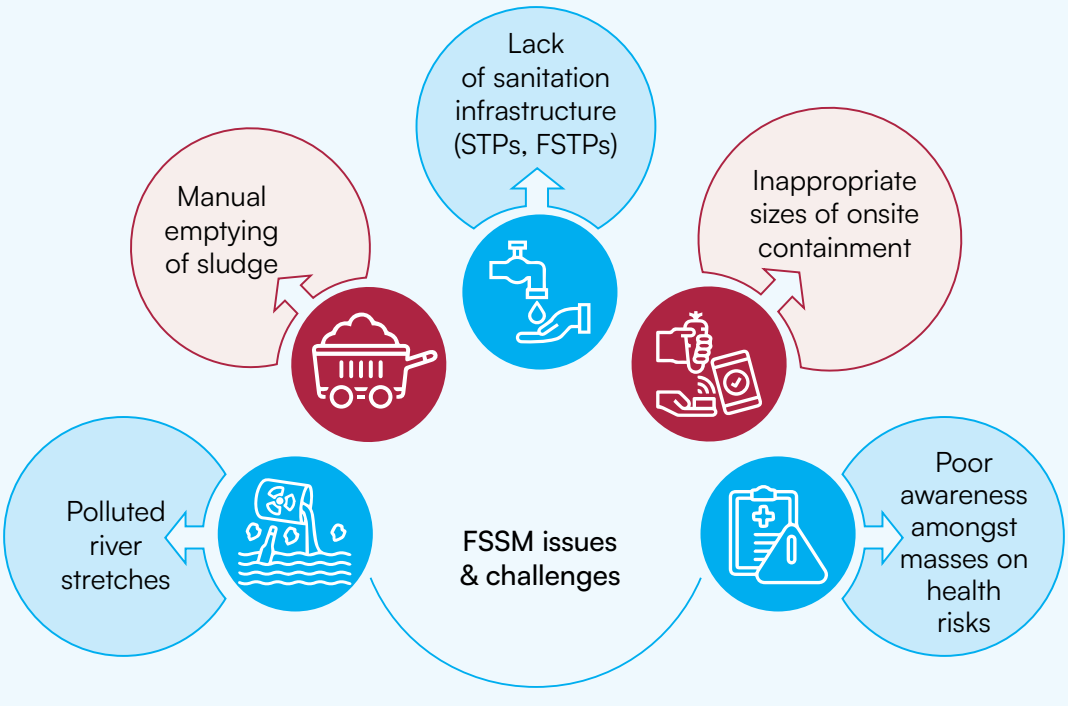
- Developing a state-level Technical Support Unit (TSU) to disseminate knowledge and handhold support for creating models for replication.
- Institutional strengthening.
- Planning, treatment and management of faecal sludge.
- Roll out of SBCC (Social and Behaviour Change Communication) and IEC (Information, Education and Communication).
- State scale up through coordination, improved monitoring systems and evidence-based engagement with stakeholders.
- Identifying and strengthening of innovative models.
- Support scaling up FSSM across the state.

Assam: Before the Initiative

In Assam, there is a gap of approximately 435 million litres per day (MLD) in sewage generation and treatment as per the filing with the NGT. Implementation of onsite sanitation services remains a problematic area in all the cities in the FSSM value chain. The challenges faced are shown in the figure below.

- Data related to the availability of sanitation services and collection of faecal sewage and sewage treatment was not collected or not known in most urban bodies.
- Inappropriate tank sizes are another problem that occurs due to lack of defined norms with regard to tank sizes.
- Other problems were lack of FSTP or STP infrastructure in any of the municipal bodies for faecal sludge treatment, poor awareness among people on how untreated faecal sewage poses health risks and more than 40 polluted river stretches identified by the Central Pollution Control Board (CPCB).
- Overall, the State did not have any FSSM policy, strategy, bylaws nor any standards maintained for the safe disposal of faecal sludge including scheduled desludging.

IEC collaterals

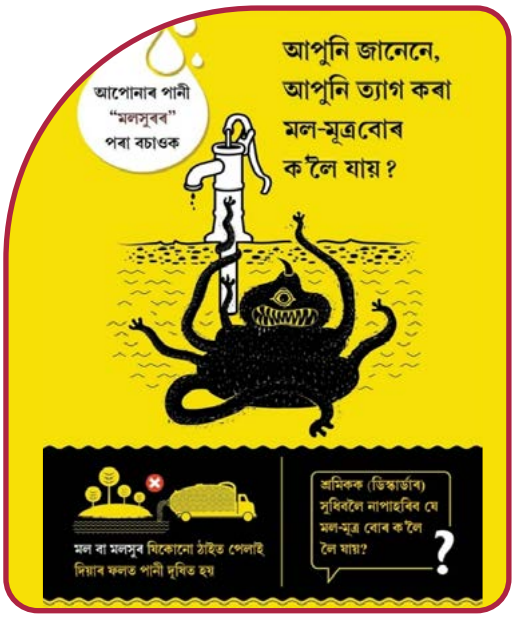


Scaling Up Strategies

UNICEF, in collaboration with DoHUA and the Government of Assam, developed a multi-fold approach for scaling up the FSSM strategy for the State involving all key stakeholders as given below.

Milestones in the FSSM Journey

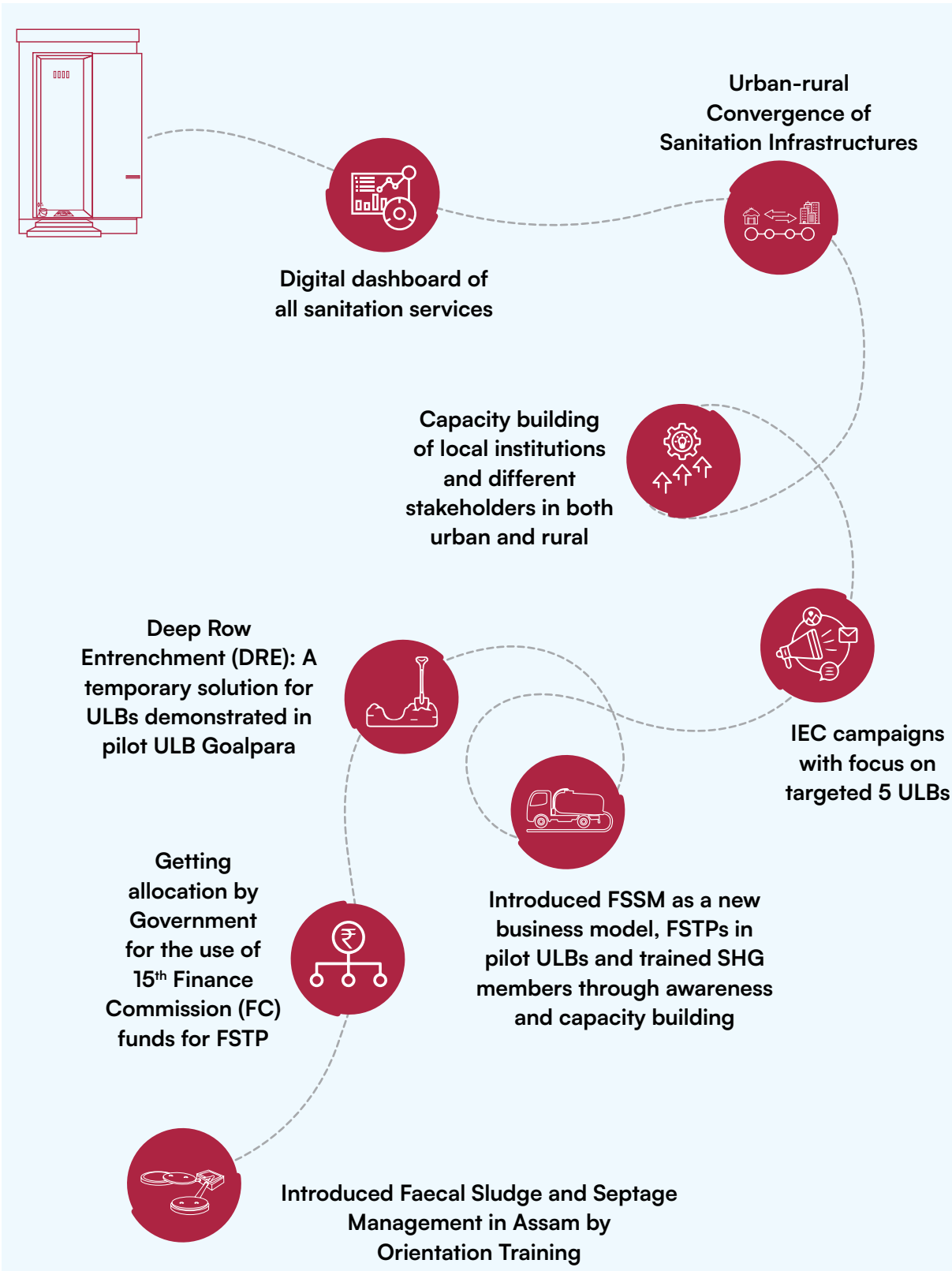
The milestones achieved in the State's FSSM journey demonstrates the state-level leadership and the contribution of UNICEF to the strategy to mitigate pollution and damage to the environment through the disposal of untreated faecal sludge.



Poster made on Malasur

- State-level Advocacy
- System Strengthening and Policy Development
- Rapid Assessment
- Pilot Demonstration in Focused ULBs
- Capacity Building for the State Key Functionaries
- Statewide IEC/SBC Campaign
- Partnership with Key Government Departments and Engagement with Multiple ULBs
- Urban-rural Convergence to Ensure Effective Utilization of Resources
- Strengthening Convergence between Key Departments (DoHUA, SIPRD, ASDMA, Health, Education, PHED, DWCD, TTWD, BTR)
- Planning for Appropriate FSSM Technology and Knowledge Dissemination
- Monitoring and Knowledge Management
- Getting Fund Allocations for FSTP
- Technical Support to ULBs After They Decided to Construct FSTPs

The FSSM Journey: Milestones



UNICEF and TSU-FSSM meeting with Secretary and Commissioner, DoHUA on FSTPs

The DoHUA decided to use 15th Finance Commission (FC) Tied Funds for setting-up model FSTPs. Goalpara Municipal Board (MB) was shortlisted for fund allocation as it was chosen as a pilot ULB and had already initiated the process for setting up an FSTP.

In view of NGT compliance requirements, the State Government reconsidered the process and plans for setting up the FSTPs. Funds allotted from the 15th FC tied grants were to be utilized for installing FSTPs and all ULBs started the planning process for FSTPs. The proposal and estimates were prepared and technologies finalized by the 32 ULBs. In a year's time, all ULBs are expected to complete the construction of FSTPs.

Link for Initiative of Government Leaders Published Online

https://nfssmalliance.org/from-open-defecation-free-to-safe-human-waste-management-the-journey-santa-karki-chetri-led-in-goalpara-assam/

Introduction of FSSM as a New Business Model for the SHG Members and Urban Local Bodies

The State Government, with the support of TSU, is integrating its efforts to empower self-help groups (SHGs) established under the National Urban Livelihood Mission (NULM) to move

The FSSM Funding Options

Expansion of AMRUT funding for FSSM	▶ AMRUT cities are planning to utilize AMRUT funds for FSSM.
15th FC Funds	▶ Titabar MB, Goalpara MB and Tinsukia MB constructed 10, 7 and 20 KLD FSTP using 15th Finance Commission fund. all 3 plants are operational now

the FSSM agenda forward at the household and community level and to create a sense of community ownership.

Often the realization in the field was that the concept of FSSM was absolutely new to both the State and at the grassroots level. It was realized that only by involving the SHGs the message will reach every household. Only then, each family will reflect on how to manage faecal sludge generated in septic tanks. The collaborative approach to citizen engagement is the key to facilitating successful behavioural change to motivate households to adopt good FSSM practices.

To understand the mindset and response from self-help groups regarding the FSSM, UNICEF, in collaboration with the Women Development Centre (WDC), conducted baseline surveys and engaged in IEC initiatives for SHGs. District-level orientations were held for the SHG and Area-Level Federation (ALF) members in convergence with Deendayal Antyodaya Yojana — National Urban Livelihoods Mission (DAY NULM). A group of selected SHG members were oriented and trained on FSSM, its value chain, benefits of the new FSTP and probable emerging business models with which they can involve themselves. Through these trained SHG members, the WDC carried out orientation training for other SHG members in different wards of the ULB. Till date, 3,300+ SHG and ALF members have been trained in Goalpara and Nagaon districts.

Meeting with District Collector, Goalpara and other stakeholders

SHG leaders learning about FSSM

Bharati Das and Kalpana Das constructed septic tanks in their home after attending the FSSM training

Initiatives of SHG Member Published Online:

https://nfssmalliance.org/flush-out-the-misconceptions-minas-journey-in-demystifying-fssm-for-her-community/

Deep Row Entrenchment (DRE): A Temporary Solution for ULBs

In the pilot projects where the FSTP was planned, it was proposed to start Deep Row Entrenchment (DRE) as a temporary solution for the safe disposal and management of faecal sludge. For towns with available land and in need of a way for temporary disposal of faecal sludge, DRE proved to be a viable solution. Currently, Goalpara town has a functioning DRE site with several other towns in the process of adopting DRE as an interim measure before constructing FSTPs. Prior to the implementation of DRE in Assam, no interim solutions were used for safe disposal of faecal waste. Indiscriminate disposal of faecal waste was done in agricultural fields, open places and water bodies or near plastic waste dumping sites, which led to an alarming contamination of the environment, posing a health hazard for people in the vicinity of these disposal sites. The FSSM expert of TSU provided technical assistance for carrying out DRE.

To successfully implement DRE as a solution in the state, as a first step, the total faecal waste generated by all towns and cities was estimated and the cost of implementation and upkeep were calculated. Then guidelines were developed for site selection and model designs for DREs were shared with the ULB officials. The Goalpara Municipal Board was keen and took up measures to immediately install DRE and also monitoring mechanisms were put in place to ensure that all the collected faecal waste is disposed at the designated DRE sites.

Capacity Building of Local Institutions and Different Stakeholders

The Government of Assam with support from UNICEF identified different stakeholders for FSSM and developed a capacity-building plan for the State. The plan was rolled out in collaboration with local Institutions like State Institute of Panchayats and Rural Development (SIPRD), which acted as a nodal training institute for FSSM in Assam for scaling up FSSM through rural—urban convergence mode. UNICEF Assam also established a partnership with WDC and built up the NGO capacity for providing support for FSSM in Goalpara and Nagaon towns.

Deep row entrenchment

State-level capacity building programme on FSSM

Training of Trainers (ToT), SIPRD

Initially, UNICEF, in collaboration with Water, Sanitation and Hygiene (WASH) Institute organized a capacity-building programme for the local institution (SIPRD), local NGO (WDC) and selected trainers. Through these local institutions, NGOs and trainers, the programme was extended to all the towns, reaching a large number of government officials from 104 ULBs and other departments directly or indirectly. More than 5,000 ULB officials, elected members, sanitation workers and masons were trained on FSSM.

IEC Campaigns in Pilot ULBs

The significance of communication campaigns in generating demand for sanitation services cannot be overstated. IEC campaigns were conducted in Goalpara to increase awareness on the risks of poor FSSM and manual disposal of faecal sludge in pits to increase the demand for mechanized desludging and to motivate households to desludge their septic tanks/pits every three years using mechanized emptying services. The Malasur campaign was used widely.

The IEC campaign was conducted for a period of one year using a mix of communication channels such as street plays, wall paintings and display of hoardings and dissemination of leaflets. The impact of the campaign resulted in the request for cesspool cleaning from households. Many households constructed septic tanks as per standards and desludging trucks also saw an increase in the number of trips per day.

FSSM TSU and SBM Team have prepared IEC material consisting of leaflets, posters, hoardings, wall paintings, community/public toilet (CT/PT) branding, writing scripts, cesspool truck branding, street play scripts and messages for radio jingles based on the key messages keeping in mind the local context of Assam. These materials have been prepared in both English and Assamese.

IEC campaign done by students

Present Status

- As of November 2022, many districts planned FSSM pilots projects in their ULBs. A state-level FSSM policy was prepared and submitted to the Government of Assam for cabinet approval. The state also established two of the lighthouse urban pilots on FSSM in smaller towns (Nagaon and Goalpara).
- As of now state government has constructed two FSTPs using Moving Bed Biofilm Reactor (MBBR) + Sludge Drying Bed (SDB) technology and one using Tiger Bio-filter, and 29 FSTPs are in progress in 29 ULBs using different technology options like Tiger biofilter (Vermi-Technology), Geo-Tube, Hybrid MBBR (mechanized screw press), MBBR and Decentralized Wastewater Treatment System (DEWATS).
- DoHUA has constituted a core committee for deliberating on FSSM policy, strategy, monitoring and quality assurance of FSSM projects. The committee consists of representatives from Municipal Administration, Sewerage Board, Disaster Management, Pollution Control Board (PCB), Town & Country Planning and WASH Specialist (UNICEF).

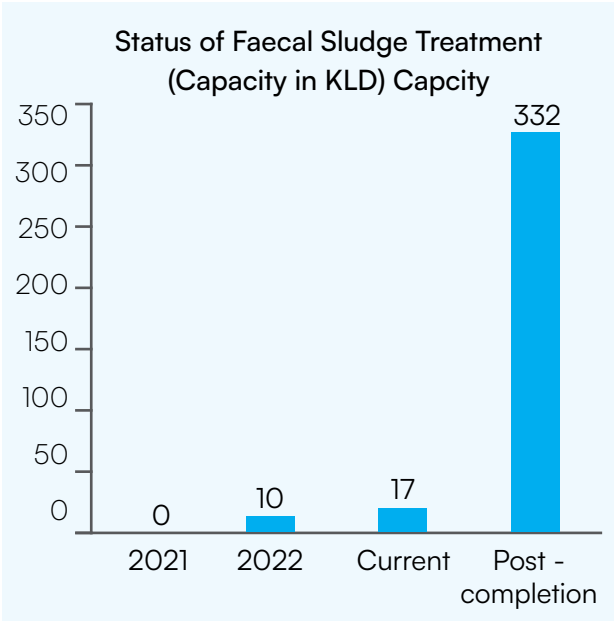
- Urban—rural convergence was initiated by the State Government and currently Titabar and Goalpara ULBs are engaged in such convergence for the maximum utilization of sanitation services. In the coming month, a memorandum of understanding (MoU) is going to be signed with the SBM(U) and SBM(G) for urban—rural convergence.
- FSSM Bylaws were prepared by the UNICEF-supported TSU and submitted to the Directorate of Municipal Administration for review and approval. After the approval from the State Government, ULBs have to adopt these Bylaws with changes in financial aspects accordingly.

▶ Following the success of FSSM in two pilot ULBs, the State Government is planning to scale up FSSM to all its 104 ULBs.

FSTP Of Goalpara based on TBF

FSTP of Tinsukia on MBBR

Assam's first FSTP at Titabar Town



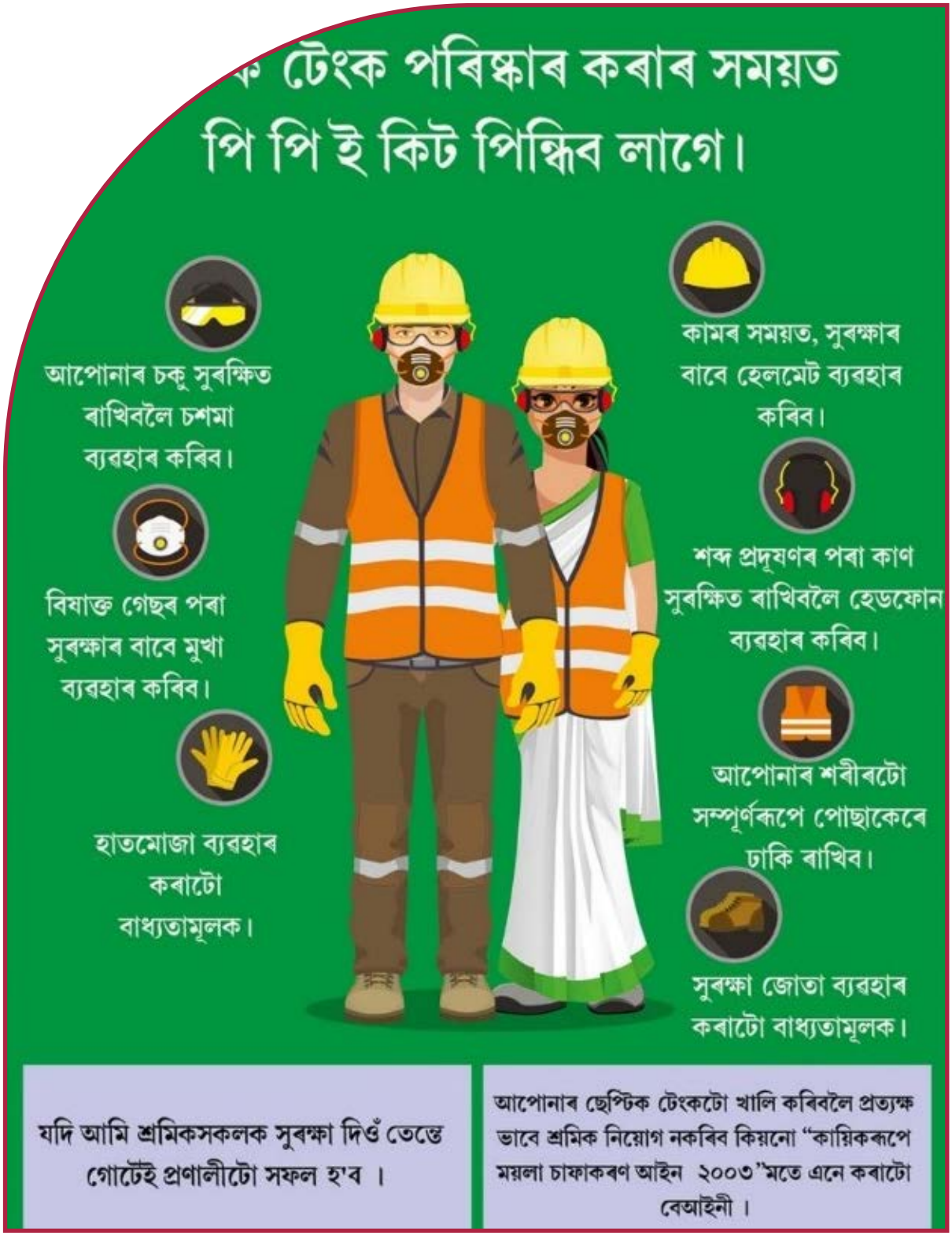
Current and Future FSTP Treatment Capacity for the ULBs

The above graph shows that when TSU was set up in July 2021, the safe disposal was at zero level. In September 2022, it rose to 10 KLD, and in 2023, it touched 17 KLD. Presently, the capacity has increased to 37 KLD with the installation of FSTPs at Titabar, Goalpara and Tinsukia. On completion of the 32 FSTPs by 2024, Assam will have the capacity to safely dispose of 352 KLD of faecal sludge.

Way Forward

The Assam Government made a timely decision, giving importance to FSSM as an important part of sanitation and used water management. Further, funds were ear-marked for FSSM. This proved to be a big step towards preventing environmental pollution and improving public health.

Assam, as a role model, has shown the way to states that are struggling to find ways for the mitigation of pollution through managing the sanitation value chain. The fruitful results of Assam Government's actions through DoHUA would be visible in two years' time when a significant reduction in pollution and its impact on health of the citizens of urban Assam is expected to be visible.

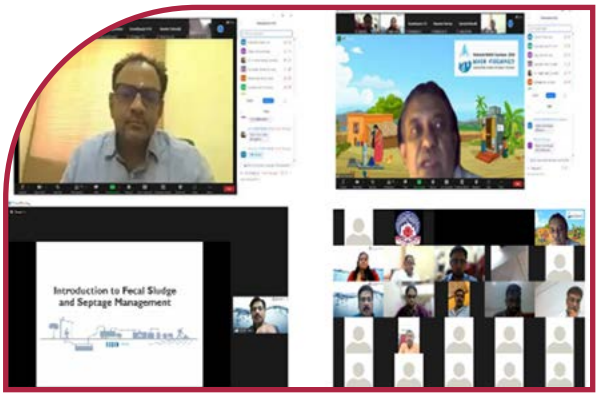


IEC poster related to sanitation workers safety

B 4: Chhattisgarh: Empowering Engineers for Safely Managed Sanitation

Introduction

Chhattisgarh, a state in central India, has emerged as a leader in Faecal Sludge and Septage Management (FSSM), demonstrating a strong commitment to improving urban sanitation and public health. A key factor in this success has been the state's focus on empowering engineers with the knowledge and skills necessary for effective FSSM implementation. This success story highlights Chhattisgarh's innovative approach to engineer training and its positive impact on the state's sanitation landscape.



