



Proceedings of the Inaugural Roundtable of **Chief Engineers' Forum for Swachh Bharat**



by

All India Institute of Local Self Government, Mumbai
(The Secretariat of Maharashtra WASH-ES Coalition)

in partnership with
Swachh Bharat Mission (U) 2.0



Under the aegis of Swachh Bharat Mission (U)

Chief Engineers' Forum for Swachh Bharat

An initiative by All India Institute of Local Self Government (AIILSG), Mumbai in partnership with Swachh Bharat Mission Urban with an aim to facilitate a series of dialogue amongst policy makers, engineers and technology providers towards achieving Sustainable Solid Waste Management and Sustainable Used Water Management



The proceedings of the Inaugural Roundtable of this forum have been jointly developed by

**All India Institute of Local Self Government (AIILSG), Mumbai
and Indian Institute of Technology (IIT), Mumbai**

with support from

**Central Public Health and Environmental Engineering Organization (CPHEEO)
Ministry of Housing and Urban Affairs (MoHUA), Government of India**

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Background

Urban sanitation is a key priority in India's development agenda, with focused efforts on mechanization, innovative service delivery, and used water management. The Government of India's flagship missions—Swachh Bharat Mission (Urban) 2.0, AMRUT 2.0, and NAMASTE Program—demonstrate a strong commitment to ensuring safe sanitation while prioritizing the safety and dignity of sanitation workers. Solid and liquid waste is increasingly recognized not as waste but as a resource, opening new pathways for recovery, co-treatment, and urban-rural convergence. Despite progress, cities face challenges related to operational and financial sustainability of the treatment facilities leading to limited scope for recycling and resource recovery. Addressing these requires an integrated approach combining advanced technologies with worker-centric operational and policy frameworks.

For this, AILSG Mumbai as a Swachhata Knowledge Partner (SKP) of MoHUA conceptualised a multi-stakeholder platform for PHE engineers and partnered with Swachh Bharat Mission Urban to establish the Chief Engineers' Forum for Swachh Bharat. This dedicated technical platform is established with an aim of facilitating techno-policy dialogues amongst the chief engineers / city engineers, policymakers, implementers, technology providers and subject experts. The inaugural roundtable of this forum was launched **by Smt. Roopa Mishra, National Mission Director and Joint Secretary of SBM (U) and Ministry of Housing and Urban Affairs and Dr. Jairaj Phatak, IAS, Director General, AILSG on 15th October 2025** at IFAT India 2025. Chief / City Engineers working at state / city-level across the nation, actively participated and contributed to the discussions.



Objectives of the of the Chief Engineers Forum for Swachh Bharat

- 1. To create a platform for structured peer-to-peer learning**, expert interactions, and techno-policy dialogue on used water and solid waste management and to enable Chief/City Engineers to contribute to constructive discussions on technical innovations, implementation challenges, service delivery reforms, and safety framework.
- 2. To facilitate exposure and interaction** with sanitation, waste management and recycling technologies, thereby enhancing technology adoption and innovation.



Welcome and Introduction by **Smt. Utkarsha Kavadi,** **Sr. Executive Director, AILSG**



IFAT India 2025 is a trade-fair of WASH technologies showcasing over 5,000 sanitation products with participation from 30+ countries. AILSG Mumbai, building on an eight-year partnership with IFAT India, in collaboration with the Swachh Bharat Mission (Urban) proposed the launch of a first-of-its-kind Chief Engineers' Forum for Swachh Bharat. The Forum has been conceptualized in response to India's evolving sanitation narrative from waste management to resource recovery under SBM-U 2.0 and aims to address local-level implementation and management challenges affecting sustainability of the systems. It seeks to establish a multi-stakeholder platform bringing together policymakers, implementers (engineers), technology providers, and subject experts to enable sustained techno-policy dialogues through a series of structured discussions. She expressed gratitude for the continued guidance and support of

the Joint Secretary, MoHUA, for bringing this idea to life and acknowledged the contributions of the team from CPHEEO and MoHUA for strengthening it further. She also thanked IFAT India for providing a platform for making this initiative possible.