Online capacity building session

Inspired by the dream of Swachh Bharat, articulated by the Hon'ble Prime Minister, Shri Narendra Modi, on 15 August 2014, the Government of Chhattisgarh declared Urban Chhattisgarh Open Defecation Free (ODF) in 2017. The Mission has been instrumental in achieving key milestones of success in Chhattisgarh's sanitation journey by enabling cities to achieve an Open Defecation Free status centred on the construction and provisioning of key sanitation infrastructure to all sections of society, creating entrepreneurial opportunities across the sanitation value chain, promoting a dignified perspective and measures of inclusion for the sanitation workers while also driving a mass behaviour change campaign — a Jan Andolan among the masses to take ownership of the cleanliness of their surroundings.

Desludging activity done in Chhattisgarh

Under the UNICEF—Bill and Melinda Gates Foundation (BMGF) project, technical support is provided to the State of Chhattisgarh and it is implementing agencies/partners by advocating for and supporting the initiatives of scaling up FSSM interventions through setting up of a Technical Support Unit (TSU) at Urban Administration and Development Department (UADD). It is with this imperative that UNICEF has conceptualized a State Capacity Building and Training Plan with a focus on Swachh Bharat Mission (Urban) 2.0 — FSSM components.

State Capacity Building and Training Plan

The State Capacity Building and Training Plan was developed with the following objectives:

- To develop robust institutional mechanisms for regular capacity enhancement of stakeholders involved in FSSM to achieve SBM-U 2.0 goals.

- To train NGOs, voluntary organizations and educational institutes towards achieving FSSM objectives.
- To train stakeholders on crafting inclusive, gender-transformative FSSM interventions.
- To develop leadership abilities and technical skills of professionals for planning, implementing, managing and monitoring FSSM interventions.
- To develop a policy framework with institutional support for capacity-building activities.
- To raise awareness and develop capacities towards building sustainable, climate-resilient sanitation services.
- The envisioned outcomes were developing a cadre of skilled professionals and engineers equipped with advanced FSSM knowledge, technical capacities for effective implementation, management and sustenance of SBM initiatives.

Training for Engineers

Recognizing the crucial role of engineers in FSSM, the Chhattisgarh Government, with support from UNICEF, organized a comprehensive training programme on 'Integrated Used Water and Septage Management in accordance with SBM 2.0'. This four-day online training aimed to equip engineers from municipalities across the state with the necessary expertise to plan, implement and manage FSSM interventions effectively.

The stakeholders identified for capacity building were categorized into the following groups:

Stakeholder Category	Stakeholders
Key Decision Makers	State/UT/ULB officials, District officials, Municipal Commissioners/Chief Officers, etc.
Executors/Implementers	ULB technical/field staff, health/sanitation inspectors, project units, engineers from allied departments, PM Fellows/interns
Field Institutions	Ward members, self-help groups (SHGs), non-governmental organizations (NGOs), community-based organizations (CBOs)
Elected Representatives	State/District/ULB elected representatives, Councillors, Mayors
Key Influencers	NGO leaders, social workers, doctors, SHGs, media, faith leaders, resident welfare associations (RWAs)
Others	Academic institutions, incubation centres, start-ups, corporates (corporate social responsibility (CSR))

The stakeholders identified for specialized training were as follows:

Stakeholders	Roles & Responsibilities
SafaiMitras/Sanitation Workers	Desludging, usage of safety gear
Treatment Plant Operators	FS handling, processing & disposal, O&M, record keeping, safety gear usage
Vehicle Operators	Operating desludging/collection vehicles, safety gear usage
Contractors	Standardizing technical capabilities based on the scope of work
Masons	Construction of toilets/septic tanks/treatment plants as per guidelines
SHGs	Suitable roles based on city context (e.g. desludging, FSTP operations)
NGOs and CBOs	Suitable roles based on city context (e.g. FSTP operations, repairs and maintenance)

Key Content Areas

The training programme covered a wide range of FSSM topics, including the following:

- Fundamentals of Used Water and Citywide Inclusive Sanitation: Participants gained a thorough understanding of the sanitation service chain, challenges associated with urban sanitation and strategies for achieving ODF++ status.
- Environmental Regulations and Standards: The training emphasized the importance of adhering to national and state environmental regulations and standards for used water and FSSM.
- Decentralized Treatment Technologies: Engineers were introduced to various decentralized treatment technologies, such as constructed wetlands, DEWATS and packaged sewage treatment plants, and their suitability for different urban contexts.
- Design Principles and Site Selection: The training covered key considerations for selecting appropriate FSSM technology and designing treatment plants, including hydraulic zoning, topography, groundwater levels and accessibility.
- Operation and Maintenance: Best practices for operating and maintaining FSSM infrastructure were discussed to ensure long-term sustainability and efficiency.
- Monitoring Protocols: Participants learned about methods and tools for monitoring FSSM performance and evaluating the impact of interventions, including regular checks of settled sludge levels, backwashing of filters and water quality testing.
- Case Studies: Real-world examples of successful FSSM implementation in India and other countries were shared to provide practical insights and inspiration.

During the FSSM training in Chhattisgarh, professional lectures and discussions were conducted virtually. Interactive learning was made possible by the usage of the polls. Among the panellists and guest speakers were:

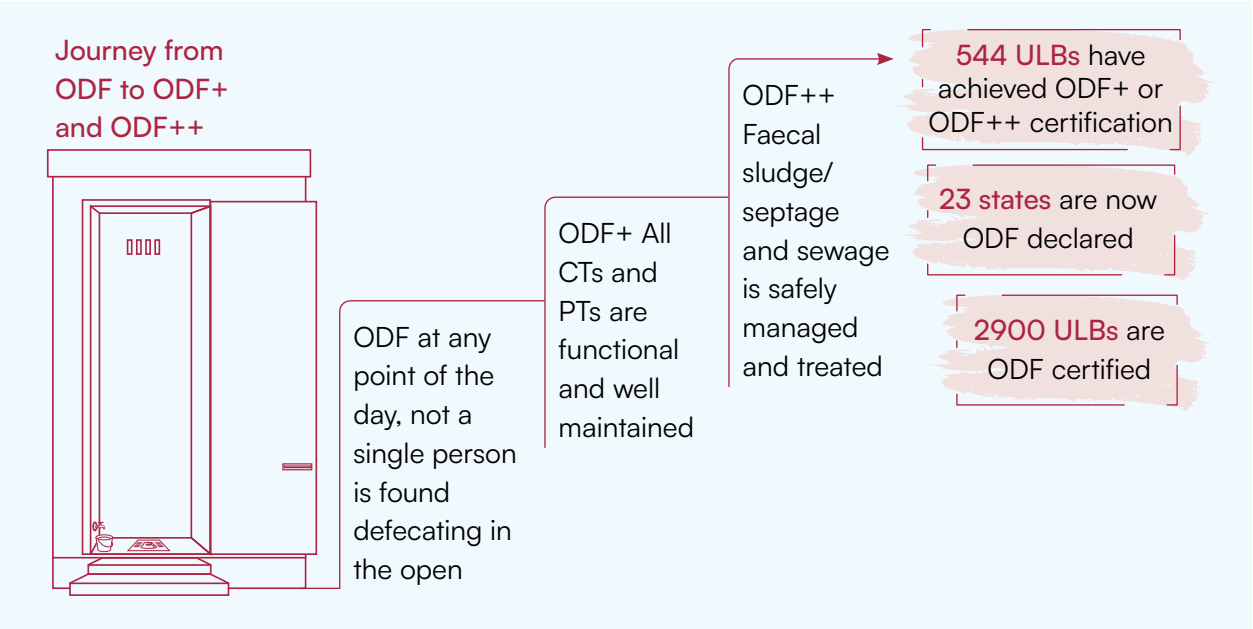
- Professor V. Srinivas Chary — Course Director, FSSM Expert
- Dr. Y. Malini Reddy — Course Director, FSSM Expert
- Dr. Rajarshi Banerjee — Assistant Professor, FSSM Expert
- Mr. Shivnath Patil — Design Engineer
- Mr. Krishna Kumar — Environmental Engineer
- Mr. Sheik Mohammed Shibl — Sanitation Expert

The topics covered in the training on FSSM in Chhattisgarh included the following

During the training on FSSM in Chhattisgarh, case studies and success stories were shared with the participants to enhance their learning experience. The participants had the opportunity to take lessons from the cases of small-scale decentralized sewage treatment technologies, which likely included real-world examples and best practices in the field of FSSM.

- Introduction to Urban Sanitation: Challenges and Solutions
- Understanding the Sanitation Service Chain
- Strategies Adopted by States to Achieve ODF Cities
- Difference Between Black and Grey Water, Sludge and Septage
- Faecal Sludge Management Concepts
- National/State-level Policies and Programmes, Manual Scavenging, Gender and Social Concerns
- Treatment Chain for Integrated Faecal Sludge and Septage Management (IFSM)
- Criteria for Selection of Appropriate Faecal Sludge and Septage Treatment Options
- Different Decentralized Treatment Technologies

Figure 1: Presentation by ASCI on FSSM



Source: *Swachh Survekshan 2019, report*

- Leadership Development for Citywide Inclusive Sanitation
- Relevance of FSSM/NSS, Policies and Programmes
- Safe Sanitation and Equity and Inclusion
- Citywide Inclusive Sanitation (CWIS) and Sustainable Development Goals (SDGs)
- Sanitation Systems: Non-Sewer System, Sewer System, Mixed Sanitation System
- Comparison of Conventional Sewerage Systems with Septage Management

Impact

The training programme has had a significant impact on Chhattisgarh's FSSM initiatives:

- **Enhanced Capacity of Engineers:** Engineers are now better equipped to design, implement and manage FSSM projects in their respective municipalities.
- **Improved FSSM Infrastructure:** The knowledge gained from the training has led to the development of more efficient and sustainable FSSM infrastructure across the state.
- **Increased Reuse of Treated Water:** Engineers are now promoting the reuse of treated water for nonpotable purposes, such as irrigation, flushing and industrial applications, contributing to water conservation.
- **Reduced Environmental Pollution:** Proper FSSM practices have significantly reduced the contamination of water bodies and improved environmental health.
- **Community Benefits:** Communities are benefiting from improved sanitation services, leading to better health outcomes and a cleaner environment.

Lessons Learned

Chhattisgarh's experience in engineer training for FSSM offers valuable lessons for other regions:

- **Investing in Capacity Building:** Training programmes are essential for equipping engineers with the necessary skills and knowledge for effective FSSM implementation.
- **Tailoring Training to Local Needs:** Training content should be tailored to the specific challenges and opportunities of each region.

- **Promoting Collaboration and Knowledge Sharing:** Creating platforms for engineers to share experiences and best practices is crucial for continuous improvement.
- **Emphasizing Sustainability:** Training sessions should focus on designing and operating FSSM infrastructure in a sustainable and cost-effective manner.
- **Monitoring and Evaluation:** Regular monitoring and evaluation are essential for assessing the impact of training programmes and identifying areas for improvement.

The training programme aimed to extend the capacities of engineers on Integrated Used Water and Septage Management in accordance with SBM 2.0. The learning outcomes of the programme included understanding the key components and concepts of Used Water and Citywide Inclusive Sanitation, recalling and applying environmental standards and regulations, appreciating the nuances of different nature-based solutions for the treatment of used water and septage, illustrating the importance of operation and maintenance of treatment facilities and taking lessons from the cases of small-scale decentralized sewage treatment technologies.

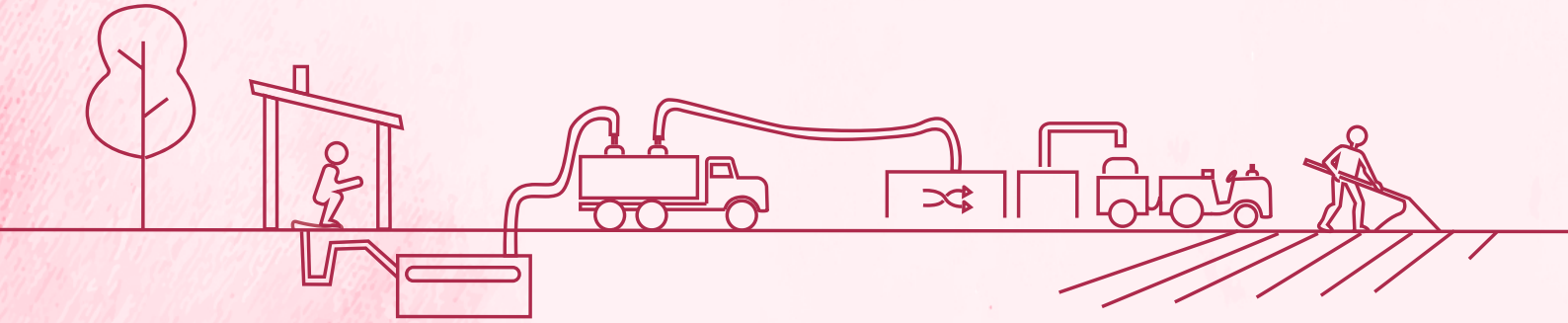
Conclusion

Chhattisgarh's success in FSSM is a testament to the importance of investing in engineer training. By empowering engineers with the necessary expertise, the state has made significant strides towards achieving sustainable sanitation and improving the lives of its citizens. This model can serve as an inspiration for other regions seeking to strengthen their FSSM initiatives and contribute to a cleaner and healthier future.

The plan recognizes that achieving the holistic vision of citywide inclusive sanitation requires concerted efforts towards building the capacities of key decision-makers, executors, field-level institutions, elected representatives, influencers and other relevant stakeholders. Through a judicious mix of theory and hands-on training tailored to the specific roles and responsibilities, the capacity-building initiatives aim to empower stakeholders with advanced technical know-how, managerial acumen and administrative skills necessary for effective planning, implementation and sustenance of FSSM interventions.

Overall, the State Capacity Building and Training Plan represents a strategic and holistic approach to capacity development, recognizing it as a continuous process that requires robust institutional mechanisms, policy support and sustained engagement. By investing in human resources and creating an enabling environment, the plan aims to catalyse a paradigm shift in Chhattisgarh's sanitation landscape, propelling the state towards realizing the vision of citywide inclusive sanitation and contributing to the broader goals of the Swachh Bharat Mission (Urban) 2.0.

C URBAN LOCAL BODY-LEVEL INTERVENTIONS



C 1: Bundu, Jharkhand: Toll-Free Initiative: Enhancing Access to Faecal Sludge and Septage Management Solutions

Introduction

Bundu Nagar panchayat in Jharkhand stands out for its proactive governance and community-driven solutions in Faecal Sludge and Septage Management (FSSM). Since the establishment of the Faecal Sludge Treatment Plant (FSTP) in November 2022, Bundu has remained steadfast in its mission to ensure the efficient treatment and disposal of faecal sludge within its jurisdiction.

Recognizing the pivotal role of community engagement in sustaining FSSM efforts, Bundu embarked on a comprehensive awareness campaign in collaboration with the UNICEF-TSU and the NEEDS team. Workshops, outreach programmes and community meetings were conducted to educate the residents about FSSM practices, the significance of the FSTP and the associated health benefits.

Despite these commendable efforts, accessibility remained a challenge, impeding the seamless delivery of FSSM services. To address this pressing issue, Bundu took a decisive step by introducing a toll-free number on 13 July 2023, under the advocacy of TSU-UNICEF. This initiative, coupled with an affordable tariff of Rs. 1,000 for the extraction and disposal of faecal sludge by cesspool vehicles, aimed to standardize the tariff and alleviate the financial burden on residents.

With the toll-free number now in place, citizens of Bundu can easily reach out to the urban local body (ULB) for septic tank emptying services. Whether lodging a complaint related to sludge desludging, scheduling maintenance or reporting delays or exorbitant charges by cesspool vehicles, residents now have a direct line of communication to ensure their sanitation needs are met promptly and efficiently.

Faecal sludge collection vehicle in Bundu

Impact

The impact of this initiative is manifold:

Accessibility: Citizens now have enhanced access to septic tank emptying services, eliminating barriers and ensuring inclusivity.

Prompt Response: The introduction of the toll-free number facilitates quick reporting and response, leading to the timely emptying of septic tanks and preventing potential sanitation issues.

Awareness and Convenience: By educating citizens about the importance of regular septic tank maintenance and proper disposal practices, the initiative promotes public health and environmental consciousness, fostering a culture of responsible sanitation practices.

In conclusion, Bundu panchayat establishing a toll-free number for sanitation services goes beyond managing cesspool vehicle availability and curbing unauthorized dumping; it also focuses on raising public awareness and encouraging demand for scheduled desludging among ordinary citizens. The notable 30 per cent increase in demand recorded in the registry at the Faecal Sludge Treatment Plant reflects the success of this initiative.

Wall painting about desludging

State level discussion with ULB Bundu

C 2: A Journey Towards Citywide Inclusive Sanitation Through Effective Community Mobilization for Budhni City, Madhya Pradesh

Introduction

The Swachh Bharat Mission (Urban) aims to enhance cleanliness, hygiene and waste management in cities, significantly emphasizing safe sanitation practices and community involvement. A crucial element of this initiative is Faecal Sludge and Septage Management (FSSM), which is intended to ensure the sustainability and efficacy of sanitation measures. Urban FSSM faces hurdles such as altering entrenched sanitation habits, overcoming infrastructural and resource limitations, coordination among diverse administrative levels and devising scalable, enduring solutions. A multifaceted strategy is needed, merging policy reform, community outreach, technological innovation and considerable infrastructure and human resources investment. Madhya Pradesh achieved notable progress with 400 of its 411 urban local bodies (ULBs) installing Faecal Sludge Treatment Plants (FSTPs) or Sewerage Treatment Plants (STPs). A majority of the urban areas possess vacuum trucks . A UNICEF assessment of 32 cities in early 2021 highlighted issues with FSTP functionality, underuse and operational difficulties.

Ashwini Shakhya of Budhni now enjoys a cleaner environment and healthier lifestyle thanks to her home's sewer connection. Previously, her community faced unsanitary conditions, foul odours and health hazards, particularly affecting her child. Influenced by the FSSM campaign, she opted for better sanitation and connection to the sewerage system, markedly enhancing life for both her and her child.

Beneficiary Ashwini Shakhya from Budhni

Programmatic Achievement: Streamlined FSSM contributing to improved sanitation in Budhni city, resulting in accreditation as first city to achieve Water Plus tag in small city category.

IEC campaigning activity on FSSM in Budhni city

Background

After recognizing the evident need to address these challenges, UNICEF and the Bill and Melinda Gates Foundation partnered with the Urban Development and Housing Department (UDHD), Government of Madhya Pradesh, to provide technical assistance for improving FSSM in the state and implement Government-mandated FSSM initiatives. The partnership also included a pilot project in collaboration with WaterAid India to demonstrate Citywide Inclusive Sanitation (CWIS) in two towns, Pithampur and Budhni. It focused on providing strategic planning, capacity building, technical and human resource base and monitoring support to the state, extended by the Directorate of Urban Administration and Development (DUAD). This initiative also aimed to gather insights from the pilot ULBs to facilitate a high-quality expansion of FSSM policy within the state and disseminate the learnings at the state level to be scaled up by other urban local bodies.

Budhni is a town on the banks of Narmada River in the Sehore district of Madhya Pradesh. As of the 2011 census, the town had a population of 16,808.

Strategic Approaches to Strengthen FSSM Communication in Budhni City

The following approaches were implemented:

- Assessment of FSSM Knowledge, Attitude and Practice as part of Baseline Studies
  - Baseline studies to understand the community's current knowledge, attitudes and practices related to FSSM.
  - Identify gaps and potential barriers to adopting FSSM practices.
- Development of Social and Behaviour Change Communication (SBCC) Strategy
  - A comprehensive SBCC strategy addressing identified gaps and leveraging opportunities to improve FSSM practices.
  - Ensuring the strategy is inclusive and addresses the needs of diverse community segments.
- SBCC Plan Development as Part of Citywide Inclusive Sanitation (CWIS) Planning

STRATEGIC APPROACH

Assessment

- FSSM knowledge, attitude and practices
- Identifying critical communication gaps

1

SBC Strategy

- Contextualized address
- Modules and materials development
- Field testing

2

Planning

- CB and SBC integrated with ULB CWIS plan
- Earmarked budgetary provision
- Timeline

3

SBC Package

- Contextualized address
- Modules and materials development
- Field testing

4

Capacity Building

- Master trainers, functionaries and front line workers, CB package and module

5

Communication Campaign

- Dissemination of critical messages
- Focusing on safe FSSM and WASH practices
- Volunteer engagement

6

Outreach Monitoring

- Deploying system for campaign reporting
- Periodic departmental review

7

Impact Evaluation

- Endline assessment
- Pit emptying request tracked

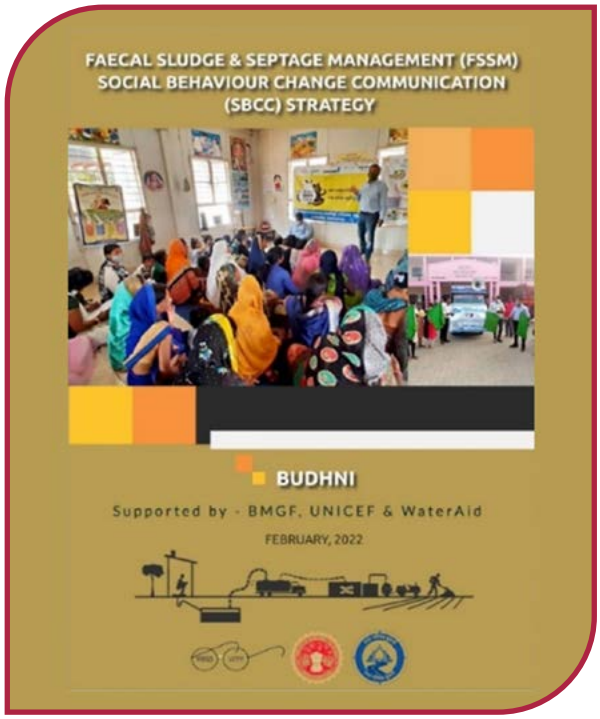
8

- Integrating SBCC plans into the CWIS plan to ensure alignment with overall sanitation goals.
- Plan for targeted, strategic communication interventions that support FSSM adoption at the community level.

- Development of Contextualized Social and Behaviour Change Communication (SBCC) Materials, Modules and Field Testing
  - SBBC materials and educational modules tailored to the local context and cultural norms.
  - Field testing of these materials to ensure their effectiveness and acceptability among the target audience.
- Capacity building of functionaries, front-line workers and sector partners on the social behaviour change (SBC) Materials:
  - Upskilling Government functionaries, front-line workers and sector partners to effectively use SBC modules and materials.
  - Ensure these stakeholders are well-equipped to support community-level change.
- Rolling Out Communication Campaign
  - Comprehensive communication campaign using various platforms (e.g., social media, community meetings, local radio).
  - Utilize storytelling, testimonials and other engaging methods to motivate behaviour change.
- Deploying a System to Monitor Outreach
  - A monitoring system to track the reach and effectiveness of SBC activities.
  - Data usage to adjust strategies and tactics for enhanced impact.
- Evaluating Communication Impact on FSSM Demand Generation by Endline Survey
  - Endline surveys to measure the impact of communication efforts on changes in knowledge, attitude and practices (KAP) and demand for FSSM.
  - Use findings to refine future SBC strategies and contribute to the evidence base on effective FSSM promotion.

Situation Analysis for FSSM in Budhni

The evaluation process commenced with a desk review to quickly assess the sanitation landscape within the Budhni urban local body (ULB). This initial phase was followed by a comprehensive baseline assessment incorporating in-depth interviews and focus group discussions (FGDs) with households (HHs), caretakers of public and community toilets and desludging operators. These discussions were pivotal in collecting data on the community's knowledge, attitudes and practices (KAP) concerning FSSM. Through FGDs and stakeholder consultations, insights into perceptions, practices and the operational aspects of FSSM in Pithampur were consolidated. This included understanding the generation, collection, transportation and



SBCC strategy document Developed form Budhni

treatment of faecal sludge, alongside evaluating the effectiveness of existing FSSM services. Key behavioural changes needed among various stakeholders were identified, alongside effective communication channels to engage them. This phase yielded several critical data points, enhancing the understanding of FSSM's current state and areas for improvement. The evaluation revealed the following:

- 90 households in Budhni town do not have access to toilets, and 87 per cent of the total sludge is safely contained in the town but yet to be emptied as most people lack knowledge of schedule desludging.
- 63 per cent of the effluent generated in the city is discharged into the open environment.
- More than 2,000 households out of the town's 3,450 were disconnected from the sewer network, leading to indiscriminate disposal of partially treated wastewater into drains and water bodies, which polluted the environment.

Key Qualitative Highlights Related to FSSM KAP from the Situational Analysis

Knowledge

- **Lack of Awareness:** Community members are unaware of the importance of proper FSSM and its impact on health and the environment.
- **Misunderstandings about FSSM Processes:** There's often a lack of understanding of how FSSM systems work, leading to misconceptions and resistance.
- **Information Gap:** Significant gap between the information available and the specific knowledge the community needs, for example, desludging request drop-in method.

Attitude

- **Cultural and Social Norms:** Cultural beliefs and practices may hinder the adoption of new sanitation practices, especially when they involve changes in long-standing behaviours.
- **Resistance to Change:** Resistance to adopting new faecal waste disposal methods, for example, incidence of manual scavenging.
- **Stigmatization:** Faecal Sludge Management may be stigmatized, making community members reluctant to discuss or engage with related initiatives.
- **Low Priority for Sanitation:** Sanitation might not be prioritized over other immediate community needs and challenges.

Practices

- **Inadequate Infrastructure:** There is a lack of access to the necessary infrastructure for proper FSSM, including facilities for retrofitting, treatment and disposal.
- **Financial Constraints:** High costs associated with implementing and maintaining FSSM systems poses a significant barrier for many communities.
- **Policy and Regulatory Hurdles:** Inconsistent or non-existent regulatory frameworks, leading to the unorganized implementation of effective FSSM practices.
- **Limited Technical Expertise:** Communities often lack access to the technical expertise required to design, implement and maintain FSSM solutions.
- **Poor Maintenance and Sustainability:** Even when FSSM systems are in place, poor maintenance practices and lack of sustainability plans lead to system failures.

Tackling these issues demanded a comprehensive strategy involving community involvement, education, skill enhancement, affordable technology and collaboration with policymakers for regulatory support and sustainable financing.

Critical Steps to Implement the SBCC Strategy

Based on these findings, a comprehensive SBCC strategy was developed to guide interventions and communication materials were developed to implement the strategy:

1. Setting up Key Objectives of the SBCC Strategy

- Achieving demand-based social FSSM behavioural norms in the identified ULB by enhancing the knowledge, attitude and practice (KAP) base of the community on water, sanitation and hygiene (WASH) and FSSM.
- Upskilling the capacity of departmental stakeholders and sector partners on FSSM and WASH.
- Improving households' access to the sewer connection, safe sanitation accessibility and constructing/retrofitting toilets.

2. Developing a Communication Framework as Part of the Strategy

The analysis highlighted engaging self-help group (SHG) members, Mohalla Samiti members and students as volunteers to encourage community participation. It outlined strategies for reaching key audiences through channels like print, TV and social media, alongside interpersonal and theatrical methods. Initiatives also focused on competitions, awareness rallies and training for SHG members, Mohalla Samiti members, ULB team members and sanitation workers to enhance their soft skills.

3. Behaviour Change Communication for Mobilizing Households for Sewer Connection where available

The communication strategy emphasized mass mobilization via the Malasur campaign and direct conversations with households and key stakeholders. Training for SHGs, service providers and ULB staff aimed to deliver key messages and foster community dialogue.

4. Building Up the Campaigns on Identified Critical FSSM and WASH Messages

Retrofitting of toilets	Waste segregation at the source
Emptying demand drop-in methodology	Scheduled desludging of septic tanks
O&M of individual and community toilets	Handwashing with soap

5. Contextualized SBCC Materials

Educational materials, including brochures, posters, leaflets and wall writings, were created and distributed within the ULB. Comprehensive outreach was ensured through localized jingles, community interactive theatres, traditional media forms, student-led rallies and social media initiatives.

Mobilizing the Community to Improve Access to the Sewer Network

A community-centric approach was adopted to foster participation and action. Spearheaded by SHGs and neighbourhood committees,

Meeting with the mohalla samiti members in Budhni.

Awareness campaign on World Toilet Day

efforts focused on securing household sewer connections and navigating initial hesitations due to concerns such as odour. Despite certain obstacles at the ULB level, these SHGs were instrumental in promoting cleaner environments, often leading by example in adopting sewer connections and motivating others. Supported by strategic communication and the support of organizations like WaterAid India and UNICEF, as well as ULB, their initiatives have markedly improved waste management and sewer connection rates, showcasing the impact of community engagement and female leadership in advancing inclusive sanitation solutions.

Infrastructure Development

The CWIS plan resulted in advocacy with the State Government and mobilizing USD 55.3 million to construct a 2.2 MLD sewage treatment plant, a 1.2 MLD decentralized wastewater treatment system and sewerage lines in the town.

Critical Results Achieved

- Budhni became the first town in the country to achieve Water Plus status, treating wastewater satisfactorily before it is released to the environment.
- Communication campaigns reached 15,000 people with essential FSSM information.
- SBCC campaigns facilitated sewer connections to 1,495 households and improved sanitation in another 90 households.
- Utilizing insights from two pilot towns, UNICEF supported the UDHD in formulating the state's FSSM policy, recently inaugurated by the honourable minister at a state event.

Sewerage Treatment Plant with SBR (Sequencing Batch Reactor) technology of 2.2 MLD capacity

1.2 MLD DEWATS treatment facility at Budhni is servicing approximately 1,000 HHs

Way Forward

- Sharing the learning with stakeholders from the UDHD department and other ULBs.
- Technical assistance to the State Government towards advocacy and programmatic run for scaling-up CWIS in other ULBs.
- Building up a repository of case studies, evaluation studies and SBC materials for others as a reference material.

Afsana, 25, from ward 13, saw her community's 60 households grapple with open defecation and the perils of stagnant water, lacking proper sanitation. This harsh reality compelled her to send her children to safer locations for their education, especially during the harsh rainy seasons. The challenge of depending on a single water pump was overwhelming. She benefitted from the intervention by the ULB, UNICEF and WaterAid India, whose joint assessment sparked essential improvements in water and sanitation planning. Thanks to these efforts, her community now enjoys upgraded WASH facilities, significantly enhancing her family's well-being and happiness.

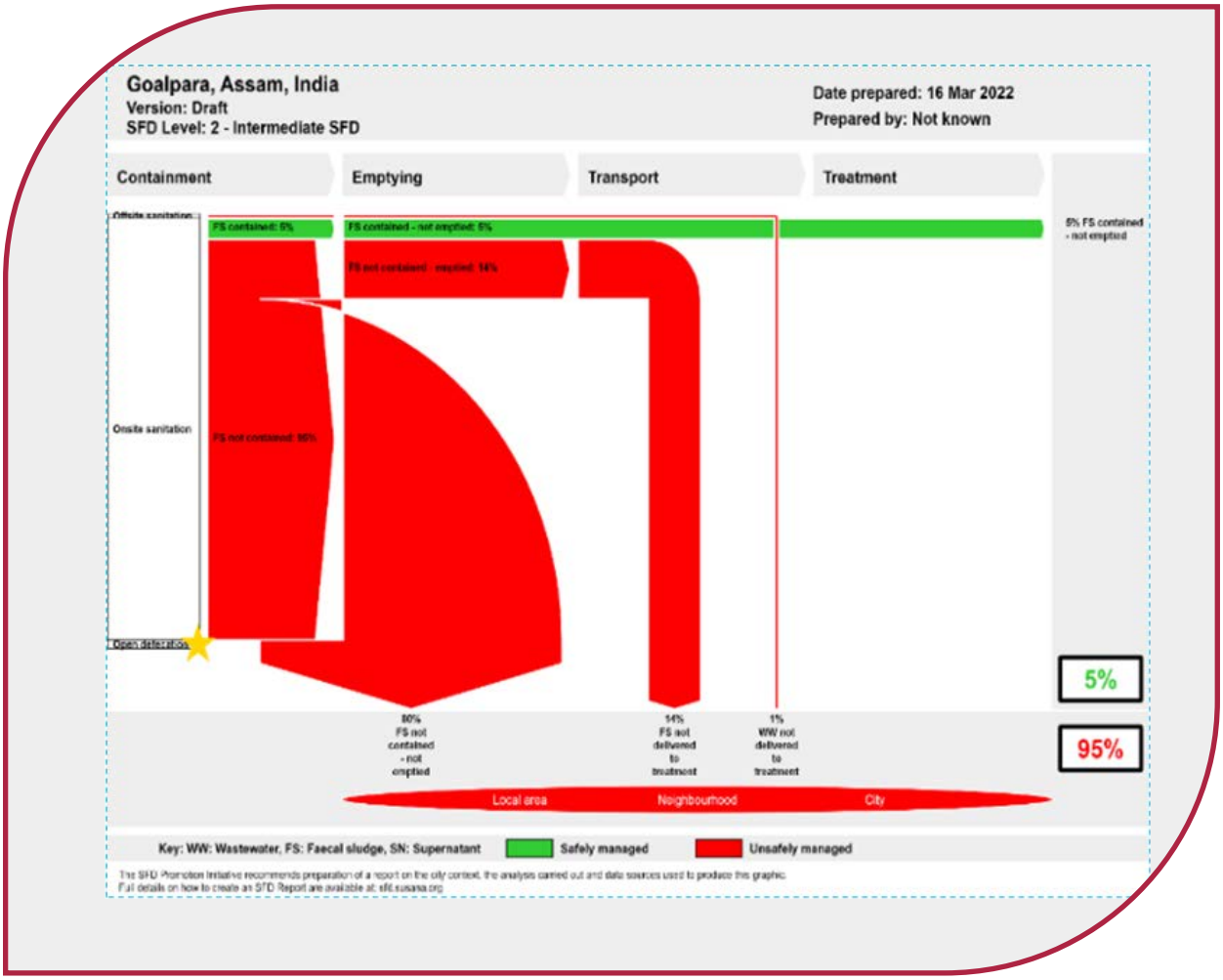
Beneficiary Afsana from Budhni

C 3: The Transformational Journey in Assam: Goalpara ULB's Faecal Sludge Management

Introduction

Faecal Sludge and Septage Management (FSSM) involves treating used water/ wastewater and managing the entire sanitation value chain. This includes collection, emptying, transport, treatment, disposal and reuse of faecal sludge/septage from onsite sanitation systems.

The efforts of the Swachh Bharat Mission and open defecation free (ODF) declaration have increased the number of toilets connected to onsite systems, but offsite sanitation systems have not yet grown. Assam had a low coverage of Faecal Sludge Management (FSM) systems. Proper management of faecal sludge and septage is crucial for environmental cleanliness and upkeep of public health.



The diagram is derived from the Sample Baseline survey. The red indicates unsafely managed excreta, i.e., 95 per cent and the green denotes safely managed excreta, i.e., 5 per cent

Understanding the Problem

Goalpara is located on the banks of the Brahmaputra River. According to the 2011 census, This town has a population of 53,430 with a floating population of approximately 5,000. It has 11,617 households. The area of Goalpara is 12.79 sq. km. According to the Ministry of Housing and Urban Affairs (MoHUA) ODF survey, Goalpara has achieved the ODF status. All toilets are connected to onsite sanitation systems (septic tanks and twin pits). Due to high groundwater table, there is a risk of groundwater pollution; 95 per cent of faecal matter is not contained safely, and only 14 per cent of households with onsite sanitation systems have dislodged their systems; the remaining 86 per cent have never dislodged their containment systems. Only 5 per cent of toilets have fully lined tanks with no outlets, ensuring safe management of excreta. The town lacked Faecal Sludge Treatment Plant (FSTP), resulting in unsafe disposal of faecal sludge into the environment.

Planning and the Project Framework

UNICEF, in partnership with Bill and Melinda Gates Foundation (BMGF), initiated an FSSM support project in Assam, in March 2021, covering the major objectives of FSSM: (1) planning, treatment and management of faecal sludge; (2) roll out of Social and Behaviour Change Communication (SBCC) and Information, Education and Communication (IEC); (3) institutional strengthening; (4) state scale-up through coordination, improved monitoring systems and evidence-based engagement with stakeholders; (5) set up a state-level Technical Support Unit (TSU) for identifying and strengthening innovative models and supporting scale-up across the state.

Capacity Building of Urban Local Body and Community-based Organizations

The TSU developed Goalpara district's SBCC strategy and IEC plan. IEC communication materials were developed by TSU and disseminated to the public. Ward-level committees were formed to carry out awareness activities with the support of self-help groups (SHGs) and ward commissioners. With the help of Women Development Centre (WDC), the local NGO partner of UNICEF, the TSU carried out citywide IEC/SBC activities like street plays, vehicle branding, displaying banners and wall painting at strategic locations. It also conducted training for stakeholders, including Government officials, elected representatives, cesspool workers, SHG members, masons and construction workers under the training and capacity-building programme.

Social mapping exercise with community

Infrastructure Development

With the support and handholding of UNICEF, the urban local body (ULB) was convinced to plan and build a 7 kilolitre per day (KLD) FSTP plant. For the safe disposal of faecal sludge, the ULB adopted the Tiger Biofilter Technology (TBF) to treat the generated sludge. The process included activities such as site survey, layout planning, site cleaning, FSTP construction and tree plantation.

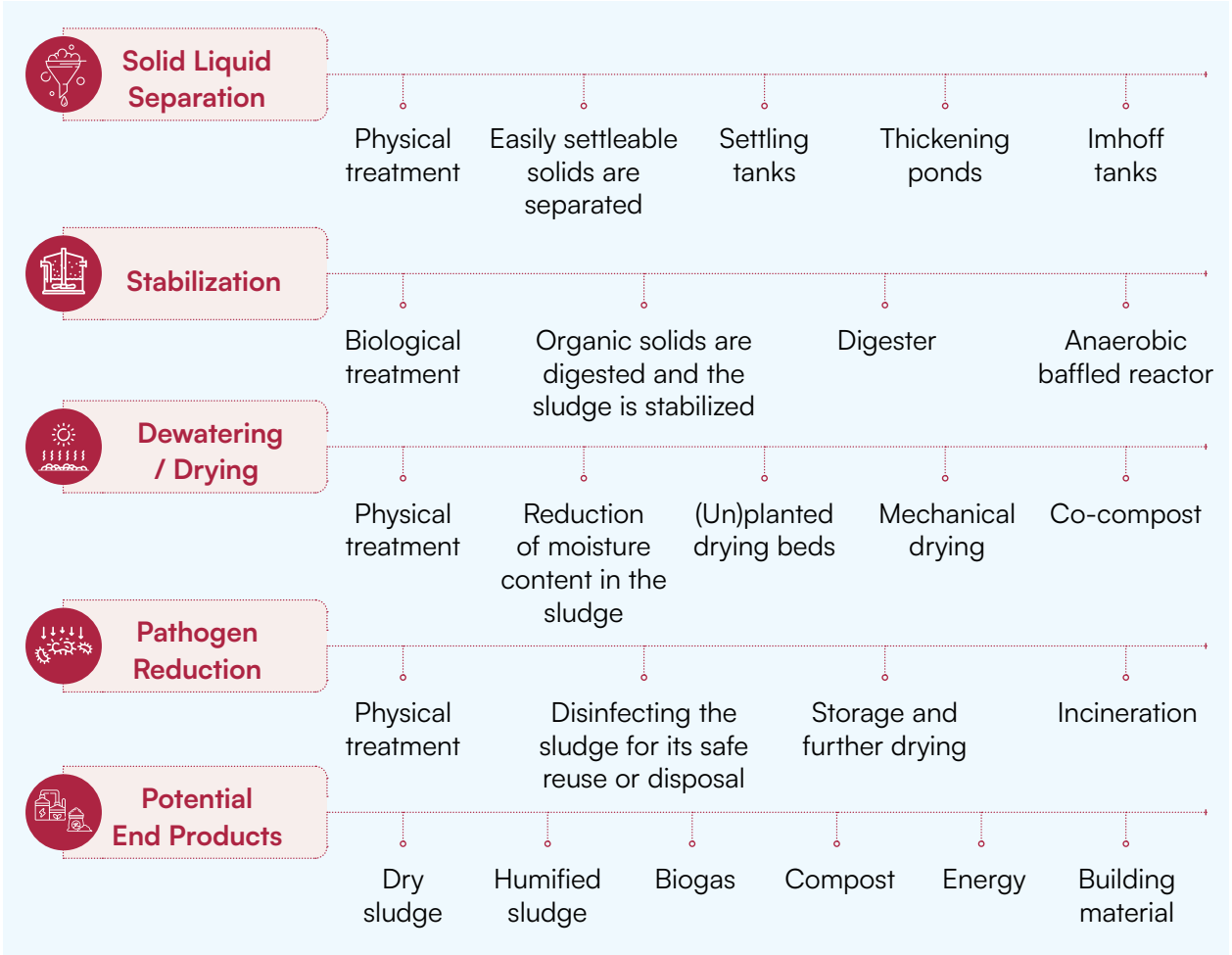
Meeting of Unicef/BMGF teams with District and Municipal Board officials

Inauguration of FSTP

The Hon'ble State Minister, Department of Housing and Urban Affairs (DoHUA), Mr. Ashok Singhal, inaugurated the 7 KLD FSTP in ward no. 18, Goalpara, dated 28 June 2023, in the presence of Ms. Kavitha Padmanabhan, IAS, Commissioner and Secretary, DoHUA, Dr. Madhulika Jonathan, Chief, UNICEF Assam and North-East State, Mr. Tithal Parmar, WASH Specialist, UNICEF Assam and North-Eastern states and all the concerned departments and stakeholders.

Inauguration of FSTP Goalpara by Hon'ble minister, Government of Assam

The Process of the TBF Technology Adopted



Operations and Maintenance (O&M) of FSTP

For the operation and maintenance (O&M) of FSTP, the Gopalpura ULB signed a MoU with the PriMove Infrastructure Development Consultants Pvt. Ltd initially for one year. After that, ULB is planning to start training local stakeholders with the current service provider for the O&M of FSTP, which will help improve the sanitation and prevent pollution of water bodies and the Brahmaputra river.

Impact and Benefits

The Faecal Sludge Treatment facility in Goalpara will bring about significant benefits and advantages. First, it provides a dedicated plant to treat the sludge produced. This will prevent the random dumping of sludge, which has the potential to contaminate soil and water sources. Second, the facility will contribute to health by reducing the risk of waterborne diseases and contamination. Proper treatment of sludge ensures that harmful pathogens and pollutants are effectively eliminated or neutralized before being disposed of or reused. Third, this project has a potential for creating job opportunities for residents if it is improved on the business model aspects. Presently, it produces treated water and manure that can be used or sold. The FSTP, in a span of four months, post commissioning, was able to treat 110,900 litres of sludge. The installation of a transformer was delayed by three months because of power fluctuations . The other challenge the ULB faces is getting the households to desludge regularly.

Sustainability and Future Plans

To ensure the optimum utilization of the FSTP capacity, it is crucial to implement proper planning and raise awareness among the community about its importance. Additionally, the adoption of relevant bylaws can further facilitate its effective use. The bylaws for the FSM system are in the process of being rolled out. The operation and maintenance of the FSTP will be handled by a professional agency, which will be responsible for ensuring its smooth functioning and adherence to environmental standards.

Further, empowering the local community by providing training to the SHGs or individuals within the community can create an income generation model for Goalpara and the broader regions of Assam. The end products of treated water and manure obtained by the treatment of sludge. By integrating community participation and effective management, the FSTPs can serve as a valuable asset for Goalpara, benefiting both the environment and the local economy. It is an important milestone for Goalpara in getting rated as one of the cleaner towns.

Unicef WASH specialist addressing meeting at Assam

C 4: Chhattisgarh: Ambikapur's Journey in Faecal Sludge and Septage Management

Introduction

Since 2014, sanitation has remained on top of development agenda in India, resulting in an increase in sanitation coverage from 39 to 93 per cent across the country.[6] Sanitation value chain refers to the user interface, containment and conveyance, treatment and disposal of faecal waste. While an increase in construction of toilets eliminates the undignified practice of open defecation, it only addresses the first component of sanitation service chain, i.e., user interface. There is a need to focus on the entire sanitation value chain in order to provide tangible and sustainable solutions for proper collection, conveyance, treatment and disposal of faecal sludge and septage. Ambikapur's sanitation journey is documented in this article.

Chhattisgarh ranks as a leader in sanitation efforts and was awarded the first prize in Swachh Survekshan for three consecutive years. The state has achieved Open Defecation Free (ODF) status in all urban areas. Recognizing the importance of Faecal Sludge and Septage Management (FSSM), the state adopted a comprehensive policy in 2017 and was certified ODF++ by January 2020.

A significant portion of urban households in Chhattisgarh relies on onsite sanitation systems, producing substantial faecal sludge daily. UNICEF Chhattisgarh has been instrumental in the development of sanitation services since 2021, supporting FSSM initiatives in Ambikapur and Kumhari urban local bodies (ULBs), advocating for scaling up interventions and promoting sustainable sanitation practices.

Implementing FSSM in Ambikapur

Background

Ambikapur is one of the largest cities in Chhattisgarh state having a population of 1.45 lakh and 27,247 households. It is located in Surguja district and is geographically divided into 48 wards. The city is a national role model city for showcasing 100 per cent door-to-door collection, segregation and recycling of solid waste with the support of women's self-help groups (SHGs). The city was also first to be declared as Open Defecation Free (ODF) in the State. Ambikapur also is a leader in recognizing the pivotal role of FSSM by establishing the first Faecal Sludge Treatment Plant (FSTP) in the State.

Ambikapur city relies significantly on onsite sanitation systems, with approximately 80 per cent of household toilets connected to septic tanks. The management of faecal sludge and septage poses crucial challenges, particularly concerning adherence to Indian Standard Codes, efficient conveyance, treatment and safe disposal.

Collection

The septic tanks in Ambikapur often fail to comply with the Indian Standard Code (IS: 2470), leading to irregular desludging practices and oversized tank constructions. This non-adherence to standards results in a lack of awareness among households regarding regular cleaning and a continuing perception of constructing larger tanks to avoid frequent maintenance.

[6]https://jalshakti-ddws.gov.in/sites/default/files/MGISC_SBM_and_SDGs_WASH_Network.

Conveyance

The desludging operations in Ambikapur are managed by the ULB's sanitation department. They operate on a on-demand basis with an average of two septic tanks cleaned daily. The ULB receives cleaning requests through toll-free numbers and levies charges for these services. The ULB possesses four vacuum emptier trucks under the AMRUT programme facilitating efficient desludging operations within the city.

Treatment

Ambikapur has pioneered the establishment of a Faecal Sludge Treatment Plant (FSTP), setting a national benchmark for cost-effective and environmental-friendly faecal sludge management. The FSTP, commissioned in November 2017, employs the Hybrid Process of Bio-treatment with Moving Bed Biofilm Reactor (MBBR) technology and upgraded clarifier, chosen based on factors like land availability, cost, treatment quality and construction time. The FSTP's success is evident from its compliance with Chhattisgarh Pollution Control Board standards and its low operational costs and energy requirements.

The technology was elected as suitable to the local context of Ambikapur. City officials chose the hybrid process of bio-treatment with MBBR Technology and upgraded clarifier based on a number of factors, which included (i) the extent of available land, (ii) cost of construction and maintenance, (iii) quality of the treated septage and (iv) amount of time needed for construction. The city issued a tender for the design, manufacture, supply, erection, testing and commissioning of a 5 KLD hybrid faecal sludge treatment facility. The tender covered the operation and maintenance of the FSTP for one year post-commissioning. D.D. Enviro Engineering, Jabalpur, Madhya Pradesh, designed and constructed the FSTP.