Inaugural Address by **Dr. Jairaj Phatak (Retd. IAS), Director** **General, AILSG**



Solid waste management is universally a municipal subject, but water supply and sewerage remain under municipal control only in Maharashtra, Gujarat, and Madhya Pradesh; other states use parastatal agencies, resulting in fragmented governance and highlighting the need for collaborative platforms. Sanitation is now a major economic priority, with health and education replacing military as the top areas of public expenditure; sanitation accounts for 2.5% of budgets, delivering an estimated ₹5.50 return per rupee spent. Municipal sanitation and water supply are multidisciplinary domains that require coordinated efforts mainly from civil, mechanical, electrical engineers, unlike road construction, which is predominantly handled by civil engineers. The Chief Engineers' Forum, guided by the Joint Secretary for Swachh Bharat Abhiyan, aims to foster ongoing collaboration and shared learning to advance India's sanitation

infrastructure. He further expressed AILSG's commitment in taking ahead this initiative jointly with CPHEEO and MOHUA.



Inaugural Address by **Smt. Roopa Mishra, National Mission Director, SBM (U) and Joint Secretary, MoHUA**



She emphasized the need for an apex body, like the Indian Roads Congress (IRC), to establish consistent national standards in solid and liquid waste management. The current Chief Engineers Forum could evolve into a broader “Engineers Forum for Swachh Bharat,” with a mandate to identify sectoral challenges, drive R&D through technical institutions, and set clear operational and design benchmarks. Drawing insights from 500+ technology providers at IFAT, she underscored the urgency of mainstreaming proven technologies, while addressing procurement norms, limited O&M capacity in ULBs, and the quality standards. She recommended formalizing the forum with a structured charter and annual or bi-annual meetings, forming regional sub-forums for focused discussions, and aligning activities with national sanitation priorities and stakeholder participation. She concluded by expressing

gratitude to AILSG Mumbai for ideating and leading this initiative and wished success in establishing a robust public health engineering platform inspired by the IRC, supporting Swachh Bharat’s vision.



Inauguration of the first roundtable by esteemed Chief Guests



Officiated the Chief Engineers' Forum for Swachh Bharat by Launch of the Logo



Under the aegis of Swachh Bharat Mission (U)

Chief Engineers' Forum for Swachh Bharat

The inaugural roundtable was divided into two sessions –

1) Sustainable Used-Water Management

(moderated by Shri. Rohit Kakkar, Deputy Advisor, PHEE, CPHEEO)

2) Sustainable Solid Waste Management

*(moderated by Shri. Shri. J.B. Ravinder, SWM Policy Expert SBM(U) and
Retd. Joint Adviser, PHEE, CPHEEO)*



Session

1

Sustainable Used Water Management (UWM)

Chaired by: Bilash Kumar Behera, Engineer in Chief, Orissa Water Supply and Sanitation Board

Moderator: Mr. Rohit Kakkar, Dy. Advisor (PHEE), CPHEEO, MoHUA



Context Setting by **Shri. Rohit Kakkar, Dy. Advisor (PHEE), CPHEEO, MoHUA**



CPHEEO continues to learn from the experiences of developed nations, drawing on global best practices and lessons from past shortcomings to guide India's future WASH initiatives. He highlighted the organized infrastructure transformation achieved over the past decade through SBM (U), noting CPHEEO's role as the technical wing of MoHUA in reviewing DPRs from over 4,000 cities. A key challenge identified was the adoption of widely differing engineering approaches by cities with similar conditions, often without adequate technical justification. Emphasizing the need for informed and consistent decision-making, CPHEEO proposed creating a platform where chief and city engineers could share experiences, discuss contextual approaches, and promote peer learning. Mr. Kakkar credited the initiative's realization to the guidance of the Joint Secretary, MoHUA, and the efforts of

AIILSG, Mumbai, MoHUA's Swachhata Knowledge Partner, for organizing the inaugural forum at IFAT India. He concluded by thanking AIILSG and IFAT for their collaboration and expressed hope that the forum will become a sustained platform for encouraging knowledge exchange in the sanitation sector.