The main features of Ambikapur FSTP are as follows:

- The FSTP requires less land owing to the compact unit sizes.
- The cost of construction is low as the units are pre-fabricated and hence requires less time for installation.
- The plant is easy to operate and requires low manpower.

Emptying of Faecal Sludge at the Ambikapur *FSTP.*

- The FSTP requires low energy for operation.
- Lamella tube settlers provide higher settling efficiency.
- MBBR process enables total nitrogen removal in compact spaces.

Reuse of Treated Effluent and Bio-solid

The treated effluent from the FSTP finds beneficial reuse in washing activities at the Solid Liquid Resource Management Centre (SLRMC) and for gardening purposes in the ULB's Sanitary Park. Additionally, the bio-solid generated is utilized within the Sanitary Park, showcasing a sustainable approach to waste management.

Ambikapur's journey in faecal sludge and septage management reflects a holistic approach, encompassing collection, conveyance, treatment and reuse. The city's adherence to standards, efficient operations and utilization of treated effluent and bio-solid underscore its commitment to sustainable sanitation practices. The success of Ambikapur's FSSM initiatives serves as a model for other urban areas, highlighting the importance of comprehensive faecal sludge management strategies in achieving safe and hygienic sanitation services.

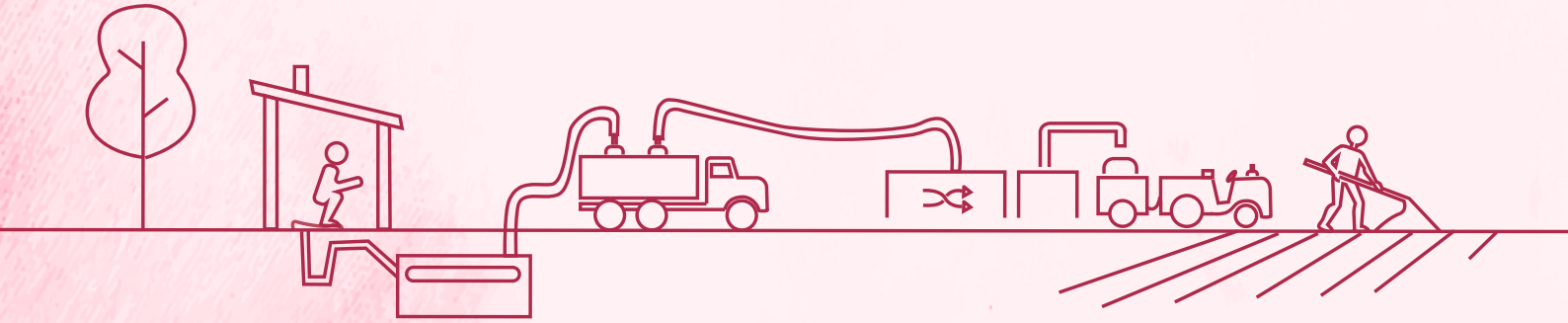
Lessons Learnt and Way Forward

Table 1: Sample Treated Effluent Quality Report

Sr. No.	Parameter	Treated Wastewater Quality	Discharge Standard for Inland Surface Water
1.	pH	7.5	5.5—9.0
2.	BOD, mg/l	8.0	<30
3.	COD, mg/l	34.2	<250
4.	TSS, mg/l	44.0	<100

- Currently, Ambikapur is practicing demand-based desludging of septic tanks. As the septic tanks are oversized or not as per IS standards, a smaller number of septic tanks are cleaned annually. To obtain the optimum treatment efficiency of septic tanks, Central Public Health and Environmental Engineering Organisation (CPHEEO) recommends cleaning septic tanks once in two to three years. Therefore, through UNICEF Chhattisgarh's technical support, the city is now planning to move towards scheduled septic tank desludging system. The city has also planned to increase the capacity of faecal sludge treatment by constructing three more decentralized faecal sludge and septage treatment plants.
- This technology (bio-treatment MBBR) can be easily replicated in other ULBs of the State and the country as this has proven to be a cost-effective and environmentally sustainable model.
- UNICEF Chhattisgarh has taken the initiative to conduct the baseline assessment with the objective of understanding the type of containment systems, on-ground desludging practices and faecal sludge treatment and disposal systems in households and establishments including commercial properties, public and community toilets and public institutions of Ambikapur. A quantitative household-level baseline assessment using a random sampling method is being conducted using the mWater app. Data will also be collected through a qualitative methodology using focus group discussions, key informant interviews of stakeholders and desk research.
- UNICEF has also collaborated with the Surguja district administration to facilitate convergence between the urban and rural areas for FSSM. Under this convergence, UNICEF will support in capacity building and training of various stakeholders involved in FSSM from the urban and rural areas. Ambikapur city will serve as a demonstration model for showcasing activities related to FSSM. This will help in achieving the objectives of urban—rural convergence as stated in SBM 2.0 guidelines for urban and rural areas.

D TECHNOLOGIES



D 1. Pithampur: Transforming Faecal Sludge and Septage Management (FSSM) through Technological Improvisations: A Success Story in Sustainable Sanitation

Introduction

The state of Madhya Pradesh has been a pioneer state for the Swachh Bharat Mission — Phase I and Phase II and the state's efforts have been recognized and acknowledged at the national level. UNICEF partnered with the state for strengthening and scaling up the initiatives of Citywide Inclusive Sanitation (CWIS) and Faecal Sludge and Septage Management (FSSM) and set up a Technical Support Unit (TSU) in the Urban Administration and Development Department. The local partner (WaterAid India) was engaged in the effort and two towns having different characteristics were selected — Pithampur and Budhni — to demonstrate the initiative and disseminate the learnings at national and state levels.

Background

Pithampur is an industrial hub within the Indore Metropolitan Region of Madhya Pradesh having a total population of 1,26,099 as per the 2011 census including a floating population in the town. In order to provide improved sanitation services, the urban local body (ULB) has constructed 18 community and public toilets and nearly 28,000 households have individual household-level toilets. These toilets have various types of containment structures that require regular emptying and transportation of septage to the treatment facility. From the flow diagram prepared during the baseline assessment, it was determined that 82 per cent of the Faecal Sludge (FS) needs to be emptied and treated. To treat such a large quantity of FS, a treatment facility is required in the ULB. However, ULB has a treatment plant that treats a mere 6 per cent of FS whereas the rest of the 94 per cent goes into the environment untreated and poses a health risk to the residents of Pithampur. The biggest challenge is the inefficiency of the emptying and transporting and treatment of FS and its disposal. Currently, the ULB has three desludging vehicles of 3,000-litre (two) and 4,000-litre (one) capacity, which are operated by the urban local body. A Faecal Sludge Treatment Plant (FSTP) of 20 kilolitre per day (KLD) capacity has also been installed. Due to lack of regular operation and maintenance of FSTP and limited capacity of ULB in operations and technical knowledge of FSTP, the ULB faced operational challenges for running the existing FSTP despite being declared Open Defecation Free (ODF) in 2018. Understanding the urgency of the requirement of running an efficient FSTP with limited knowledge of the operation of FSTP, Pithampur embarked on a monumental journey towards reviving its FSTP and requested TSU of UNICEF and the local partner to undertake a critical assessment. It devised an operational plan for the revival of FSTP to ensure efficient septage management and uphold its commitment to sustainable sanitation practices.

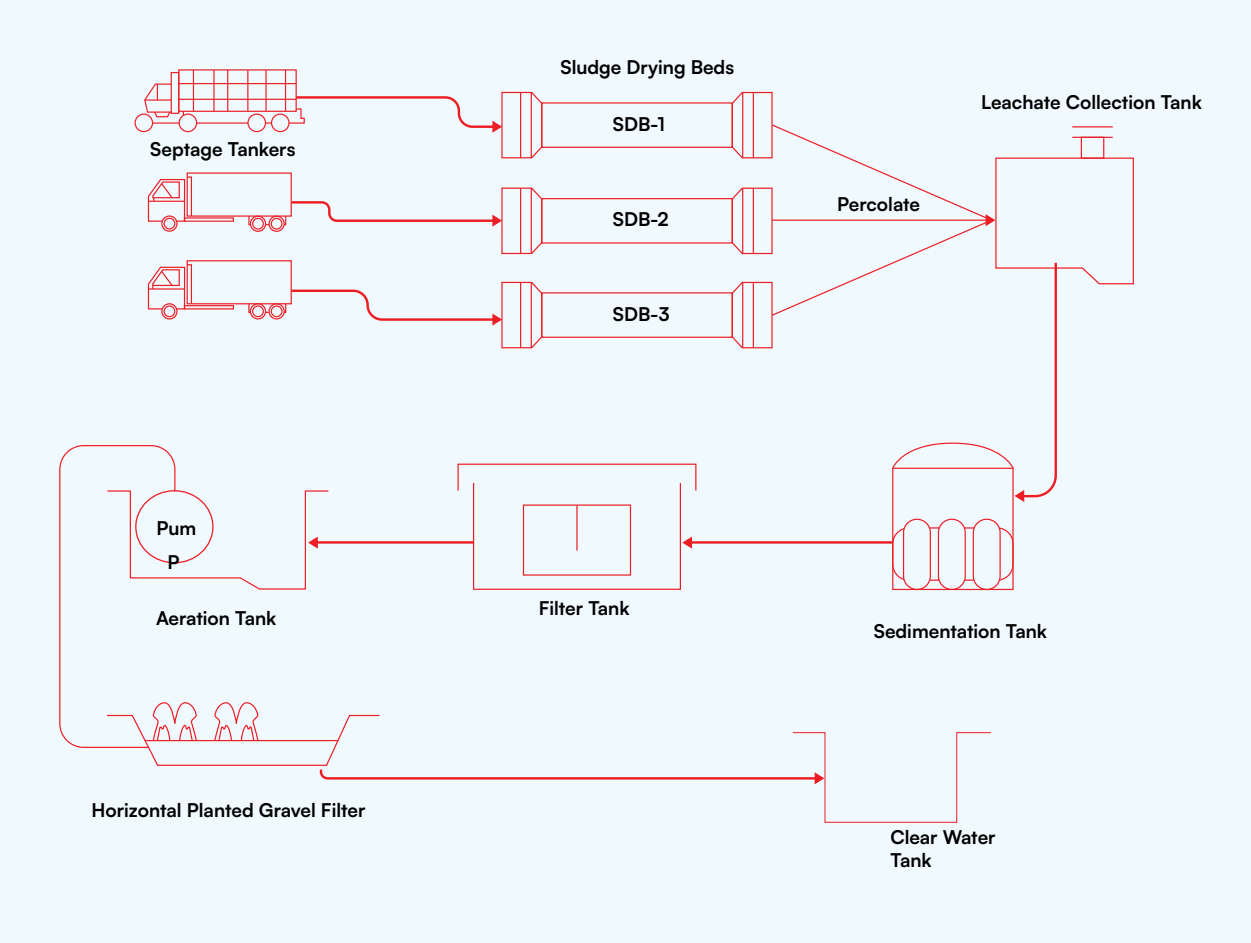
The FSTP is situated in ward no. 21 Sagore, Pithampur, which receives a daily average load of two to three trips of 3,000 litres of septage. When the UNICEF TSU team and the local partner visited the FSTP on 28 September 2021, it was revealed through visual inspection and key informant interviews and discussions that the sludge drying bed was overloaded beyond its capacity. It was also evident that the sludge drying beds were not able to separate the solid and liquid parts of the septage received at the beds and were full of solid waste, resulting in no supply of wastewater to the subsequent modules for further treatment. Therefore, it could be concluded that the FSTP was not functional and none of the modules were working.

Assessment of the Existing FSTP

The existing FSTP at Sagore, Pithampur (before retrofitting), had the following treatment modules in its process flow sequence for the treatment of faecal sludge and septage:

1. Sludge Drying Bed with shed — 3 nos.
2. Common leachate chamber for the Sludge Drying Beds
3. Sedimentation tank — 1 no.
4. Filtration Tank — 1 no.
5. Aeration tank — 1 no.
6. Planted Gravel Filter — 1 no.
7. Clear water tank — 1 no.

Figure 1: Process Flow of Existing FSTP



The following table shows the observation, proposed plan, implementation and the end result of the existing FSTP of Pithampur:

S. No.	Treatment Module Unit	Observation	Proposed Plan	Implementation	End Result	Before	After
1.	Ramp for desludging vehicle	No ramp for desludging vehicle was found during the visit and the desludging vehicle had to use the backflow pressure from the pump to desludge the septage into the drying bed, resulting in the displacement of filter media of the bed	A provision of the ramp would be necessary to meet the height of the tankers' outlet pipe for desludging in the screens and drying beds	A 1-metre-high ramp was constructed so that the height of the tanker's outlet pipe was above the drying bed's inlet (screen) for desludging	After retrofitting, the tankers were easily able to desludge into the planted drying beds without needing the backflow pressure, hence protecting the filter media displacement.	 *Existing ground level of the drying beds*	 *One-metre high ramp for desludging vehicles to desludge easily*
2.	Screen	No screens were found during the visit and the septage was directly dumped into the drying beds by the desludging vehicles due to which solid waste was found in the drying bed	To prevent the solids and inorganic matter from entering the beds, a provision of a suitable screening facility was required at each bed	A locally made iron mesh screen chamber (not designed technically but locally) was installed in all the three beds to prevent the inorganic wastes from entering the beds	The inorganic waste present in septage was easily blocked at the screen, which protected the planted drying beds from clogging	 *No screens were present before sludge drying beds*	 *Locally made iron mesh screen installed at each*  *Bed desludging of septage in the screen of the bed by desludging vehicle*

S. No.	Treatment Module Unit	Observation	Proposed Plan	Implementation	End Result	Before	After
3.	Unplanted Sludge Drying Bed	The civil structures of the plant were found in a satisfactory condition. The septage inlet pipes were higher, due to which the tankers were not able to desludge the septage in the inlet pipe and instead were dumping it directly into the bed via reverse flow pressure. The unplanted sludge drying beds were found to be without screening unit due to which the solid waste present in the septage had entered the beds, resulting in the choking of the beds and no water was percolating into	The existing three unplanted sludge drying beds were proposed to be converted into planted drying beds for better efficiency of the unit as the planted drying beds can accommodate more loading and treat the sludge more efficiently as compared to unplanted sludge drying beds. Moreover, the technical analysis suggested that the current modules were not able to handle 20 KLD of septage; therefore. any recommended revision in the	The unplanted sludge drying bed were converted into planted drying beds by placing leachate collection perforated pipes at the bottom along with vent pipes at the top with proper filter media and plantation of designated Canna Indica plants on the top of the beds.	The designated plants in the planted drying beds helped in faster drying of the sludge through a process called evapotranspiration. Furthermore, growth of the plants roots into the filter media ensures the porosity of the filter media and hence prevented choking.	 *Existing inlet level of the beds*	 *Placing perforated pipes at the bottom for collection of leachates from sludge*  *Replacing entire filter media of the beds*  *Drying Bed with vent pipes and replaced filter media*  *Planted drying bed with Canna Indica plantation*

S. No.	Treatment Module Unit	Observation	Proposed Plan	Implementation	End Result	Before	After
		the leachate collection tank. The septage was filled up to the brim in each sludge's drying bed due to which it required more time for drying. Mostly, the unplanted sludge's drying beds function efficiently when there is a recommended sludge layer of 250—300 mm in the beds.	treatment module would accommodate much lower capacity than 20 KLD. Subsequently, it was also suggested to plan an adequate number of treatment units for meeting the future demands. Filter media, vent pipes and designated plants were also suggested to be added to convert the existing beds into planted drying beds. In order to prevent the scraping of uppermost layer of sand with each cleaning cycle of dried sludge from the beds, it was recommended to provide hollow				

S. No.	Treatment Module Unit	Observation	Proposed Plan	Implementation	End Result	Before	After
			concrete paver blocks on the uppermost layer of filter media for the protection of uppermost layer and prevention of refilling it frequently.				
4.	Leachate Collection Tank	The civil structures of the module were found to be in a satisfactory condition.	No major interventions were made for the leachate collection tank except cleaning of the pipes.				
5.	Sedimen-tation Tank, Filter Tank, Aeration Tank	The sedimentation tank, filtration tank and aeration tank were found to be filled with solids and inorganic waste floating in it, which made it evident that these treatment modules were not performing as per their expectation.	Filter media of all treatment modules were needed to be changed and waterproofing should be done to prevent any leakage of wastewater.	Filter media of the sedimentation tank, filter tank and aeration tank was replaced. A baffle wall was also constructed in the sedimentation tank to increase its efficiency.	All other treatment modules were working fine and no visible solid particles were noticed.	 *Sedimentation tank, filtration tank and aeration tank units of existing FSTP.*	 *Construction of baffle wall and replacement of filter media in the sedimentation tank.*

S. No.	Treatment Module Unit	Observation	Proposed Plan	Implementation	End Result	Before	After
6.	Planted Gravel Filter	The liquid from the aeration tank was pumped to the planted gravel filter (PGF); however, the PGF had been reported non-functional due to the underground leakage, resulting in lesser quantity of treated water in the clear water tank.	The leakage of planted gravel filter was to be fixed with grouting works and replacement of filter media along with levelling of inlet and outlet pipes.	Waterproofing and leak proofing was done for the planted gravel filter and the filter media was replaced with new plantation of Canna indica.	There was no leaking in the planted gravel filter and treated water was reaching to the clear water tank.	 *Planted gravel filter unit with no lining at the bottom.*	 *Waterproofing of planted gravel filter.*  *Replacing filter media in planted gravel filter.*

S. No.	Treatment Module Unit	Observation	Proposed Plan	Implementation	End Result	Before	After
7.	Clear Water Tank	Less water with eutrophication was found out during the visit as the untreated water was reaching the clear water tank.	Waterproofing should be done to prevent any leakage of treated water to be reused for the landscaping of the FSTP premises.	Waterproofing and leak proofing were done for the clear water tank.	Clean water was received at the module, which is being utilized for landscaping of the FSTP premises	 *Clear water tank unit having eutrophication*	 *Waterproofing of clear water tank*
8.	Operation and Maintenance	No regular operation and maintenance was being done during our visit.	Regular operation and maintenance should be done and standard operating procedures to be formed with timelines for various treatment modules. of the FSTP	Standard operation procedure for each module with daily, weekly, monthly and annual maintenance tasks for the FSTP was developed and installed at the FSTP to facilitate smooth operation and maintenance of the FSTP.	The plant has been operational for more than a year after retrofitting and is able to easily handle the daily incoming load of approximately 3,000 litres and has not reported any breakdown in the past year.		 *Maintenance activities with timelines installed at the FSTP for reference to the operators*

Lessons Learnt

The technical recommendations were provided by UNICEF TSU and the local partner. The Pithampur ULB took up the responsibility of retrofitting the FSTP with its own municipal budgets and local resources (engineers, contractors, masons and labour) and completed the work in one year. This work of retrofitting of existing FSTP was also a part of short- and medium-term planning of CWIS planning. An additional FSTP is required with a higher capacity to cater to the current as well as the future demand of the Pithampur ULB. The construction of new FSTP with a higher capacity would also cater the requirement of scheduled desludging, which is planned for the Pithampur ULB to ensure improved sanitation delivery services are provided to all its residents and floating population.

It can be stated that the transformation of Pithampur's FSTP can be considered as a demonstration of the collaborative efforts of ULB, local partner and the UNICEF TSU. Through meticulous planning, diligent execution and unwavering commitment, the Pithampur ULB successfully revitalized its treatment plant, ensuring efficient septage management and advancement towards the achievement of its sanitation objective.

A clean and picturesque FSTP at Pithampur

D 2: Innovative Solutions for Used Water Treatment: A Technology Catalogue for Chhattisgarh's Small and Medium ULBs

A key component of SBM(U) 2.0 is Used Water Management, which aims to ensure that no untreated used water, including faecal sludge, is discharged into the open environment or water bodies in towns. Technology choice is critical for used water management in Chhattisgarh.

Needs

1. In Chhattisgarh, only 9.1 per cent of urban households are connected to sewerage networks, while 50.71 per cent of them depend on onsite sanitation facilities such as septic tanks and pit latrines for the collection of faecal sludge and wastewater.
2. The state faces challenges in managing used water due to lack of comprehensive sewage collection and conveyance networks, low household connections to existing Sewage Treatment Plants (STPs) and the absence of Faecal Sludge Treatment Plants (FSTPs) in most of the urban local bodies (ULBs).
3. Smaller ULBs in Chhattisgarh face constraints such as inadequate financial resources, limited institutional capacity and lack of technical expertise in establishing and managing conventional STPs.
4. There is a need to address these challenges by exploring cost-effective and nature-based solutions for used water management, especially in small and medium towns.

Challenges

1. In towns with individual FSTPs, these plants are incapable of treating the significant amount of greywater originating from kitchens, bathrooms and various washings.
2. Conventional mechanized or highly skilled STPs often encounter operational issues when implemented at the ULB level, leading to the discharge of untreated wastewater and the contamination of water bodies.
3. The absence of a comprehensive sewage collection and conveyance network, along with a low number of household connections, exacerbates the problem as only a fraction of the sewage generated by households reaches the STPs for treatment.

Components of Used Water Management

1. Sewage (used water): It comprises greywater from kitchens, bathrooms and washbasins as well as blackwater from toilets and urinals.

2. Generation of Domestic Used Water: It is expected that 80 per cent (108 litres per capita per day (LPCD)) of the 135 LPCD of potable water provided will be generated as used water.

3. Management of Used Water: The management encompasses collection, conveyance, treatment and recycling/ disposal of all flows.

4. Collection: Greywater and blackwater are collected and sent to nearby sewers or onsite sanitation systems.

5. Conveyance:
    - Offsite System: Consists of sewage conveyance and treatment at STPs, including interception and diversion drains and sewer networks.
    - Onsite System: Includes privately owned and maintained sewage disposal systems, such as septic tanks with soak pits.

6. Treatment: Sewage is treated in STPs and faecal sludge can be treated at STPs, STP-cum-FSTPs or standalone FSTPs, either centralized or decentralized.

7. Recycle/Disposal: Treated used water can be reused for non-potable purposes, agriculture, horticulture, industrial purposes, municipal purposes or water body rejuvenation.

8. User Fees: Suitable user fees should be levied to recover operational and maintenance costs, ensuring long-term sustainability and service delivery.

Table 1: Summarized Details of Sewage Treatment Plants in Bilaspur, Bhilai and Raipur

STP	Location	Capacity	Technology	Site Area	CapEx	OpEx	Energy Expenditure
STP 1	Domuhani, Bilaspur	54 MLD	Activated Sludge Process (ASP)	6.5 acres	Rs. 40.18 crore	Rs. 65 lakh p.a.	Rs. 9 lakh/ month
STP 2	Chilhati, Bilaspur	17 MLD	Activated Sludge Process (ASP)	16.48 acres	Rs. 16.80 crore	Rs. 53.21 lakh p.a.	Rs. 2.5 lakh/ month
STP 3	Bhilai Steel Plant	30 MLD	-	7.41 acres	Rs. 28.11 crore	Rs. 2 crore p.a.	-
STP 4	Chandandih, Raipur	75 MLD	Sequential Batch Reactor (SBR)	22.15 acres	Rs. 67.28 crore	Rs. 246 lakh p.a.	Rs. 30—35 lakh/ month
STP 5	Kara, Raipur	35 MLD	Sequential Batch Reactor (SBR)	5.01 acres	Rs. 31.39 crore	Rs. 205 lakh p.a.	Rs. 20—22 lakh/ month
STP 6	Nimora, Raipur	90 MLD	Sequential Batch Reactor (SBR)	10.27 acres	Rs. 80.72 crore	Rs. 246 lakh p.a.	Rs. 50—52 lakh/ month

Sanitation workers with technical support unit in Chhattisgarh

Technology Options

The state developed a technology catalogue to guide ULBs. The catalogue presents a range of technology options for used water treatment, including conventional technologies like Activated Sludge Process (ASP), Sequential Batch Reactor (SBR) and nature-based solutions such as Constructed Wetlands, Phytorid Technology and Decentralized Wastewater Treatment Systems (DEWATS). These technologies vary in terms of their treatment capacity, land requirements, capital and operational costs and energy requirements.