Theme 1: National Effluent and Reuse Standards

- a) Implementation of stringent discharge standards significantly increases both capital expenditure and O & M costs. Revisions render many existing STPs either redundant or in need of costly retrofitting. Even large urban local bodies find compliance challenging, making it considerably more difficult for smaller towns.
- b) A major portion of treated water is used for agriculture, where stringent standards may not be essential. While NGT norms mandate low nitrogen and phosphorus levels, these nutrients are required for soil enrichment. As agricultural demand fluctuates seasonally, any relaxation of standards for agricultural use must be accompanied by alternate reuse strategies and corresponding mechanisms for maintaining standards during the periods of low demand.
- c) Dilution can be viewed as coping mechanism for stringent reuse norms. However, it requires clean water sources and may not work in majority of the cities. Also, consideration of bioaccumulation and biomagnification was advised for reuse.

- d) It was noted that while CPHEEO and CPCB guidelines assume influent BOD levels of about 250 mg/L, small and medium towns typically receive sewage with BOD between 50 and 100 mg/L and variable volumes.

Key areas for intervention

The uniform effluent discharge standards may lead to STP underperformance or failure. It was emphasized that the discharge standards should be –

- **Adaptive and practical (Technically and Financially)**
- **Tailored to local conditions such as geography, population scale, and financial capacity**
- **Reuse standards should be focussed on end use, service coverage, and O&M efficiency rather than strict uniformity.**
- **A 10-year O & M contract model** to ensure better operational performance and infrastructure sustainability.

Theme 2: Cost Variations for Similar Technologies Across States

- a) Cost variations were noted across states due to general reasons like differences in geography, transport accessibility, legal frameworks, and labour costs. Apart from these the key reasons for cost variations include –
- Political influence in the tendering process
 - Discrepancies between project planning and execution phases
 - Delays from contractors, leading to further escalation of costs.
 - Limited interest among the private implementing agencies to take up smaller scale STPs for smaller cities / decentralised STPs.
 - Multiplicity of departments and unclear role demarcations causing coordination issues, and the lack of detailed land maps affects planning and accurate sewer layout implementation.
 - Lack of knowledge and lack of standardization of technologies across the levels
- b) In this case, **standardization of costs / rates will be helpful** especially in the case of Non-schedule items for STPs. Suggested means for standardizing rates are -
- Develop standard designs, and quantities of material required for different sized treatment plants based on different technologies. ULBs can use these defined quantities together with their state's scheduled of rates to get the final cost of the project.
 - **Empower ULBs to define their own context-specific rates**, as they best understand local needs and constraints.
 - **Establishment of a national dashboard** to monitor STP capital and operational costs
 - Enhance transparency and efficiency by **standardizing the process for selecting implementing agencies, publication of approved technologies with indicative per MLD costs** (including non-schedule STP items), and **benchmarking technology performance across states**.
 - **Regular performance reviews**, documentation of best practices,
 - **Imposition of penalties** for project delays for accountability and implementation outcomes.

Key areas for intervention

- 1) To standardise and define the processes used in different STP technologies. Develop standardized design (clearly defining and fixing size all the components) of various technologies. Schedules of rates must be updated to encompass all process elements.

- 2) To include primary treatment / sedimentation tank in all the STPs, owing to higher amount of solids in wastewater received
- 3) In small towns where underground drains are absent, covered surface drains should be provided for conveying wastewater, and clear, phased guidelines should be developed for process-level standardization of hybrid (mechanised and nature-based) systems that respond to increasing urbanization and infrastructure demands.

Theme III: Sewered vs Non-Sewered Systems in Urban Areas

- a) Historically congested cities such as London and Paris have managed extensive sewerage infrastructure despite their density. This issue is particularly critical for small towns under the Swachh Bharat Mission, which will become more congested over time; implementing sewerage now is vital to avoid future constraints as these towns grow.
- b) Lengthy approval processes, often stretching beyond ten years, along with regulatory changes such as increased FSI, delay in land acquisition may render existing drainage and treatment plans obsolete. As an interim measure, employing smaller zonal sewerage plans within towns can improve resource utilization and facilitate future growth as these towns expand.
- c) On-site sanitation shall be preferred particularly for isolated areas where laying conventional sewers is impractical due to technical constraints in dense urban settings. Approaches should be responsive as towns evolve.
- d) Utilizing trenchless methods like Horizontal Directional Drilling (HDD) or Micro-tunnelling will help overcome the limitations posed by narrow streets, enabling separate sewage collection and treatment. Combined sewer systems create operational difficulties during monsoons, so employing sustainable, separate systems even for small towns ensures sustainable sanitation infrastructure.

Key areas for Intervention

There is no universal model for India. Strategies must be tailored to local conditions, population, resources, and growth patterns. For rapidly growing tier II towns, robust regulations for private players and housing societies on sewage and effluent discharge are necessary along with following-

- A phased approach for small towns can gradually connect households to sewerage network, minimizing redundant infrastructure and ensuring timely fund allocation.
- Clear norms delineating roles and authority among departments such as Sewerage, Stormwater, and Public Works are essential for coordinated sewer laying operations. Planning new developments with utilities like gas and drinking water installed prior to construction supports uniform infrastructure layout.
- Policy guidelines should be tier-specific to improve sewage collection efficiency. Master Plans for drainage and sewerage should be developed and periodically updated to guide future projects. To optimize land use, vertical space solutions like vertical STPs should be encouraged.

Session

2

Sustainable Solid Waste Management (SWM)

Moderator: Shri. J.B. Ravinder, SWM Policy Expert SBM(U) and Retd. Joint Adviser (PHEE), CPHEEO.



Introduction to the session by **Shri. Shri. J.B. Ravinder, SWM Policy Expert SBM(U) and Retd. Joint Adviser (PHEE), CPHEEO**



Shri Ravinder mentioned that like UWM, SWM also to develop standards for different classes of ULBs in varying geographical context regarding the waste treatment/processing options, suitable infrastructure, costs, standard BID documents and methods of bidding. As most ULBs except for million plus population ones, lack the required technical, financial and administrative staff, expertise and resources, centralized bidding at State level adopted by certain States is proving beneficial to SWM sector. As Swachh Bharat Mission (U) has just 1 year left in the mission period, it is essential to focus on the mission outcomes of -

- (a) 100% segregation of waste at source
- (b) 100% door to door collection
- (c) 100% treatment & processing
- (d) complete legacy waste remediation
- (e) ensuring only scientific/ sanitary landfilling
- (f) achieving minimum 3-star garbage free star rating etc.

SWM is more challenging than UWM as it is the shared responsibility of Citizens and ULBs. Infrastructure connected to waste generators does not get activated by a flush-button but requires everyday involvement of citizens in segregation, safe storage, ensuring waste pick up, no-littering etc. these vital contributions by citizens require, besides infrastructure and reach of MSWM system the second aspect of enforcement of SWM Rules upon citizens, staff, informal sector, contractors and operators etc. Progress ahead has to encompass these aspects with ULBs' road maps for increased processing- reducing landfilling; training and empowerment of staff; continuous behaviour change communications and practices; no-cost and low-cost interventions such as BWG compliances; efficiency of C&T systems commensurate with targeted segregated wastes & high-grade processing; framing byelaws, user fees and machine capture of data.