Table 2: Comparison of Conventional and Nature-Based Technologies for Used Water Treatment

Technology	Land Requirement (Ha/MLD)	Capital Cost (INR Lakh/MLD)	O&M Cost (INR Lakh/MLD)	Energy Requirement (kWh/ML treated)
Activated Sludge Process (ASP)	0.15—0.25	80—170	6.0—10.0	180—225
Sequential Batch Reactor (SBR)	0.10—0.15	150—300	10.0—20.0	150—200
Waste Stabilization Ponds (WSP)	0.5—1.0	30—60	0.6—2.5	Negligible
Root Zone Aeration/ Constructed Wetland	0.6—1.5	30—150	1.2—3.0	Negligible
Decentralized Treatment System (DTS/DEWATS)	0.13—0.14	80—200	2.0—2.5	Negligible

The catalogue provides information on technology providers offering innovative solutions for used water treatment, such as the Anaerobic Membrane Bioreactor (AnMBR) by the University of South Florida, Aerated Wetland Sewage Treatment Plants by BlueDrop Enviro Pvt. Ltd. and Advanced Soil Biotechnology by Vision Earthcare Pvt. Ltd. These technologies offer advantages like small footprints, high treatment efficiency, resource recovery and low energy requirements.

Conclusion

The catalogue aims to serve as a valuable resource for ULBs and the State Urban Development Agency (SUDA) in Chhattisgarh by providing guidance on suitable technology options for used water management. By considering factors such as land availability, treatment capacity requirements, capital and operational costs and energy consumption, ULBs can evaluate and select the most appropriate technology or combination of technologies for their specific contexts.

It is recommended that ULBs engage technical experts and conduct pilot testing to assess the applicability and performance of the proposed solutions before implementing them on a larger scale. Additionally, integrating a five-year operation and maintenance plan into the contracts can ensure consistent performance and sustainability of the chosen technologies.

The adoption of cost-effective and nature-based solutions for used water management can help smaller ULBs in Chhattisgarh overcome the challenges of limited resources and technical expertise while promoting sustainable and efficient management of used water and faecal sludge.

D 3: Chhattisgarh's Faecal Sludge and Used Water Quality Analysis Plan

Introduction

The Chhattisgarh Urban Faecal Sludge (FS) Used Water Treatment Quality Analysis Plan marks a significant milestone in the state's endeavour to enhance public health and environmental sustainability. Rooted in the Swachh Bharat Mission (SBM) initiated in 2014, which aimed to eradicate open defecation and improve solid waste management, this quality monitoring plan represents a crucial step in advancing the state towards achieving the Sustainable Development Goals (SDGs).

Context

SBM was launched in the year 2014 to eliminate open defecation and improve solid waste management. In the first phase, it had aimed to achieve 100 per cent ODF status for urban and rural areas by 2 October 2019.

The second phase of SBM (SBM 2.0) emphasizes the sustenance of Open Defecation Free (ODF) status and the improvement of solid and liquid waste management. Targeting SDG 6.2, which focuses on ensuring access to adequate and equitable sanitation and hygiene for all, the mission underscores the vital role of proper treatment processes in safeguarding public health and the environment.

Used water (UW) management in Chhattisgarh

There are 11 sewage treatment plants (STPs) in Chhattisgarh currently, with no city having full sewerage coverage. To address faecal sludge treatment, the state has developed:

- 156 constructed wetland-type FSTPs (providing primary treatment).
- 9 sewage treatment plants under construction.

The state plans to implement full-fledged FSTPs with resource recovery in five pilot ULBs using affordable and scalable technologies like:

- Planted drying beds
- Unplanted drying beds
- Membrane bioreactors

This highlights the urgent need for a comprehensive monitoring protocol for treated water and faecal sludge quality in Chhattisgarh.

Nimora STP, Raipur

Policy and Regulatory Framework

As per Seventh Schedule of the Indian constitution, 'water' is a state subject. However, the 74th Constitutional Amendment decentralizes water supply and sanitation services to urban local bodies (ULBs). There is no specific Act dedicated to wastewater management, but several policies and regulations govern this activity:

The Water (Prevention and Control of Pollution) Act, 1977 deals with wastewater as a source of pollution. The Central and State Pollution Control Boards prescribed Water Quality Standards and Effluent Standards under this Act.

The Environment (Protection) Act, 1986 empowered the Central Government to prescribe standards for sewage/effluent and ensure compliance. The Environment Protection Rules, 1989 prescribe industry-specific standards.

The National Environment Policy, 2006 emphasizes preventing water pollution and recycling/reuse of wastewater.

The National Urban Sanitation Policy, 2008 recommends recycle and reuse of wastewater for non-potable applications.

India's National Water Policy, 2012 incentivizes decentralized sewage treatment and reuse of treated wastewater.

The National Faecal Sludge and Septage Management Policy, 2017 mandates strict environmental discharge standards and promotes safe disposal of faecal waste.

Other Key Policies/Regulations

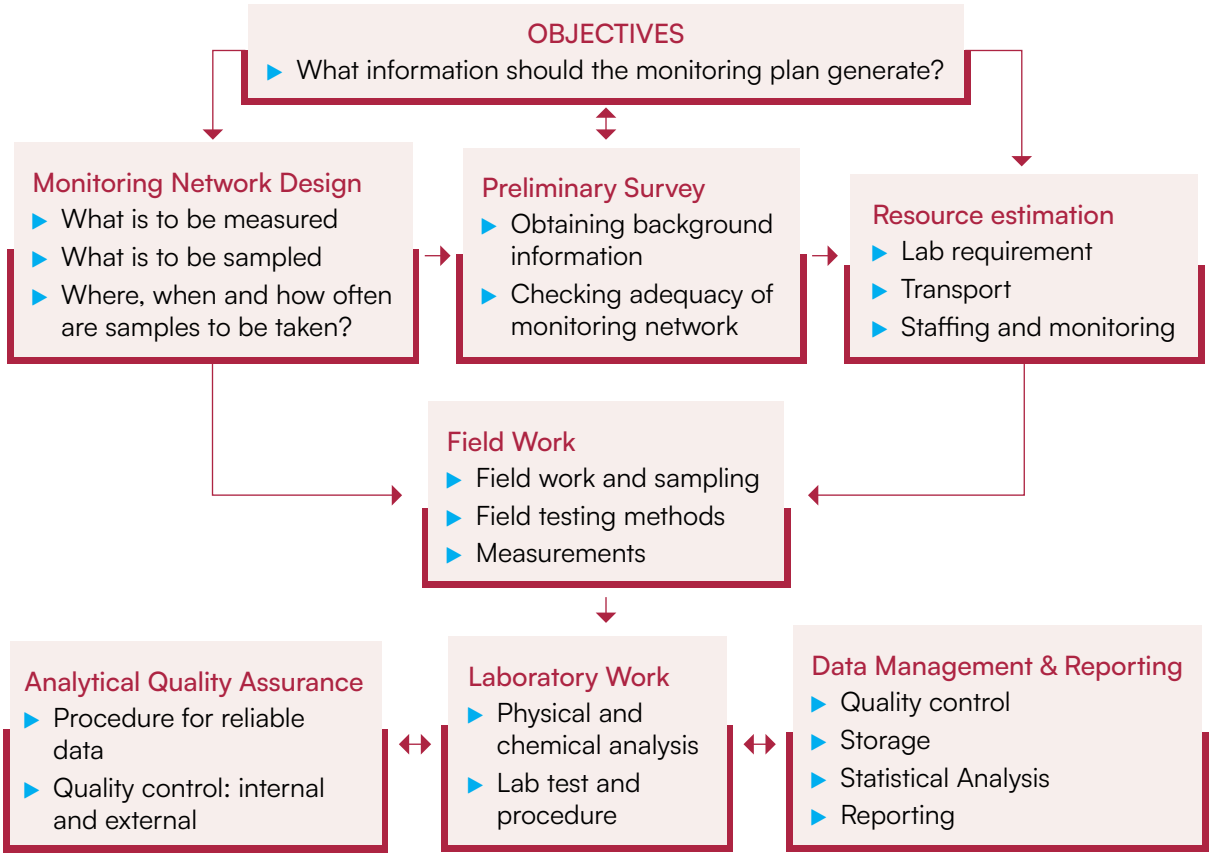
- The Model Bill for Groundwater Regulation (2016)
- Prohibition of Employment as Manual Scavengers Act (2013)
- Coastal Regulation Zone Notification
- National Water Quality Monitoring Programme
- National Building Code (2016) on reuse of treated wastewater
- National Guidelines on Zero Liquid Discharge (CPCB)

This policy and regulatory framework govern the discharge standards, treatment requirements and safe disposal/reuse of treated wastewater and faecal sludge.

Used Water and Faecal Sludge Quality Monitoring Strategy

1. Setting monitoring objectives.
2. Assessing available resources (labs, manpower, equipment).
3. Designing the monitoring network.
4. Sampling and field testing.
5. Laboratory analysis.
6. Data management and reporting.
7. Quality assurance and control.

Against this backdrop, the Technical Support Unit (TSU) submitted a monitoring methodology to the state of Chhattisgarh for approval. The methodology for supervising water and faecal sludge quality can be succinctly summarized as follows:



Steps to Monitor Used Water and Faecal Sludge Quality

STEP 1

- Setting objective for monitoring UW and FS

STEP 2 Assessment of resource availability

- Laboratory facilities and competence
- Transport
- Manpower - Competent and adequate in number

STEP 3 Network design

- Selection of sampling locations
- Optimum number of locations
- Parameters to be measured
- Frequency of sampling
- Component to be sampled - wastewater, dried sludge, faecal sludge

STEP 4 Sampling

- Representative
- Sampling
- Field testing
- Sample preservation and transport

STEP 5 Laboratory work

- Laboratory procedures
- Physical and chemical analysis
- Microbiological and biological analysis

STEP 6 Data management

- Production of reliable data
- Quality control: internal and Quality control
- Internal AQC
- External AQC

STEP 7 Quality Assurance

- Production of reliable data
- Quality control: internal and Quality control
- Internal AQC
- External AQC

Sampling and Analytical Protocols

Proper sampling, transportation and testing methods are critical for reliable results. Key protocols include:

- Representative sampling techniques.
- Preserving samples during transport.
- Testing for physical, chemical and biological parameters.
- Quality assurance and control measures.

The Main Analytical Parameters for Used Water/ Faecal Sludge Include:

Parameter	Importance
Solids Content	Indicates organic/inorganic matter
BOD/COD	Measure oxygen demand
Nutrients (N,P)	Essential for biological treatment
Pathogens	Indicate health risk
Heavy Metals	Potential toxicity

Treatment Standards

The plan prescribes standards that treated effluent and biosolids from FSTPs must meet.

Treated Effluent Standards

PARAMETER	Limit
PH	6.5—9.0
BOD	<30 mg/L
TSS	<100 mg/L
Faecal coliform	<1000 MPN/100mL

BOD, biological oxygen demand; TSS, total suspended solids

Biosolids Standards

- Pathogen reduction: <1000 MPN Escherichia coli/g total solids (TS) or <1,000 CFU faecal coliform/g TS.
- Vector attraction reduction: Volatile solids <40 per cent TS.
- Heavy metal limits: Ceiling concentrations for As, Cd, Cr, Cu, Pb, Hg, Ni, Zn.
- General criteria: No odour, partially treated biosolids transported to be vector reduced.

Reporting and Institutional Roles

- FSTPs to maintain process logs and undertake periodic sampling/testing.
- ULBs to ensure compliance, take corrective actions and collaborate with experts.
- State agencies (State Urban Development Agency (SUDA), Pollution Control Board (PCB)) to provide guidance, build capacity and monitor implementation.
- Option to partner with accredited private labs for testing services.

Institutional Framework

The SUDA and Mission Directorate (SBM(U)) are vested with the overall responsibility for establishing state laboratories or collaborating with accredited labs for used water and faecal sludge testing.

Other Key Institutional Roles

STATE POLLUTION CONTROL BOARD	▶ Coordinate with ULBs on monitoring activities. ▶ Enforce standards.
URBAN LOCAL BODIES	▶ Ensure regular testing as per protocols. ▶ Train and certify STP/ FSTP operators. ▶ Retrofit/upgrade treatment systems based on test results.

ACADEMIC/ RESEARCH INSTITUTES	▶ Provide research and technical expertise. ▶ Assess the effectiveness of the monitoring programmes.
STP/FSTP OPERATORS	▶ Collect and test samples as per standard operating procedures (SOPs). ▶ Maintain testing logs.
ENGINEERS/ MUNICIPAL COMMISSIONERS	▶ Prepare monitoring plans. ▶ Ensure compliance and take corrective actions. ▶ Allocate funds for regular monitoring.

Public–private Partnerships and Other Possibilities

Setting up new government laboratories may entail high investments and cause delays. The state can explore public-private partnerships (PPPs) by doing the following:

- Collaborating with NABL/ISO accredited private labs as 'support organizations'.
- Engaging with labs of other agencies like Pollution Control Boards.
- Promoting entrepreneurship for testing services.
- Utilizing labs at colleges and universities by paying a fee for services.

This can help the Chhattisgarh government access the existing capabilities, infrastructure and human resources of private labs in a timely and cost-effective manner.

Conclusion

The Chhattisgarh Urban Faecal Sludge Used Water Treatment Quality Analysis Plan serves as a comprehensive blueprint for monitoring the quality of treated effluents and biosolids. A consistent implementation of the plan will not only maximize public health and bestow environmental benefits but also pave the way for sustainable urban sanitation practices. Leveraging technology, building skilled manpower and fostering partnerships with accredited labs and institutes will be imperative in realizing the plan's objectives and ensuring a cleaner, healthier future for urban Chhattisgarh.

Sanitation worker collecting water sample for treatment

D 4. FSSM in Jharkhand: Selecting Suitable Technologies and Moving towards Energy Neutrality

Jharkhand is progressing from being ODF (Open Defecation Free) to ODF+ and ODF++. The State Urban Development Agency (SUDA), functioning under the Urban Development and Housing Department (UDHD), plans to equip all urban local bodies (ULBs) with Faecal Sludge Treatment Plants (FSTPs) and Sewage Treatment Plants (STPs) for septage and sewerage treatment. Jharkhand has 49 ULBs, of which 39 ULBs have already finalized plans for the installation of FSTPs to treat faecal sludge (septage). In an effort to accelerate the Faecal Sludge and Septage Management (FSSM) in Jharkhand, a Technical Support Unit (TSU) was established by UNICEF as part of SUDA in 2021. The role of TSU was broadly to provide handholding support in the finalization of Detailed Project Reports (DPRs) and technical support along with information, education and communication (IEC) and behaviour change communication (BCC) activities and adoption of nature-based technologies. Earlier, Jharkhand had majorly adopted electromechanical technologies under Atal Mission for Rejuvenation and Urban Transformation (AMRUT) projects, which was studied by the TSU team, and a case was developed for SUDA. A detailed discussion on electromechanical technologies and the alternatives provided by nature-based technologies took place between all the stakeholders like SUDA, JUIDCO and the technical cell of UDHD. It was concluded that considering Jharkhand's context, nature-based technologies offer a very suitable alternative

Site visit at Bundu FSTP

Sludge collecting vehicle entering the FSTP

to the electromechanical-based options. This decision was guided by the comparison of CapEx (Capital Cost), OpEx (Operational Cost for five years) and the carbon footprint. For all the three parameters, nature-based technologies offered a very cost-effective and environment-friendly option. Therefore, it was decided that the state will adopt nature-based technologies in all the upcoming FSTPs and finally, out of 39 FSTPs, 35 FSTPs are planned to be constructed on nature-based technologies.

With this approach, Jharkhand is able to reduce the project cost of FSTPs by 20—25 per cent (CapEx and OpEx) along with taking steps towards environment-friendly sanitation. The use of solar driers for the drying of the sludge, which forms a significant component of the faecal sludge, holds a significant economic potential as the dried sludge can be used as a soil conditioner or in co-composting. Hence, it becomes important to treat the sludge to the highest possible degree. Hence, the use of solar driers that utilizes solar power (Jharkhand, being close to the Tropic of Cancer, which passes through Ranchi, the capital of Jharkhand, has a higher intensity of solar energy) was proposed to raise the temperature of the dried sludge during its treatment. This not only increased the reuse potential of dried sludge but also reduced the infrastructure costs. In general, the drying time of green house solar driers (GHSDs) is at least 50 per cent lower than galvanized iron (GI) roofs. The primary reason for the reduction in drying time is the effect that GHSDs have on increasing the temperature within the GHSD area, which increases the moisture-holding capacity, thereby lowering the relative humidity within the roofing system. Consequently, temperatures inside the GHSDs can be 15°C higher than the ambient temperature during peak hours (between 11 a.m. and 3 p.m.) and on an average 7—8°C higher than the ambient temperature throughout the day. Thus, this methodology can help in handling more faecal

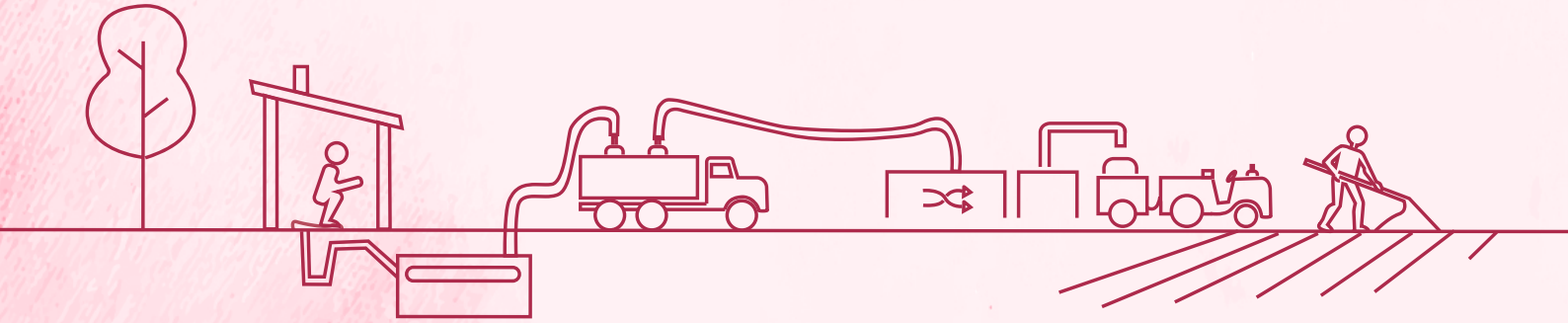
sludge in an existing unplanted drying bed or reducing the number of unplanted drying beds. In case of Jharkhand, earlier 12 unplanted drying beds were proposed, whereas, after the use of GHSDs, the number of beds have been reduced to nine. GHSDs adopted in the selected ULBs is estimated to help in the reduction of the CapEx by approximately 10 per cent. Hence, this intervention has helped in cost optimization along with the expected impetus to circular economy by increasing the reuse potential of the dried sludge. Currently, this provision has been added in four DPRs and is expected to be replicated in other upcoming FSTPs.

It was decided to take this journey of sustainability a step forward by making FSTPs energy-neutral guided by SDG 7, which aims for access to affordable and clean energy. Hence, the TSU team again advocated with the SUDA and other stakeholders and finally helped the agency adopt this approach. The identified FSTPs were analysed and their energy requirement was minimized. Further, suitable areas were identified to install the solar panels. Hence, the TSU team, along with the DPR consultant, was successful in making the FSTPs energy-neutral, which could even become energy-surplus during the operations. This has helped not only in contributed towards bringing down Nationally Determined Contributions (NDCs) but also in lowering the operational cost of FSTPs. Currently, the provision for energy neutrality has been added to four FSTPs and is expected to be replicated in other upcoming FSTPs. Hence, considering all the interventions, it is expected that these FSTPs shall provide sustainable sanitation to citizens in an eco-friendly manner where the methodology guided by nature would reap environmental benefits and FSSM in Jharkhand will move towards sustainable sanitation.

FSTP at Bundu

E

IEC AND CAPACITY BUILDING



E 1: Bridging the Gap in Faecal Sludge Management: Insights from a 15-Day Campaign in Bundu Nagar Panchayat and Giridih Nagar Nigam, Jharkhand

Introduction

From 1—15 March 2024, an extensive Information, Education, and Communication (IEC) and Behaviour Change Communication (BCC) campaign was carried out in Bundu Nagar panchayat and Giridih Nagar nigam together. This initiative was spearheaded by the Technical Support Unit (TSU) in collaboration with the State Urban Development Agency (SUDA) of Jharkhand. The concerned ULBs collaborated with the partner organization NEED, with the aim of raising awareness about Faecal Sludge and Septage Management (FSSM) and promoting safe sanitation practices.

Campaign Activities

Awareness Programmes

A variety of IEC activities were implemented across different wards and public areas to disseminate messages on safe sanitation practices. Key activities included the following:

- **Nukkad Natak:** Street plays were performed to highlight the importance of proper faecal sludge management and the health hazards associated with its improper disposal. The performances by the Shiv Shakti Nukud Natak group, featuring actors in Malasur costumes, were staged in central locations like Majhi Toli and children's parks to maximize community engagement.

Various IEC campaign activities in Jharkhand

Communication on FSSM

- **Wall and Vehicle Paintings:** Artistic depictions and key messages were painted on walls and cesspool vehicles, spreading awareness about scheduled desludging and proper disposal practices.
- **Swachhata Rath:** A mobile vehicle equipped with audio messages and educational materials toured the regions, promoting FSSM practices. This initiative was flagged off by the local Member of the Legislative Assembly (MLA) of Tamar and covered all the 13 wards in Bundu and 36 wards in Giridih, emphasizing the importance of regular desludging. The toll-free number of the urban local body (ULB) was also prominently displayed in these vehicles.

Mal Danav: As part of this campaign, the toll-free number was displayed in ULB-owned vacuum tankers and walls were painted with Mal Danav messages at various key locations within Bundu and Giridih. These messages were

Mobile vans used for community outreach

Mobile vans in action for community outreach

strategically displayed at various residential and commercial locations of the city.

Community Engagement

Efforts were made to engage various community groups to ensure widespread dissemination of the campaign messages:

- **Low-Income Settlements:** Direct engagements were conducted to sensitize residents about the benefits of proper FSSM practices.
- **Sanitation Workers:** Workshops and training sessions were organized to educate sanitation workers about the NAMASTEY scheme, which focuses on the rehabilitation of manual scavengers. The training also covered the use of personal protective equipment (PPE) and occupational health and safety measures.
- **Self-Help Groups (SHGs):** Workshops were held to involve SHGs in sanitation improvement efforts, providing them with opportunities for dignified livelihoods in sanitation service delivery. These workshops

Capacity building of SHGs

Capacity building of SHGs

were supported by the National Urban Livelihoods Mission (NULM) and aimed to explore business opportunities in the FSSM value chain.

School Programmes

School children from Rajendra Ashram Kanya Vidyalaya were oriented on water, sanitation and hygiene (WASH) and the concept of Malasur, the demon formed from mismanaged faecal sludge. A total of 78 students were encouraged to contribute to preventing water contamination and promoting safe sanitation practices in their communities.

Key Messages

The campaign communicated three critical messages to the community:

- **Containment:** Ensure the construction of proper toilet facilities.

Awareness campaign on WASH in Jharkhand schools

- **Desludging:** Schedule desludging activities every three years using licensed operators.
- **Disposal:** Verify that desludgers dispose of faecal sludge at the designated sites and report unauthorized dumping.

Conclusion and Way Forward

The 15-day IEC/BCC campaign successfully raised awareness about the importance of FSSM and promoted safe sanitation practices in Bundu and Giridih. Moving forward, TSU-UNICEF, in collaboration with local authorities, plans to extend these efforts to rural areas through an 'urban—rural convergence' initiative. This initiative aims to utilize the existing urban FSM infrastructure to serve adjacent rural communities, thereby reducing environmental pollution and health risks associated with unsafe faecal waste management.

By fostering collaboration between urban and rural areas and leveraging existing resources, the initiative seeks to create a sustainable model for comprehensive faecal sludge management across the district, contributing to the overall health and well-being of the communities involved.

E 2: Transforming Sanitation Infrastructure: A Community-Led Initiative in Nagaon, Assam

Introduction

Assam needed not only systems for desludging of septic tanks but also to work on toilet usage. Here is the story of how a city in Assam sprung into action to make the community toilet usable.

This was possible due to the Faecal Sludge and Septage Management (FSSM) project in Assam in March 2021 by UNICEF in partnership with the Bill and Melinda Gates Foundation (BMGF) and the Women Development Centre (WDC), the local non-governmental organization (NGO).

Garbage dumping site

Garbage site being cleared

Nagaon is the second largest city in the state of Assam. Nagaon Municipal Board (NMB) is divided into 26 wards and the city has a population of 1,17,722. The total number of households is 16,989, out of which the slum population is 9.17 per cent. In this city, there is one community toilet and 12 public toilets besides household toilets. The single community toilet built as part of Swachh Bharat Mission (Urban) (SBM (U)) is used by 50 households of a community. Unfortunately, the area around the toilet became a dumping zone for garbage. The toilet was damaged and not used or maintained properly for a long time.

Transformation of the Area and the Community Toilet

The WDC team visited the Harijan Colony to assess the situation and FSSM practices. A meeting was held with Ward Commissioners of ward no. 11 and 18. They were trained on FSSM by the Technical Support Unit (TSU) of UNICEF. The discussions motivated the Ward Commissioners to take action. For one whole month, the WDC and the Ward Commissioners engaged in creating awareness among the residents to stop dumping the waste in front of the community toilet. They were also oriented on the ill-effects of inappropriate waste management and the need for handing over the waste to NMB garbage collection vehicles. The issue was also taken up by the Vice Chairman, Mr. Simanta Borah. He took action by arranging the vehicles required to clean up the area. As a result, on 3 June 2023, the Ward Commissioner of ward no. 11 successfully cleaned the garbage zone in front of the toilet and conducted a tree

Discussion with households.

plantation drive in the cleared zone. A total of 50 trees were planted by the community at the dumping site, changing the whole view of the site. The community toilet was repaired and the septic tank was also desludged. The inhabitants of the place are now happy.

Changes and Learnings

- Many people were not aware of handling and disposal of solid waste and safe sanitation practices. However, after the WDC team and the Ward Commissioner oriented them, they took the initiative to maintain the cleanliness of the dumping area and the community toilet.
- Around 50 households of the colony and the Ward Commissioners are now aware of the key messages of FSSM, such as building the right kind of septic tank and using safety gear during desludging (because people are also involved in desludging operations).
- The active involvement and leadership of the Ward Commissioners and NMB officials helped. The initiative taken by the Ward Commissioner to clean the garbage zone and conduct a tree plantation drive reflects a commitment to improving sanitation and consciousness about environmental sustainability.
- Engaging communities and empowering local leaders are crucial for sustainable environmental initiatives.
- Increased information, education and communication (IEC) initiatives and capacity building on FSSM and sanitation and monitoring systems by the Government can be very helpful for taking action to improve the use of toilets and overall sanitation near dwelling areas.

Site improved after removing garbage

E 3: Mobilizing Self-Help Groups (SHGs) for Communicating about Faecal Sludge and Septage Management (FSSM) Practices in Pithampur, Madhya Pradesh

"Vishwas dilwana itna aasan nahi hai"
("It is not easy to make them believe")

— Rashmi Rajput

This simple statement demonstrates the main challenge faced by volunteers and mobilizers while reaching out to communities for facilitating practices related to desludging and emptying of pits. Rashmi Rajput, a self-help group (SHG) member for two years and a member of the Mohalla Sabha in Pithampur, was driven to ensure that she and her community lived in a clean environment when UNICEF initiated the Faecal Sludge and Septage Management (FSSM) interventions in her urban local body (ULB).

Rashmi Rajput, SHG Member and Mohalla Sabha Member

UNICEF-supported FSSM project intervention in Madhya Pradesh aims to support urban development authorities in Budhni and Pithampur ULBs to create awareness and demand for FSSM and improve the existing services to meet that demand. As urbanization has increased, sustainable sanitation measures across cities have come under immense pressure, requiring all households not connected to sewer systems to have proper onsite FSSM processes. These include containment (i.e., toilet with technically correct septic tank), collection (regular emptying of septic tank), transportation (of sludge safely to a treatment plant), treatment and reuse. The project's overall goal was to support the Urban Development and Housing Department (UDHD) at the State level to strengthen the overall value chain for FSSM, learning lessons from piloting in these two ULBs ranging from improved planning and management to technological interventions for FSSM services. Integral to the initiative was the planning and execution of the FSSM Social and Behaviour Change Communication (SBCC) interventions, which were developed by UNICEF Water, Sanitation and Hygiene (WASH) Madhya Pradesh team and implemented by Pithampur municipality with support from WaterAid India.

A Brief Profile of Pithampur

Pithampur, located in the Dhar district of Madhya Pradesh, falls within the suburban limits of the Indore metropolitan region. The town serves as the industrial hub for Indore and is primarily inhabited by migrant workers. A baseline study conducted for this FSSM initiative revealed that 831 households in Pithampur had access to operational toilets. However, the town of Pithampur faced severe challenges of indiscriminate disposal of partially treated wastewater into drains and water bodies, which

resulted in pollution of the environment. Dried sludge (partially treated) could be seen out in the open. The lack of proper toilet technology adoption resulted in large excreta containment units, which conflicted with the norms of IS 2470.

"The residents of the town owned household toilets but maintaining them was not a priority. The households did not possess any knowledge about wastewater contamination and were not accepting sewer line connections," said Rashmi Rajput. The limited support provided by the Nagar Palika led to scepticism among the community, which was evident when the implementation team approached the communities for undertaking the timely emptying of their septic tanks. However, the situation witnessed a positive change over a period of time with the engagement and mobilization of women from the ULB. These women emerged as champions and leaders in promoting safe sanitation, providing correct information and influencing households to adopt correct practices.

This change was largely due to the effective Social and Behaviour Change Communication (SBCC) strategy developed and implemented in the ULB. A methodological approach was adopted for devising a localized behaviour change communication strategy for Pithampur, based on evidence generated from the field.

Situation Analysis for FSSM in Pithampur

Following a structured approach to developing an SBCC strategy, the team initiated a desk review for a quick sanitation situation assessment for the town of Pithampur. Following the review, in-depth interviews and focus group discussions (FGDs) were conducted with households (HHs), commercial centres and institutional building managers, public and community toilet caretakers and desludging operators. These interviews and FGDs helped in gathering evidence on knowledge, attitudes and practices on FSSM in Pithampur. FGDs and consultations led to the collection of baseline findings to understand the perceptions of the target audience and practices on FFSM such as the quality and quantity of faecal sludge generated, collection methodologies, transportation methods, treatment technologies and efficacy of the overall FSSM services in Pithampur. It also helped identify the key behaviours to be prioritized by different stakeholders and channels of communication that could be used to reach them.

Brief Highlights on the Findings of the Situation Analysis

Highlights of current practices and barriers at various levels

Stakeholders	Current practices	Barriers
Household-level		
Households (HHs) — individuals and families	• HHs facing containment tank overflow issues. • Regular desludging missing. • Unable to undertake desludging due to narrow lanes and approach. • Below poverty line (BPL) HHs not willing to pay the desludging fees of Rs. 1,000, despite facing containment overflow issues.	• Cost of retrofitting of the toilets. • Lack of knowledge » Communities unaware of the importance of desludging and how faecal sludge is contaminating the water bodies. » Unaware of the health and sanitation benefits of desludging the containment tanks every three years. » Desludging machine unable to access homes for pit-emptying due to narrow lanes and streets. » Cost of desludging.

(Continued)

(Continued)

Stakeholders	Current practices	Barriers
HHs with private sewage lines in some private colony	• Unaware of where the faecal sludge is being discharged. • No or limited knowledge about location of containment unit and its maintenance.	• Lack of knowledge » Non-availability of a blueprint of the sewer lines and tanks of the society
Service providers		
Masons	• Undertaking faulty construction of septic tanks. • Constructing big tanks • Not maintaining 30 meters distance from boreholes and hand pumps.	• Lack of knowledge. • Lack of space.
Desludging operators	• Not following safety precautions. • Not using safety gear. • HHs reported that Municipal Corporation's desludging operator did not completely desludge the septic tank.	• Non-availability of personal protection equipment (PPE) kits. • Lack of knowledge of procedures. • The size of the containment tanks is big and more trips for desludging means more fees.
Motivators	Self-help groups (SHGs) of more than 350 women formed under the National Urban Livelihood Mission (NULM) not engaging in discussions on desludging or emptying pits. Mohalla Samitis in different wards not supporting the cause. Teachers and students in schools and colleges are unaware of the issue.	• Lack of knowledge on the issues of irregular desludging or unsafe discharge of faecal sludge. • No communication material was developed for raising awareness. • Missing capacities to effectively use the communication material.
Policymakers / government / institutions	• Lack of priority for desludging of septic tanks. • No activities are planned to increase demand for desludging the septic tanks, once every three years.	• A separate record of individual HHs applying for desludging is not maintained. • IEC Agency staff is not trained to conduct information, communication and education/ social behaviour change (IEC/BCC) or social behaviour change and communication (SBCC) activities in a planned and effective way.

The situation analysis revealed the possibility of engaging SHG members, Mohalla Samiti members and students as motivators at the HH level and trade associations as motivators for mobilizing commercial establishments. Along with identifying key motivators, a channel analysis was undertaken, which identified the key audiences and multiple channels, including print media, mid-media, interpersonal communication (IPC), interactive community theatre, audio-video materials and social media, through which various audiences could be mobilized.

Competitions and awareness generation rallies and capacity-building initiatives for SHG members and Mohalla Samiti members, MC members, Faecal Sludge Treatment Plan (FSTP) staff were undertaken to develop their soft skills. Based on these findings, a comprehensive SBCC strategy was devised to guide interventions and communication materials developed to implement the strategy.

Behaviour Change Communication Model for Mobilizing Communities

The two-fold communication strategy devised focused on mass mobilization through Malasur Campaign and targeted interpersonal communication (IPC) with households and key stakeholders. To facilitate interpersonal

communication, various stakeholders such as SHGs, service providers and ULB staff were trained to provide key messages and initiate dialogue within the community.

The key objectives of the SBCC strategy were as follows:

- Increase HHs' knowledge on water contamination issues and why septic tanks have to be desludged once in three years.
- Increase awareness about the linkage between water contamination and health among the HHs.
- Increase the number of HHs desludging their septic tanks.

A mascot was designed for the National-Level Malasur campaign on FSSM. It was adapted for Pithampur and rolled out. IEC materials like brochures, posters, leaflets and wall writings were developed and rolled out in six wards. Localized jingles, interactive community theatres, folk media, student rallies and social media campaigns also provided a 360-degree coverage.

Malasur campaign

Mobilizing the women community through the Malasur campaign

Mobilizing SHGs for Implementing FSSM at Pithampur

A participatory approach was adopted for mobilizing and engaging communities. SHG members were engaged first, following which they took the onus and increased the demand for practising safe FSSM. Though implementation of FSSM at the ULB level has been a challenging task yet, women like Rashmi Rajput have emerged as champions. Taking the responsibility of making her ULB clean and safe, Rashmi was among the first few who tried to mobilize the community for undertaking desludging and safe disposal of black water. Despite facing resistance in the initial stages of community mobilization, where people were not ready to listen to the members of the Mohalla Samitis and further refused to pay for the desludging charges for maintaining the tanks, she continued with her work. The constant nudging by the Mohalla Samiti combined with a localized and effective SBCC strategy proved highly effective.

Results and Outcomes

The Mohalla Samiti formed under the project is now actively engaged in generating awareness about the maintenance of toilets, routine cleaning of septic tanks, handwashing with soap and segregation of waste. Another crucial outcome is the resolution passed by the ULB offering 20 per cent discount on desludging costs in case of group demands of 10 or more households raised by the Mohalla Samitis, SHG or any other community groups.

This has also led to a significant increase in demand for desludging services. The Mohalla Samitis were able to convince communities to take up responsibility and accountability for desludging and emptying their tanks. Issues like lack of political will at the local level for prioritizing desludging and emptying of tanks persist; however, improved capacities through capacity building of volunteers and women motivators have helped in creating awareness and generating better vigilance of the situation at the ULB level. Despite being at the early stage of implementation, the project has witnessed a bottom-up approach, resulting in higher levels of accountability and ownership at the grassroots level. Through constant support from the technical unit of WaterAid India and Nagar Palika, the communities have been effectively mobilized, where women like Rashmi have played a pivotal role in implementing FSSM and creating demand for desludging and emptying tanks.

Advocacy with the State Government Based on the Pilot for Scaling Up of Mohalla Samiti in Other ULBs

After the mobilization of the SHGs and Mohalla Samiti, a state-level workshop was organized in December 2022 to disseminate the learnings from the interventions undertaken in Pithampur and Budhni for implementing Citywide Inclusive Sanitation (CWIS). The workshop was attended by key officials responsible for implementing FSSM and undertaking CWIS. Following this workshop, it was agreed to intensify Mohalla Samiti's engagement in other ULBs for scaling up CWIS across the State.

Glimpse of Mohalla Samiti meeting

E 4: Swachhata Hi Seva: Promoting Cleanliness and Hygiene in Jharkhand

Under the Swachhata Pakhwada initiative, the Government of Jharkhand had initiated 'Swachhata Hi Seva' (SHS) Campaign from 15 September 2023 to 2 October 2023 across the State. Different activities were undertaken during this campaign. Officers in the urban local bodies (ULBs) were assigned to visit respective wards/areas and oversee the implementation of activities to reinforce the concept of 'Sanitation as everyone's business' as a prelude to the Swachh Bharat Diwas (2 October), which was celebrated statewide.

Key Activities Organized Under SHS-2023

The theme of SHS 2023 was 'Garbage Free India' with focus on visual cleanliness and welfare of Safai Mitras. Like earlier years, the spirit of cleanliness activities was voluntarism (shramdaan). The focus of these swachhata drives was on high footfall public places like bus stands, railway stations, cantonment boards, beaches, tourist places, historical monuments, heritage sites, river fronts, ghats, drains and nallahs.

Swachhata Hi Seva: Fortnight Long Cleanliness Drives

Throughout the State, collective effort was made to combat waste through extensive cleaning campaigns and the implementation of innovative methods to promote 'twin bin' systems and source segregation. As part of the Swachhata Hi Seva (SHS) 2023 initiative, local bodies orchestrated large-scale cleanliness initiatives across various sites in Jharkhand, including the cleansing of water bodies, streets, public institutions, bustling markets, bus stands and popular tourist destinations.

At the municipal level, solemn oaths were taken to achieve the vision of a 'Garbage-Free India', accompanied by spirited cleanliness rallies involving office personnel, women's self-help groups and the general population. Emphasizing the importance of civic responsibility, a call was issued to the public, particularly the youth, to embrace the role of 'Cleanliness Warriors' and actively promote awareness of sanitation practices.

In addition to these efforts, a range of engaging events were organized at the local level, including debates, song contests, dance performances, waste-to-craft exhibitions, art displays, group dances and drawing competitions in schools. Street plays (Nukkad Natak) were also staged to raise awareness about the significance of recycling and reusing waste materials, further fostering a culture of sustainability within ULBs.

Indian Swachhata League 2.0

This initiative is geared towards mobilizing large-scale youth groups to actively embrace and take lasting responsibility for cleanliness and hygiene in areas like tourist destinations. The Swachhata League served as a catalyst, inspiring young individuals within cities to proactively contribute to the vision of creating garbage-free urban areas, aligning with the goals of the Swachh Bharat Mission. All 49 ULB teams were competitively engaged for making their city or town 'garbage-free' on 17 September through

Cycle rallies on FSSM

SafaiMitra Suraksha Shivir, MP

youth-led citizen teams.

Special guest Mohit Niranjan participated in the awareness programme of ISL 2.0 through a cyclothon. Mohit rode a cycle from Lalitpur, Uttar Pradesh, covering 30,000 km across different States and prominent places to unite and make people aware of sanitation. Jharkhand was the 10th state for him.

One unique initiative was when students and some residents of Latehar distributed 155 hand soaps and 20 sanitary napkins to girls of the Government Higher Secondary School in Chandwa. The move was a step towards improving the girls' health and well-being. The enthusiastic participation of the community contributed to transforming the landscape as areas that were marred earlier by waste dumps and unpleasant odour for years underwent remarkable improvements.

SafaiMitra Suraksha Shivir

SafaiMitra Suraksha Shivirs were organized by various ULBs across the state from 17 September 2023 onwards. These Shivirs were aimed at making available and saturating welfare schemes for sanitation workers and their dependents to improve their well-being and quality of life. The objective of the Shivir was to target all sanitation workers working in solid waste management (SWM) and used water management (UWM). The most important aspect of the campaign was to reach out to the safai karamcharis at the ULB level for their health checkups where they were examined for diabetes and blood pressure. Subsequently SafaiMitras were informed about ill-effects of tobacco, gutka and pan masala. Some ULBs also distributed safety equipment to all SafaiMitras.

Key activities focused on mass awareness, preventive health check-ups, yoga shivirs and extending entitlement of various welfare benefits of central and state schemes in convergence with various ministries. This saturation approach for administering welfare schemes was to help enhance the safety and well-being and provide social protection to sanitation workers.

With the campaign, the ULBs and community can take pride in their collective achievement and look forward to a cleaner, healthier and more vibrant community in the days to come. Swachhata Hi Seva left an indelible mark on the hearts of the people proving that cleanliness is not just a duty but a way of life.

स्वच्छता पखवाड़ा के तहत साफ सफाई का कार्यक्रम आयोजित

धनबाद, 27 सितंबर, 2023 दैनिक जागरण

समाचार सार

चिरकुंडा बस व आटो स्टैंड में चला स्वच्छता अभियान

चिरकुंडा में बनों को शपथ दिलाते कार्यपालक पदाधिकारी संदीप पासवान = जागरण

संस, चिरकुंडा : स्वच्छता ही सेवा पखवाड़ा के तहत मंगलवार को चिरकुंडा नगर परिषद की ओर से आटो–बस स्टैंड तथा विभिन्न वार्डों में सफाई अभियान चलाया गया। इस दौरान सभी जगह ब्लिचिंग पावडर का छिड़काव किया गया। बस यात्री, चालक सहित स्थानीय दुकानदारों को परिसर को साफ रखने का निर्देश दिया। दुकान व प्रतिष्ठान के बाहर सभी तरह के कचरा को डस्टबीन में फेंकने की हिदायत दी। कार्यपालक पदाधिकारी संदीप पासवान व सिटी मैनेजर मुकेश निरंजन ने कहा कि एक अक्टूबर को स्वच्छता ही सेवा के तहत कुमारधुबी रेलवे स्टेशन, स्लम बस्ती, महापुरुषों की प्रतिमा कर सफाई की जाएगी।

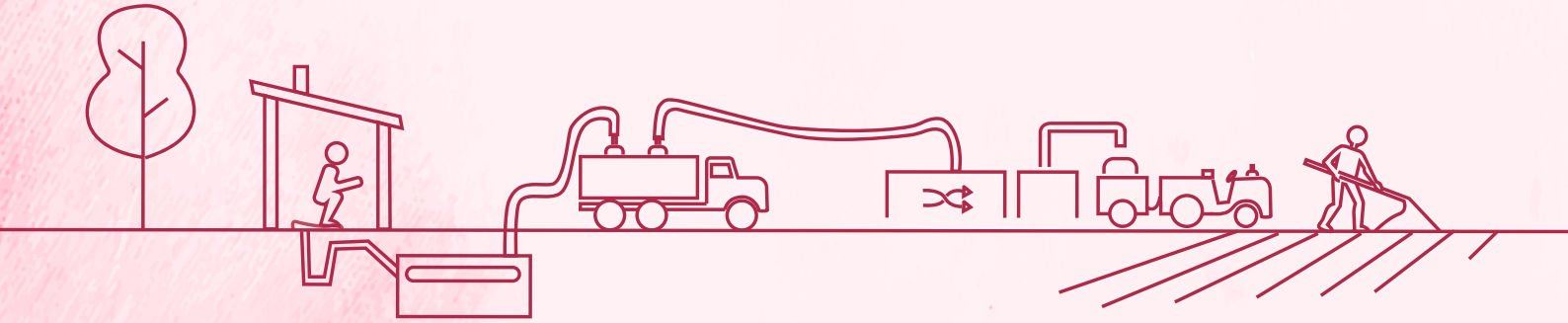
सिटी बाइट्स

जमुनिया तालाब की हुई सफाई

देवघर . मूर्ति विसर्जन के बाद शहरी क्षेत्र के तालाबों की सफाई के लिए विशेष अभियान चलाया जा रहा है . मंगलवार को जसीडीह के जमुनिया बांध तालाब की सफाई निगम की टीम ने की . नगर आयुक्त शैलेंद्र कुमार लाल ने बताया कि शहर में दो दिन में विश्वकर्मा पूजा और गणेश पूजा होने से तालाबों में प्रतिमा और पूजा सामग्री विसर्जित की गयी है . इसकी सफाई की जा रही है . मौके पर सफाई प्रभारी गोपाल महतो आदि थे .

F

HUMAN INTERVENTIONS



F 1: Empowering Change: Tales of Resilience and Transformation in Jharkhand

In Jharkhand, two extraordinary individuals, Lakhicharan Oraon from Damari and Leela Devi from Bundu Nagar panchayat, have undertaken transformative actions that made an impact on their communities through their resilience and determination.

Lakhicharan Oraon: A Beacon of Resilience in Damari

Lakhicharan Oraon's story is one of resilience and strength. Born in the tribal village of Damari to a marginalized tribal family, Lakhicharan had to support 13 family members. Struggling with poverty and limited opportunities, he worked as a daily wage labourer. His job was unstable and paid very little.

Lakhicharan's life changed when he became a sanitation worker for Bundu Nagar panchayat. This new job offered stability and purpose, but also brought many challenges.

As a sanitation worker, Lakhicharan faced many problems. He dealt with social stigma and logistical difficulties, often risking his safety. Without proper disposal sites, he had to use risky, secretive methods, which put him in danger and made people avoid him. Despite these challenges, Lakhicharan remained committed to his duties, driven by a strong sense of responsibility towards his community.

It was Lakhicharan's unwavering dedication that eventually catalysed action within the Nagar Panchayat. His strong advocacy for improved sanitation practices with critical stakeholders led to the construction of a Faecal Sludge Treatment Plant (FSTP), a landmark intervention that heralded a transformative shift in the community. With the establishment of the FSTP, a sustainable solution to sewage disposal was realized, alleviating the burden on sanitation workers like Lakhicharan and mitigating health hazards in the process.

Empowered by training and support from organizations including UNICEF, Lakhicharan and his fellow sanitation workers assumed a proactive role in promoting hygiene and ensuring community well-being. Their tireless efforts, coupled with community engagement initiatives, paved the way for a cleaner, healthier environment in Damari and beyond.

Lakhicharan Oraon, Sanitation worker

Leela Devi: A Champion of Change in Bundu

In Bundu Nagar Panchayat, Leela Devi embarked on a journey of empowerment and transformation. Like Lakhicharan, Leela faced her share of adversity, hailing from an economically weaker section and grappling with limited job opportunities due to her

background and gender. The onset of the COVID-19 pandemic further exacerbated her financial struggles, compounding the challenges she faced.

Amidst these hardships, Leela identified the unhygienic environment plaguing her community as a pressing issue that demanded urgent attention. Witnessing community members indiscriminately dumping waste, she recognized the need for collective action to address the root causes of the problem. Mobilizing members of the Maa Sherawali self-help group, Leela embarked on a mission to revolutionize health and sanitation practices in her community.

Through capacity-building training provided by Bundu Nagar panchayat, Leela galvanized her fellow group members to raise awareness about sanitation and hygiene. Their efforts bore fruit as open defecation ceased, drains were improved and cleaner streets emerged, transforming the very fabric of the community. Leela was recognized for her contributions and entrusted with the management of the office canteen and women's shelter home, empowering her fellow group members to meet their families' basic needs.

Looking ahead, Leela aims to educate her community about the Faecal Sludge Treatment Plant (FSTP) built under the Swachh Bharat Mission (Urban) 2.0, facilitating the safe treatment and reuse of faecal sludge from septic tanks. Her selfless actions have not only carved a niche for herself but have also inspired others to join the movement towards positive change.

A Unified Vision for Change

As the stories of Lakhicharan Oraon and Leela Devi converge, they epitomize the transformative power of grassroots activism and community-driven initiatives for faecal sludge. Their unwavering resolve and determination have not only improved the lives of their families but have also inspired a broader movement towards social and economic empowerment in Jharkhand towards faecal management.