The Chief Engineers and City Engineers deliberated on the said issues and came up with suggestions as follows:

- a) Source segregation at the household level remains a significant challenge which exacerbates low grade processing and presence of untreated waste landfills and the substantial volume of construction and demolition (C&D) waste. Although conventional waste management practices such as wet waste composting and material recovery facilities (MRFs) are common, there is a pressing need to intensify efforts on citizen sensitization about segregation practices for recovery of higher value resources towards circular economy.
- b) To address collection challenges, household-level segregated waste collection utilizing small vehicles becomes critical, especially in areas with narrow roads. Alongside this, the systematic collection of C&D waste beyond the building permit system.
- c) As C&T system provides the vital connection with all waste generators, it needs to have mapping of fleet and staff movements; daily monitoring, regular improvements, modifications and upgrading through digital monitoring tools. In large cities the ICCCs are essential.
- d) The same digital C&T system should enable efficiency & compliance of staff, enforcement of anti-littering and anti-dumping regulations.
- e) Comprehensive sensitization programs targeting both citizens and technical staff are essential, given the inconsistencies in current execution. While multiple IEC agencies operate across different zones, and initiatives such as recognition of waste pickers and involvement of sanitary inspectors help promote source segregation compliance, significant gaps persist in empowering technical staff to meet operational demands. This highlights the need for specialized training programs, potentially developed by expert organizations like AIILSG, to bridge these capacity gaps.
- f) Numerous urban local bodies (ULBs) have formulated roadmaps aligned with the Swachh Bharat Mission Urban 2.0 objectives, striving for 100% door-to-door collection, segregation, scientific processing, remediation, and landfill management. These shall be monitored for level of achievements in monthly report card format displayed in public domain.
- g) Regarding procurement, a collaborative approach combining centralized bidding at the state level with active ULB participation can ensure better pricing, warranty assurance, and more timely infrastructure implementation.
- h) Adapting waste collection schedules like shifts in street sweeping to night-time operations could optimize high grade resource recovery such as CBG from bio-methanation and support a circular economy approach encompassing both wet and dry waste.
- i) Pilot projects experimenting with phased waste collection and modified schedules in larger cities in 24-hour format could serve as models for field validation and adoption. Street sweeping for example has progressed to night-time operations also in the last 1-2 decades
- j) Strengthening no-litter policies, including regulating commercial & business spaces having street interfaces for providing segregated waste bins to prevent littering and improper waste disposal, is also necessary. It should be coupled with strong monitoring of violators and enforcement of fines and penalties.
- k) Linkage between byelaws and property tax and/or trade license system may be implemented to strengthen the ULBs capacity to impose penalties and recover them.



- l) ULBs need to develop road maps for achievement of SWM Rules compliance and outcomes of SBM(U).
- m) SWM departments shall be set-up in every ULB. For small ULBs District or Taluk level departments may be set up duly ensuring staffing.

Key areas for Intervention

To enhance sanitation management, it is imperative that ULBs provide social protection, dignity, and elevated status to both sanitation and informal waste workers. Platforms such as the Chief Engineers Forum are well-positioned to embed these objectives within local governance frameworks, particularly in smaller towns, fostering inclusive and sustainable urban sanitation initiatives.



Immediate Way Forward

- 1) Converting the discussions of the Roundtable to a **Policy Recommendation** Note, contributing to the upcoming phase of SBM- U.
- 2) **Structuring the “Forum” and its work plan** - formalizing the forum with a structured charter and annual or bi-annual meetings, forming regional sub-forums for focused discussions, and aligning activities with national sanitation priorities and stakeholder participation.
- 3) **Establishing the Taskforce** of selected Chief/City PHEs, retired PHEs and Subject Experts for continued deliberations and policy contributions.
- 4) **Planning for upcoming Roundtables** with Chief Engineers – on the IFAT and other platforms and other key calendar events to maintain momentum and broaden engagement of stakeholders.
- 5) Working to expand “Chief Engineers Forum for Swachh Bharat” to **“Engineers Forum for Swachh Bharat”** to reflect its mandate and inclusivity, positioning it as a premier technical platform for advancing sanitation policy and practice nationwide.

Photo Gallery



Snippets of the Roundtable Discussion

Photo Gallery



Token of Appreciation for Valuable Contribution at the Roundtable



Group Photo of the Roundtable Participants and Esteemed Chief Guests



**Thank you for being part of
our **100 years** journey!**



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