Their journeys serve as a poignant reminder of the resilience inherent within marginalized communities and the immense potential for positive change when individuals come together with a shared vision and purpose. As we celebrate the achievements of Lakhicharan, Leela and countless others like them, let us recommit ourselves to building a more inclusive and equitable society for all, where every individual has the opportunity to thrive and contribute towards a brighter future.

Leela Devi: A Champion of Change in Bundu

F 2: Sanitation for Dignity: How Women Lead Change through Faecal Sludge and Septage Management in Assam

The journey towards sustainable sanitation practices in Assam has been marked by challenges and triumphs. Individuals like Mina Bala Das and Santa Karki Chetri are champions of change in the State, spearheading efforts to empower women through faecal sludge and septage management. Their narratives highlight the transformative potential of community-driven initiatives in achieving sanitation goals while promoting women's dignity and livelihoods.

Awareness activity for SHGs in Assam

Mina Bala Das: A Beacon of Empowerment in Goalpara

Mina Bala Das, a dedicated Community Resource Person under the National Rural Livelihoods Mission in Goalpara District, Assam, has long been committed to creating sustainable livelihood opportunities for women in her community. Recognizing the dearth of employment options for most women, she embarked on a quest to explore new avenues that could improve their lives.

When the prospect of faecal sludge and septage management surfaced in her area, Mina was initially sceptical, like many others. However, driven by curiosity and a desire to learn more, she delved deeper into the subject. Through interactions with experts and comprehensive training provided by local authorities and NGOs, Mina gained a nuanced understanding of the potential of faecal sludge treatment plants (FSTPs) to positively impact communities.

Armed with knowledge and conviction, Mina became a vocal advocate for faecal sludge and septage management among members of self-help groups (SHGs) in her community. Despite initial scepticism, her relentless efforts to raise awareness about the importance of proper sanitation and the opportunities offered by FSTPs began to yield results. Today, SHG

members eagerly anticipate the completion of the FSTP, recognizing it as a pathway to dignified livelihoods and improved community well-being.

Mina Bala Das, community resource person

Santa Karki Chetri: Leading the Charge for Sanitation in Goalpara

As an Additional Deputy Commissioner in Goalpara District, Assam, Santa Karki Chetri understands the pivotal role of sanitation in ensuring public health and environmental sustainability. With the district's recent achievement of Open Defecation Free (ODF) status, the focus has shifted towards safe management of human waste, presenting both opportunities and challenges.

When the concept of faecal sludge and septage management was introduced, Santa recognized its potential as a cost-effective and scalable solution to address sanitation issues in the district. However, navigating the complexities of implementing such a system required collaboration and resource mobilization from various stakeholders.

Despite facing resistance from some community members and legal hurdles, Santa remained steadfast in her commitment to promoting faecal sludge and septage management. Through advocacy, evidence-based arguments and sensitization efforts, she successfully garnered support for the construction of an FSTP in Goalpara, marking a significant milestone in the district's sanitation journey.

The stories of Mina Bala Das and Santa Karki Chetri exemplify the transformative power of community-driven initiatives in promoting sustainable sanitation practices and empowering women in Assam. As the FSTP nears completion, their efforts stand as a testament to the resilience, determination and collective action required to achieve sanitation goals while fostering gender equality and economic empowerment.

As Assam continues its journey towards universal access to clean water and sanitation, the narratives of Mina and Santa serve as guiding lights, inspiring others to join the movement for a healthier, more equitable future for all. With continued support from stakeholders and organizations like UNICEF, the vision of sustainable sanitation for every community in Assam draws closer to fruition, bringing hope and opportunity to countless women and their families.

Santa Karki Chetri, Additional Deputy Commissioner, Goalpara

F 3: From Hardship to Hope: The Impact of Sanitation Initiatives in Kumhari, Chhattisgarh

Transforming livelihoods through facilitating faecal sludge treatment: A case study of Haneshwar Prasad, Kumhari

Haneshwar Prashad Nishad, a resident of Kandarka area, has intimately experienced the economic hardship pervasive in his community. As the sole breadwinner in a family of four, his monthly income of Rs. 1,100 was not sufficient to cover even basic expenses, leaving no room for financial security. Haneshwar was involved with faecal sludge treatment plant (FSTP) from its early stages of construction. His dedication and hard work were recognized, leading to an offer to work as a plot operator. Despite initial doubts, his family encouraged him to pursue the opportunity, recognizing his role as the primary earner and urging him to prioritize his health and future. Before joining, he faced difficulties, especially financial constraints, including contractors not paying on time, which caused difficulties in his household. But Haneshwar's decision to join FSTP has greatly improved his financial stability and overall well-being.

Since joining the FSTP, Haneshwar's situation has improved significantly. While there were initial challenges in adapting to the work, he has grown accustomed to it over time and now finds fulfilment in his role. Importantly, the timely payment for his work has brought stability to his household, allowing for smoother financial management and even some savings, including investment in life insurance from the Life Insurance Corporation (LIC).

The FSTP clearly prioritizes working conditions and safety. UNICEF and partner organizations play a key role in monitoring, providing training on safety and security, and conducting awareness programmes and knowledge

Haneshwar Prashad Nishad, FSTP operator

sessions related to the disposal of faecal sludge matter (FSM) and sanitation work.

Haneshwar plays a crucial role in hosting and facilitating visits for national teams, including non-governmental organizations (NGOs), government officials and representatives from other municipalities. He provides comprehensive explanations of the FSTP operation, highlighting its impact on sanitation improvement and community development. He demonstrates how the FSTP efficiently manages faecal sludge, emphasizing its contribution to environmental conservation and public health.

Haneshwar's role in facilitating FSTP operations for national teams exemplifies the vital contribution of local expertise promoting sustainable development. His efforts not only showcase the effectiveness of the FSTP in addressing sanitation challenges but also foster

collaboration and knowledge exchange on a global scale, ultimately contributing to the advancement of community-driven initiatives worldwide.

Empowering Women through Community Participation: A Case Study of Shobha Chakradhari in Kumhari Ward No. 5

Shobha Chakradhari, a resident of Kumahri Ward No. 5 joined as a Supervisor in the Clean City Scheme, Kumhari municipality. Initially facing financial struggles and social prejudices, Shobha seized the opportunity to participate in the scheme as she recognized the potential to improve her financial stability and contribute to her community.

Initially, Shoba encountered several challenges during her work, including financial struggles; as a housewife, Shobha faced financial constraints in managing household expenses and educating her children. Also, Shobha experienced discriminatory behaviour from the society due to her background.

But all that changed during the COVID-19 pandemic. Shobha faced additional challenges and formed a team to adapt their work practices while ensuring safety measures. Despite challenges, Shobha made significant contributions through her working style. She mobilized other women to join the scheme, empowering them economically and socially. Shobha's supervision enhanced waste management practices, leading to cleaner surroundings and improved public health.

UNICEF and partner organizations provide training sessions to sanitary workers on safety and security measures while performing their duties. These sessions equip workers with the necessary skills and knowledge to mitigate risks and ensure their well-being during sanitation operations. UNICEF and its partners closely facilitate weekly meetings to serve as a platform for discussing challenges, sharing best practices and receiving feedback, communication and

Shobha Chakradhari, sanitation worker supervisor

coordination to educate the residents on proper waste disposal practices, hygiene habits and role of sanitation workers in maintaining a clean environment.

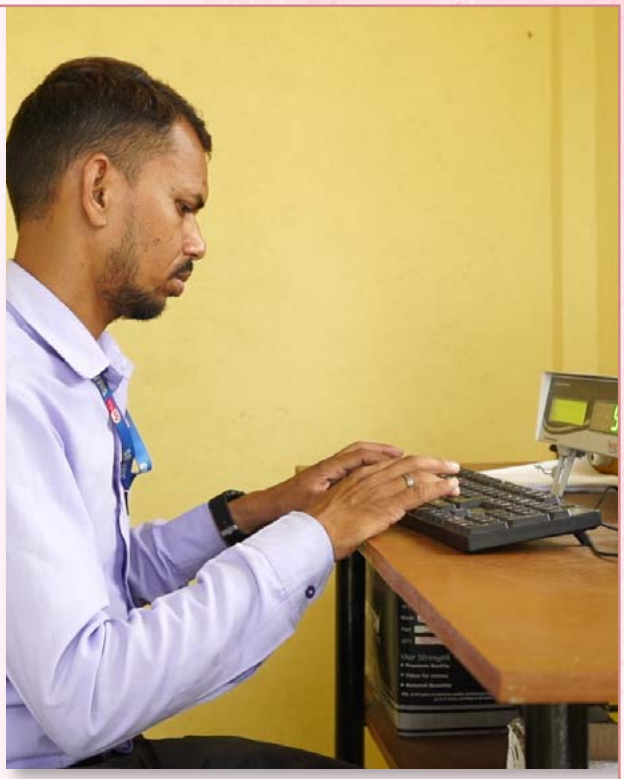
Shobha's shared her journey during the session and her involvement has inspired all the women. Her dedication and resilience transformed community perceptions, earning respect and recognition for the work of sanitation workers.

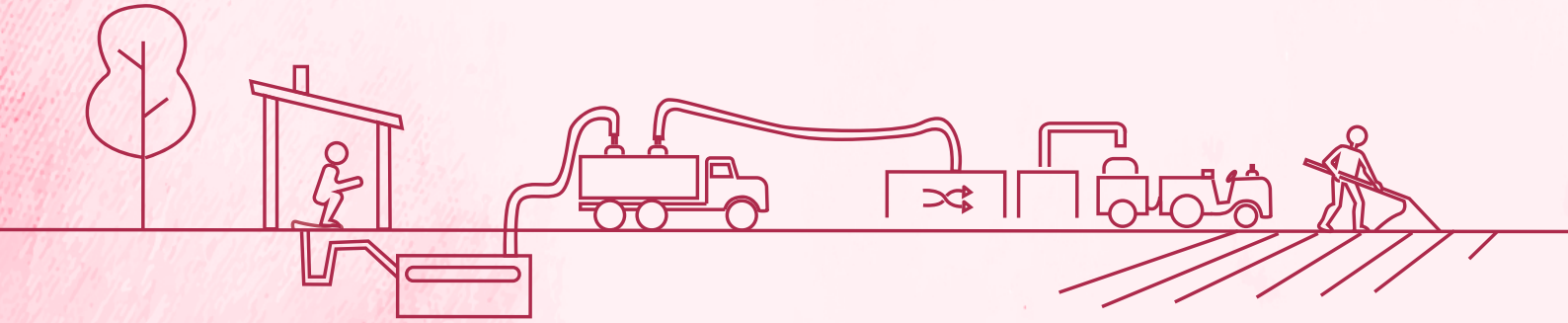
Shobha's participation empowered her financially, enabling her to balance expenses and improve her family's livelihood. Also, her efforts changed societal attitude towards sanitary workers, earning respect and appreciation for their contributions. Shobha and her team availed various government schemes, enhancing their socioeconomic well-being.

Her resilience, dedication and leadership serve as an inspiration for individuals and communities striving for inclusive development and environmental sustainability, stressing the importance of community-driven approaches in addressing societal challenges and promoting equitable growth.

Empowering women through community participation

G MONITORING





G 1: Role of Monitoring and Evaluation in Faecal Sludge Management

Introduction

The FSSM project laid emphasis on the need for monitoring.

Investigation and Identification of Key Monitoring Indicators

While the project began, an in-depth assessment of the national and international literature pertaining to Faecal Sludge and Septage Management (FSSM) was carried out. Even with so many studies at hand, it was clear that there were not many monitoring guidelines. The project monitoring team proceeded to investigate further, going over other case studies in order to identify important monitoring indicators. Three theme areas for monitoring were identified as a result of this process: (i) State/ULB-level FSSM monitoring; (ii) FSTP/STP-level monitoring; and (iii) household-level FSSM monitoring. Every theme area was carefully developed to collect crucial information pertinent to FSSM processes across a range of operational levels.

Webinar on Monitoring Faecal Sludge Management

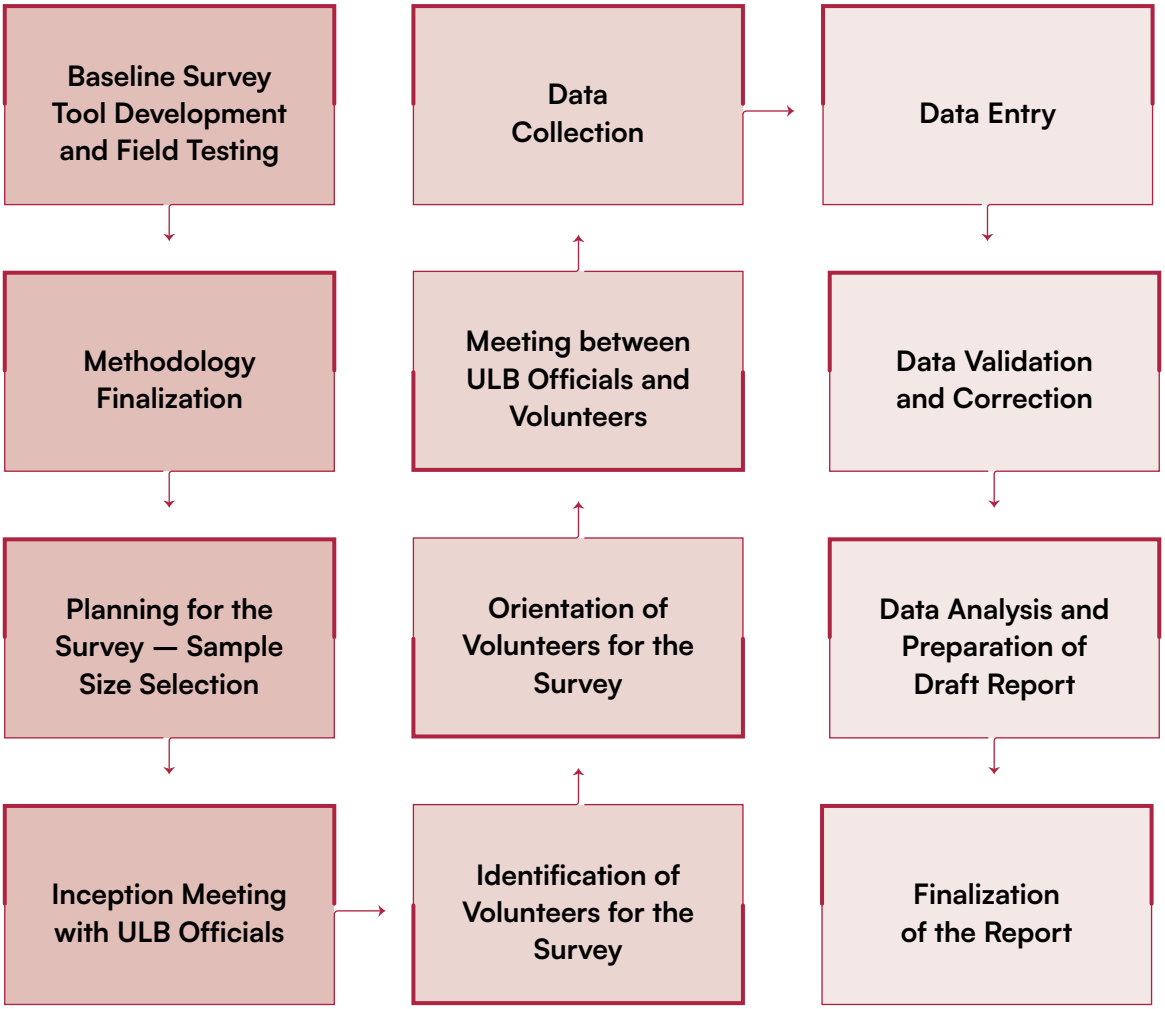
In order to promote partnership and knowledge exchange, a webinar on FSSM monitoring was organized to gain the perspectives of both domestic and global specialists. The webinar offered a forum for examining extant literature and gaining knowledge from a range of FSSM monitoring experiences. The goal of the webinar was to advance knowledge of FSSM monitoring procedures and apply them to the project.

Baseline Assessments and Findings

Selected urban local bodies (ULBs) in the four States underwent baseline assessments in accordance with the project's goals. These evaluations used both qualitative and quantitative data collection techniques and covered a wide variety of FSSM-related characteristics. The results of the baseline evaluations offered important new information about the state of containment, transportation and emptying procedures, treatment procedures and community and public lavatory conditions. Subsequent initiatives and recommendations for policy were derived from these research results.

Baseline Implementation Process Flow

S.N.	State	Month and Year of survey
1	Madhya Pradesh	September 2021
2	Chhattisgarh	November 2021
3	Assam	December 2021
4	Jharkhand	November 2022 Revised — April 2023



Field Survey Timelines

The results of the baseline evaluations offered important new information about the state of containment, transportation and emptying procedures, treatment procedures, and community and public lavatory conditions.

Subsequent initiatives and recommendations for the initiatives under the project were derived from these research results.

Field survey from Assam and Chhattisgarh

Focus on Endline Survey and Continued Support

As the project nears its conclusion, attention has shifted towards conducting endline surveys to assess progress and highlight areas for improvement. The endline surveys are now being undertaken in the States. The results will give quantitative data on the outcome of the FSSM projects. Furthermore, State Governments have expressed a keen interest in continuing the support from UNICEF in FSSM across all four States. This demand underscores the importance and impact of the project, signalling a commitment to sustained progress in urban sanitation.

Introduction of IT-enabled Monitoring Structure

Recognizing the need for streamlined monitoring processes, a tender was floated for an IT firm to establish an IT-enabled structure for FSSM monitoring. The envisioned structure aimed to develop a database and dashboard for reporting FSSM service data at the state, ULB and FSTP levels. Additionally, a user-friendly application was planned to facilitate external monitoring of FSSM services, catering to various stakeholders across the project States.

In a significant development, the Ministry of Housing and Urban Affairs (MoHUA) introduced the UPYOG portal, a multipurpose application portal for addressing urban issues. Leveraging this initiative, the IT firm tasked with FSSM monitoring integrated the project's requirements with UPYOG. This integration streamlined monitoring efforts across Assam, Jharkhand and Chhattisgarh, with the support from eGov Foundation and NIUA organizations. The software is currently under deployment at the state level.

Features of UPYOG Portal

Single Window
Provide "single window" services to citizens on anytime — anywhere basis

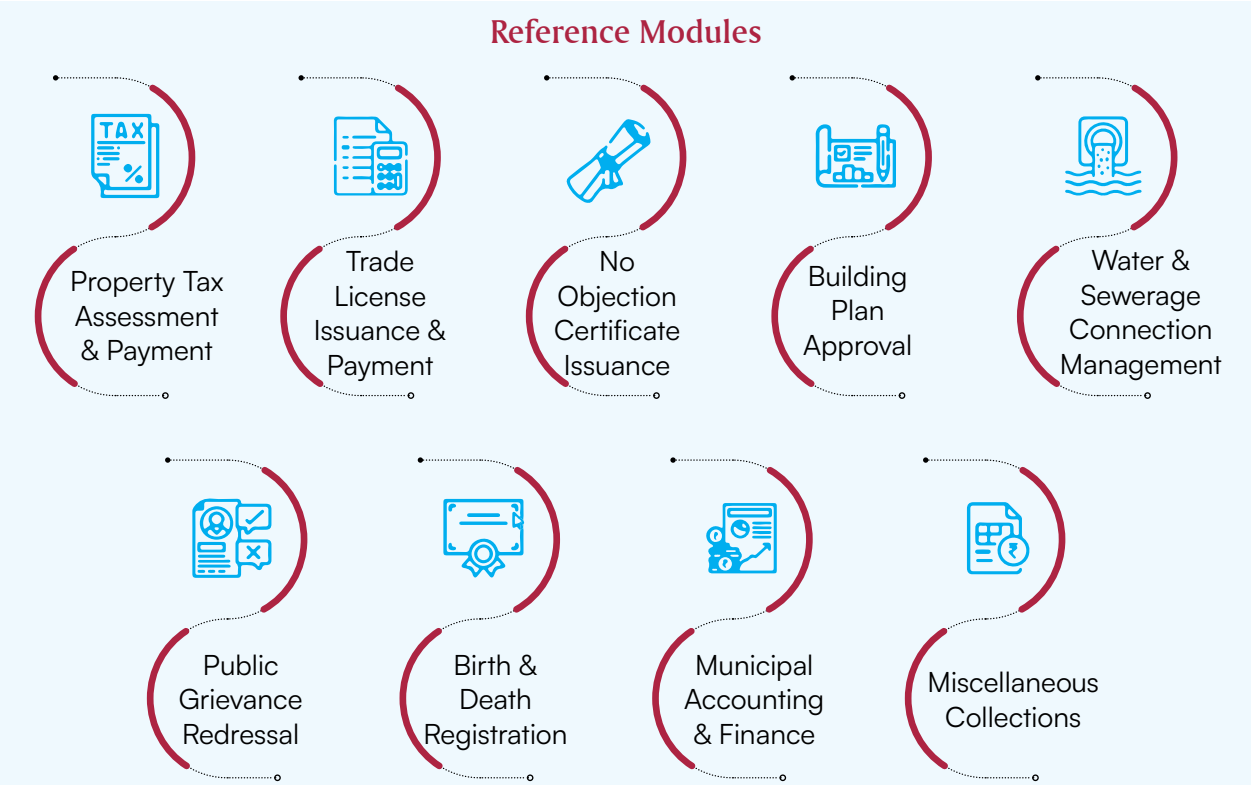
Standards-based Approach
Adopt a standards-based approach to enable integration with other related applications

Efficiency & Productivity
Increase the efficiency and productivity of of ULBs

Timely & Reliable Information
Provide timely and reliable management information relating to municipal administration for effective decision making

ULB Information System
Develop a single and integrated view of ULB information systems across the State

Reference Module in UPYOG



The BMGF-UNICEF partnership's endeavour to revolutionize faecal sludge and septage management in India has yielded significant strides in sustainable urban sanitation. Through meticulous monitoring and evaluation, innovative technological interventions and collaborative initiatives, the project has laid a strong foundation for continued progress in FSSM practices. As the project transitions into its next phase, the legacy of transformative change in faecal sludge management promises a cleaner, healthier future for urban communities across India.

G 2: Facilitating FSSM Service Delivery by the Use of Digital Processes

Vision

To leverage the digital opportunities for sustained improvement in efficiency and effectiveness of delivery of municipal service to citizens, the UPYOG programme assists municipal bodies across India to improve service delivery mechanisms, achieve better information management and transparency and maximize citizen's involvement in participative governance. For the management of FSSM services, the UPYOG platform is sought to be leveraged.

Purpose

UPYOG is the national reference platform created for the delivery of municipal services online, which utilizes the National Urban Innovation Stack principles. The programme will use the following framework to reach its goals:

- An open digital platform together with nine reference modules.
- Standards for platforms, software and data reporting related to municipal services delivery.
- A panel of service providers who have been vetted and approved to work with States on implementing the platform, together with indicative rates for their services.
- Programme Implementation Guidelines on various elements of programme design to enable adoption of the platform and applications.

Integration of a National Dashboard with State Dashboard: UPYOG roll out, Punjab, for FSSM

- The integration of dashboard was done in five months and proper assistance was provided to the State and system integrator by the Programme Fellow, Punjab.
- Issues, gaps and problems were identified and resolved with the assistance of NUDM team.
- Stakeholder meetings were arranged by the Fellow to avoid conflict and smooth working while respecting the timelines.
- Data errors in between the dashboards (national and State) were identified by the Fellow and were further proceeded to the concerned person for resolution.

About Velocity Software Solutions Pvt. Ltd

The project engaged Velocity Software Solutions to set up an FSSM monitoring system on the UPYOG platform. Velocity is a leading technology and business-driven professional services firm renowned for exceeding client expectations and achieving organizational goals. Its diverse and dynamic team specializes in a range of services including e-Commerce, office automation and mobile and website development across various platforms such as ASP.Net, PHP, Microsoft SharePoint and mobile operating systems like Android, iOS, and Windows 8. Velocity has collaborated with esteemed clients such as UNICEF, UNDP, UNFPA, UN Women, Larsen & Toubro, P&G and Fujitsu. It is also recognized through prestigious certifications and partnerships including Deloitte Technology Fast 500, membership in NASSCOM, collaborations with IBM and ISO 9001 and ISO/IEC 27001:2005 certifications,

as well as being a Microsoft BizSpark start-up. Velocity has developed the innovative FSSM application, leveraging its extensive expertise to improve the management of faecal sludge sanitation services effectively.

Introduction of FSSM

Under the UNICEF—BMGF partnership, a digital tool has been developed that enables urban local body (ULB) employees to deliver desludging services (emptying septic tanks) for citizens. The objective is to improve the efficacy of the Faecal Sludge and Septage Management (FSSM) in the State. FSSM is a critical part of SBM II and will also help to achieve the SDG target 6.2 of adequate and inclusive sanitation for all in a time-bound manner. The lack of standardized practice and absence of systematic coordination among the key stakeholders often creates unfavourable grounds to fully externalize the value of FSSM.

The desludging application will be able to provide data and visibility to track service requests and understand the service delivery value chain paving the way for process enhancements in FSSM.

The product will provide the following benefits

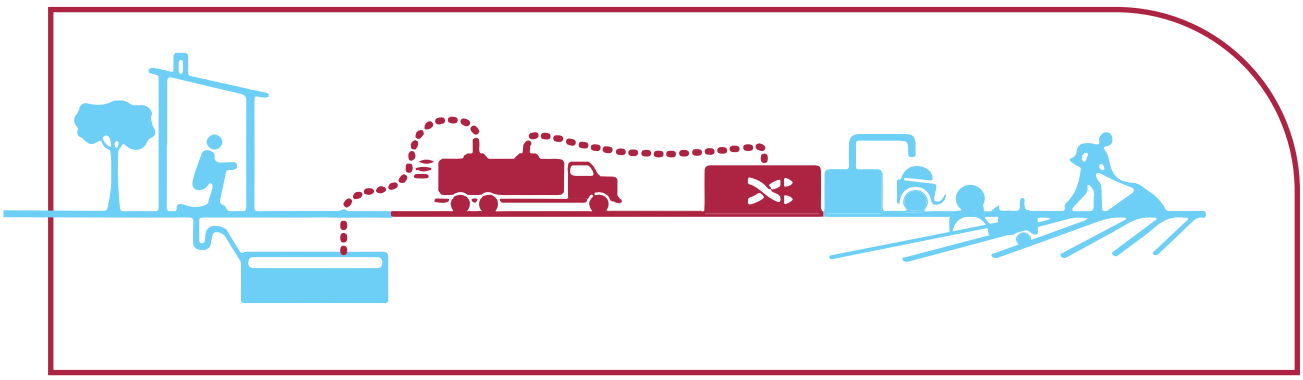
1. Reduce time taken for service delivery.
2. Establish a chain of custody of waste from the point of collection to disposal.
3. Digital record keeping of service deliveries.
4. Support data interoperability with other sanitation systems in the State.
5. Improve sustainability by providing visibility and control to the Government.

Benefits and Importance

The UPYOG-based FSSM system introduces a multitude of benefits aimed at transforming urban sanitation landscapes:

- **Environmental Sustainability:** By ensuring proper treatment and disposal of faecal sludge, UPYOG FSSM significantly reduces pollution and contamination of water bodies.
- **Public Health Improvement:** Enhanced sanitation facilities lead to a direct reduction in waterborne diseases and health hazards associated with improper waste disposal.
- **Operational Efficiency:** Digitalization of service requests, tracking and management optimizes operational workflows, saving time and resources for ULBs.
- **Increased Transparency:** Real-time tracking and digital records enhance accountability and transparency between service providers and beneficiaries.

The UPYOG FSSM system stands out for its ability to address critical gaps in traditional FSSM approaches. Through digital integration, it brings together households, ULBs and service providers on a unified platform, facilitating efficient service delivery and management. This system is not just a step towards improving



Sanitation value chain

sanitation; it is a leap towards ensuring dignity, health and well-being for all urban residents.

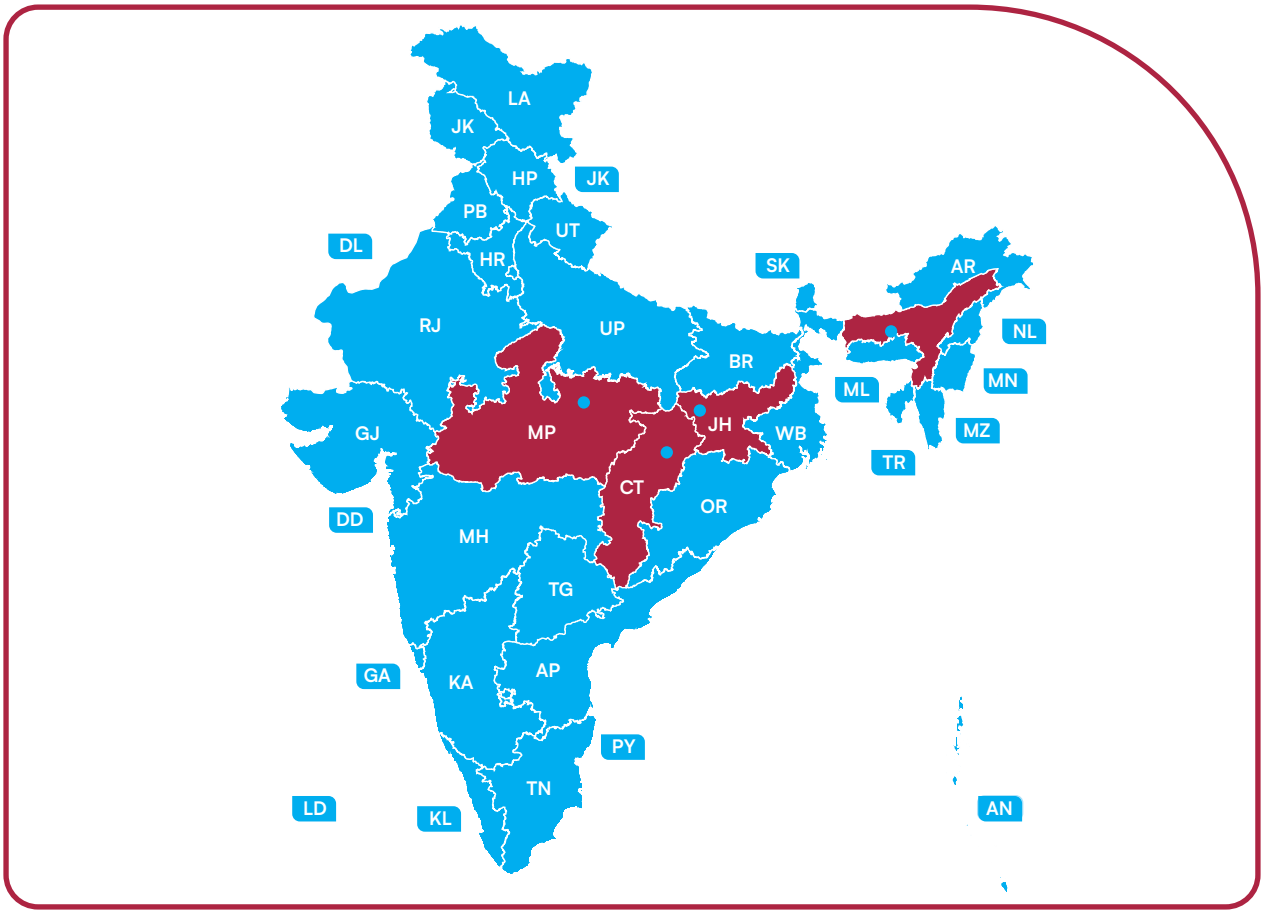
Collaborative Implementation in Four States

The UPYOG FSSM system is being implemented in the four project States: Assam, Chhattisgarh, Jharkhand and Madhya Pradesh. The States presented unique challenges, requiring tailored approaches to integration and deployment.

- **Assam:** Tackled the issue of using a holding ID instead of a mobile number for application login, as the holding ID is connected to the property tax portal.
- **Chhattisgarh:** Adjusted the system to allow the total amount field to be editable to accommodate varying charges for multiple trips.
- **Jharkhand:** Prioritized the development of an FSTP progress dashboard, facilitating State officials in monitoring the status of FSTP advancements.

The journey of gathering information for the implementation of the UPYOG FSSM system across the four States of Assam, Chhattisgarh, Jharkhand and Madhya Pradesh have been met with remarkable support and cooperation from each state. The State officials have not only been immensely supportive but have also provided a detailed explanation of the processes and practices specific to their regions.

This collaborative effort has enabled the tailoring of the UPYOG system to meet the unique challenges and requirements of each State. Furthermore, the States have shared comprehensive data related to ULBs, Desludging Operators (DSOs) and Faecal Sludge Treatment Plants (FSTPs), facilitating a smooth integration and deployment of the system. This level of detailed cooperation and information sharing has been instrumental in ensuring that the UPYOG system is effectively



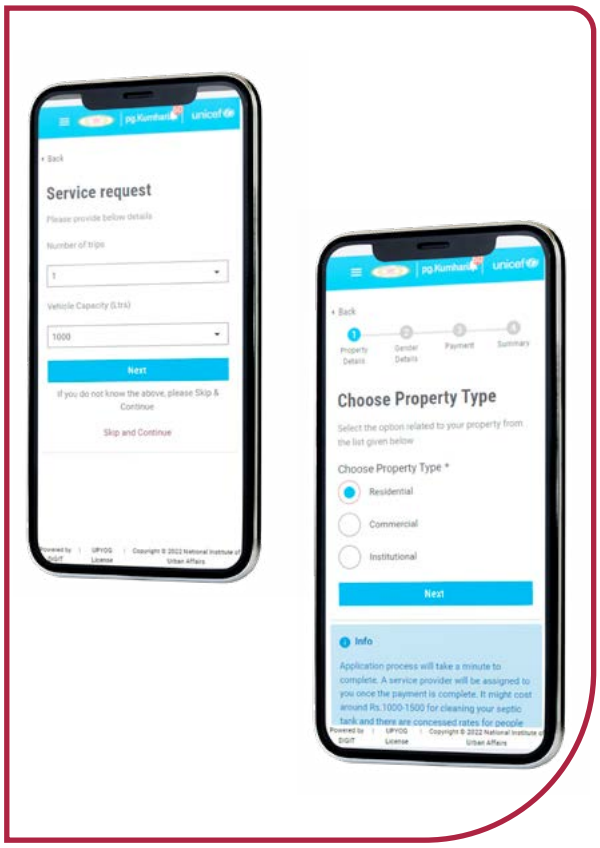
customized and optimized for each State's specific sanitation needs.

Sludge Management Stages in the Software

These stages, from request raising and sludge loading to disposal, underscore the multifaceted approach required to manage faecal sludge effectively. A breakdown of the sludge management stages is provided below:

1. Raising a 'Desludging Request'

- Citizens initiate desludging requests for the desludging service via an application.
- Requests can also be made by either visiting the ULB directly or dialling a toll-free number, providing necessary details such as name, address and ward number, and the ULB employee will raise a request on behalf of the citizen via the application.



Citizen's Interface (Raising a desludging request)

2. Sludge Collection from the Citizen's Location

- The ULB assigns a cesspool operator.

Sludge-collecting vehicle at the FSTP (Faecal Sludge Treatment Plant), Kumhari.

Note: Visits to Assam, Jharkhand, Chhattisgarh and Madhya Pradesh were conducted to understand on-ground procedures implemented for Faecal Sludge Management. The picture of the sludge-collecting vehicle was taken at FSTP Kumhari, Chhattisgarh.

Sludge collection at the citizen's

3. Sludge Collection from Citizen's Location

- The cesspool operator will visit the citizen's location to collect the sludge.

4. Disposal at the designated FSTP

- The cesspool operator will visit the FSTP (Faecal Sludge Treatment Plant) for the unloading and further treatment of the sludge.
- Entire data is captured in the database.
- Urban–rural convergence is proposed in this so that coverage increases and FSTPs are effectively utilized.

Sludge Collecting Vehicle at the FSTP, Kumhari, Chhattisgarh.

FSTP in Bundu, Jharkhand.

BMGF foreword to be placed after UNICEF foreword

G 3: Through the Lens of Change: Monitoring Report of a Multi-state Analysis of the Status of FSSM in Four States

"Monitoring and reporting are the compass and map that guide us through the complex terrain of progress, helping us navigate towards our goals with clarity and accountability."

— Kofi Annan

Introduction

India has achieved significant progress under the Swachh Bharat Mission Phase 1 (2014—2019) to increase access to toilet facilities for almost the entire population. India now provides a global model for prioritizing sanitation as represented by the government's Swachh Bharat Mission (SBM), which accelerated sanitation access to all households.

To continue the strides made in sanitation with SBM phase 1, the focus must shift towards Feacal Sludge and Septage Management (FSSM) monitoring and reporting. India's Sustainable Development Goal 6.2 focuses on ensuring that everyone has access to adequate and equitable sanitation and hygiene by 2030. It aims to end open defecation, with special attention to the needs of women, girls and those in vulnerable situations. In order to fulfil the SDG goals by 2030, it is imperative that India institutes measures to solve the long-standing issue of safely managed sanitation, which is defined as "the use of improved sanitation facilities that are not shared with other households and where excreta are safely disposed of in situ or treated off-site". Currently, in urban areas, only 40 per cent of the population is connected to sewer networks and to about 1,200[5] operational or under-construction Sewage Treatment Plants (STPs). Most of the toilets (60 per cent)[6] rely on on-site sanitation systems (OSS). The lack of space and options for disposal of untreated faecal matter (emptied from on-site sanitation systems), weak regulation and lack of enforcement of these regulations by city authorities, ad-hoc management models being currently run by unlicensed and unmonitored operators, lack of technical and general awareness across stakeholders — government officials at State and local government level, consumers/citizens and local intermediate operators as well as the absence of qualified and competent service providers — often result in untreated sludge disposal into spaces that could be an empty field or urban water bodies or open drains or rivers, leading to serious damage to the environment as well as affecting public health.

Effective monitoring systems are essential to ensure the success of measures taken for Faecal Sludge and Septage Management (FSSM) in India as it allows for checking the progress made in different regions and provide further support where needed, improving the lives of individuals across the country.

Intervention Overview

UNICEF, in collaboration with Bill and Melinda Gates Foundation (BMGF), embarked on a partnership on FSSM intervention with the State governments in urban areas in four States across the country: Assam, Chhattisgarh, Jharkhand and Madhya Pradesh. This intervention was made at the State level and

[5]https://nrcd.nic.in/writereaddata/FileUpload/NewItem_210_Inventorization_of_Sewage-Treatment_ Plant.pdf with added research by NFSSM Alliance

[6]https://washdata.org/data/household#!/table?geo0=region&geo1=sdg

focused on providing support to two urban local bodies (ULBs) in each State. This intervention included supporting the development of FSSM infrastructure and systems to build a sanitation value chain from containment to treatment. One of the key proposed outcomes of this intervention was to increase the volume of faecal sludge treated and safely managed by 25 per cent in three years of start of the project, in the identified ULBs, in the four states. This article will examine how the intervention was planned and the resulting change measured as a result of the programme intervention over the last three years.

Methodology

A theoretical framework was developed to assess the baseline FSSM status in the eight identified ULBs across the four States, and progress was monitored to report changes over the project duration. The framework included four stages of FSSM: containment, emptying and transportation, treatment and re-use and disposal. A baseline assessment and an endline assessment were done to capture data on the identified indicators related to following stages: containment, emptying and transportation and treatment.

Data Collection

Data collection involved both quantitative and qualitative methods, including household surveys, public toilet assessments, treatment plant inspections and interviews with cesspool operators, ULB representatives and desludging operators. A general ethical consent was obtained for data collection.

Key Indicators and Composite Scoring

The indicators and data points captured are detailed in Table 1. A composite scoring methodology was used to calculate baseline and endline scores, allowing for a comparison and analysis of percentage change in the measured parameters over three years. A standardized weight and a target were decided through an internal consultative process.

Table 1: Key Indicators for FSSM Monitoring

Stage	Data Point
Containment and Emptying	Percent of households that undertake desludging
Transportation and Treatment	Number of vehicles available for desludging and transporting faecal sludge
	Average capacity of each vehicle (litres)
	Number of functional Faecal Sludge Treatment Plants (FSTPs)
	Capacity of each FSTP (kilolitres per day (KLD))
	Average capacity at which FSTPs are functioning (%)

Calculation Methodology

To calculate the proposed outcome:

1. **Total sludge emptied** and transported for each ULB/day = Number of transportation vehicles * Average capacity of each vehicle
2. **Total sludge treated** for each ULB/day = Number of functional FSTPs * Capacity of each FSTP * Average capacity at which FSTPs functioned

These calculations were used to derive the baseline and endline scores, which were then compared to assess progress. The baseline and endline scores were calculated as:

I. **Baseline (Endline)/Proposed target*weightage = score**

II. **Percentage Change= (Endline Score — Baseline Score) / Baseline score* 100**

Findings and Changes Observed

Containment and Emptying

Household desludging rates improved markedly, with an increase from 2 to 31 per cent in Giridih (Jharkhand) and reaching 38 per cent in Bundu (Jharkhand). However, in Nagaon (Assam), no change was observed from a desludging rate of

33% desludging over three years. Furthermore, in Budni in Madhya Pradesh, where sewer network was established, a significant rise in sewage treated was observed.

Transportation and Treatment

Initially, most ULBs had only one desludging vehicle, but the number of these vehicles increased significantly, with Giridih (Jharkhand) acquiring up to eight vehicles. Post-intervention, the average volume of sludge transported ranged from 3,000 to 28,000 litres per day. Six **new FSTPs were** commissioned in Assam, Jharkhand and Madhya Pradesh, with operational c**apacit**ies increasing by an average of 50 per cent.

Summary of Changes by State

The detailed changes observed in each ULB are summarized in Annexure 2.

- **Chhattisgarh:** Significant improvements in desludging rates and sludge transportation.
- Assam: Progress seen in Goalpara; FSTP under construction in Nagaon.
- Jharkhand: Marked increases in desludging and transportation capacities.
- Madhya Pradesh: Notable enhancements in treatment capacity, both in Goalpara and specifically Budni, which now has two functional STPs.

Conclusion and Recommendations

Positive progress has been observed across various data points in the targeted ULBs. However, challenges remain, such as the operationalization of new FSTPs and the effective utilization of STPs. To enhance FSSM management, implementation of an advanced IT-enabled monitoring system is recommended, capturing real-time data and providing actionable insights.

Annexure 1: Summary table of findings from ULBs

Chhattisgarh

Stages of FSSM as per Theoretical Framework	Key Performance Indicators from Baseline Report	Datapoints												
			Chhattisgarh — **Ambikapur**						Chhattisgarh — **Kumhari**					
		Weightage	Proposed Target	Baseline	Baseline Score	Endline	Endline Score	% Change	Proposed Target	Baseline	Baseline Score	Endline	Endline Score	% Change
Containment and Emptying	Percentage of households that has undergone desludging	0.3	27%	2%	0.02	18%	0.20		46%	21%	0.08	23%	0.15	
Transportation and Treatment	Number of vehicles available for transportation of faecal sludge from the household to the treatment site		5	4		5			1.25	1		3		
	Average capacity of each vehicle (in Ltrs)		2500	2000		2600			2500	2000		2167		
	Total sludge transported for each ULB in states (in Ltrs)/day	0.4	12500	8000	0.26	13000	0.40		3125	2000	0.26	6501	0.40	
	Number of Fecal Sludge Treatment Plants (FSTP) that are functional in the ULB		1	1		1			1	1		1		
	Capacity of each FSTPs in order to process and treat the faecal sludge deposited (in KLD)		45	20		20			31	6		6		
	Average capacity at which the FSTPs is functioning (in %)		80%	55%		90%			80%	40%		80%		
	Total sludge treated for each ULB in states (in Ltrs)/day	0.3	36	11	0.09	18	0.15		24.80	2.40	0.03	4.8	0.06	
Grand Total (in %)					37		75	103			37		61	66

Assam

Stages of FSSM as per theoretical framework	Key performance Indicators from Baseline report	Datapoints												
			Assam — **Goalpara**						Assam — **Nagaon**					
		Weightage	Proposed Target	Baseline	Baseline Score	Endline	Endline Score	% Change	Proposed Target	Baseline	Baseline Score	Endline	Endline Score	% Change
Containment and Emptying	Percent of households that has undergone desludging	0.3	41%	16%	0.12	29%	0.21		58%	33%	0.17	33%	0.17	
Transportation and Treatment	Number of vehicles available for transportation of fecal sludge from the household to the treatment site		1.25	1		2			3.75	3		3		
	Average capacity of each vehicle (in Ltrs)		2500	2000		2500			1875	1000		1000		
	Total sludge transported for each ULB in states (in Ltrs)/day	0.4	3125	2000	0.26	5000	0.40		7031	3000	0.26	3000	0.26	
	Number of Fecal Sludge Treatment Plants (FSTP) that are functional in the ULB		1	0		1			1	0		0 (*20 KLD FSTP is under construction)		
	Capacity of each FSTPs in order to process and treat the feacal sludge deposited (in KLD)		45	0		7			25	0		0		
	Average capacity at which the FSTPs is functioning (in %)		80%	0%		7%			25%	0%		0%		
	Total sludge treated for each ULB in states (in Ltrs)/day	0.3	36	0	0.00	0.49	0.00		6.25	0.	0	0	0	
Grand Total (in %)					37		62	64			43		43	0*

Jharkhand

Stages of FSSM as per Theoretical Framework	Key Performance Indicators from Baseline Report	Datapoints												
			Jharkhand — **Giridih**						Jharkhand — **Bundu**					
		Weightage	Proposed Target	Baseline	Baseline Score	Endline	Endline Score	% Change	Proposed Target	Baseline	Baseline Score	Endline	Endline Score	% Change
Containment and Emptying	Percentage of households that has undergone desludging	0.3	27%	2%	0.02	31%	0.30		28%	3%	0.03	38%	0.30	
Transportation and Treatment	Number of vehicles available for transportation of faecal sludge from the household to the treatment site		1.25	1		8			1.25	1		2		
	Average capacity of each vehicle (in Ltrs)		4375	3500		3500			5000	4000		3500		
	Total sludge transported for each ULB in states (in Ltrs)/day	0.4	5469	3500	0.26	28000	0.40		6250	4000	0.26	7000	0.40	
	Number of Faecal Sludge Treatment Plants (FSTP) that are functional in the ULB		1	0		1			1	0		1		
	Capacity of each FSTPs in order to process and treat the faacal sludge deposited (in KLD)		25	0		52			25	0		6		
	Average capacity at which the FSTPs is functioning (in %)		25%	0%		65%			25%	0%		56%		
	Total sludge treated for each ULB in states (in Ltrs)/day	0.3	6.25	0	0.00	33.8	0.30		6.25	0.00	0.00	3.36	0.16	
Grand Total (in %)					28		100	259			29		86	199

Madhya Pradesh

Stages of FSSM as per Theoretical Framework	Key Performance Indicators from Baseline Report	Datapoints												
			Madhya Pradesh — **Pithampur**						Madhya Pradesh — **Budhni**					
		Weightage	Proposed Target	Baseline	Baseline Score	Endline	Endline Score	% Change	Proposed Target	Baseline	Baseline Score	Endline	Endline Score	% Change
Containment and Emptying	Percentage of households that has undergone desludging	0.3	31%	6%	0.06	37%	0.30		41%	16%	0.12	96%* (including all connections to sewage system)	0.3	
Transportation and Treatment	Number of vehicles available for transportation of faecal sludge from the household to the treatment site		5	4		4			1.25	1		2		
	Average capacity of each vehicle (in Ltrs)		4375	3500		3500			4375	3500		3500		
	Total sludge transported for each ULB in states (in Ltrs)/day	0.4	21875	14000	0.26	14000	0.26		5469	3500	0.26	7000	0.40	
	Number of Faecal Sludge Treatment Plants (FSTP) that are functional in the ULB		1	1		1			1	0		3* (1 FSTP, 2 STPs)		
	Capacity of each FSTPs in order to process and treat the faecal sludge deposited (in KLD)		45	20		40			25	0		1136		
	Average capacity at which the FSTPs is functioning (in %)		100%	75%		100%			25%	0%		50%		
	Total sludge treated for each ULB in states (in Ltrs)/day	0.3	45	15	0.10	40	0.27		6.25	0.00	0.00	1704	0.30	
Grand Total (in %)					41		82	100			37		100	170

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