



PARVAT-MANTHAN
Manifestation of Clean and Sustainable Hill States

Peer-to-peer Learning cum Exposure visit on Inclusive and climate sensitive WASH practices

LEH, LADAKH
20TH- 24TH AUGUST 2024

PROCEEDINGS





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Background

Over the last decade, the sanitation landscape of India has been rapidly changing, with progressive laws, programmes, and policies. With the success of SBM (1.0), the Government of India introduced aspirational missions such as SBM 2.0 and Jal Jeevan Mission (JJM-U), which aspire to go beyond eliminating open defecation in the country by focusing on ODF+, ODF++, and Water+ protocols as laid down by the Ministry of Housing and Urban Affairs, Government of India.

However, with the advent of different schemes, the planning format was changed from the initial idea of the City Sanitation Plan (National Urban Sanitation Policy, 2008) to detailed project reports of sanitation infrastructure. Furthermore, the existing capacities and attitudes of local planners, consultants, and decision-makers still follow a one-size-fits-all top-down approach and therefore have yet to meet the standards of the emerging concept of Citywide Inclusive Sanitation (CWIS) approach, which aims to achieve the urban sanitation targets envisioned in Sustainable Development Goal (SDG) 6 in an equitable way. CWIS comes with six important principles: while the first three principles, equity, safety, and sustainability, attempt to address urban sanitation holistically; the next three principles, namely responsibility, accountability; and resource planning and management try to prepare urban sanitation with well-equipped service outcomes. Therefore, CWIS looks to shift the urban sanitation paradigm, aiming to ensure everyone has access to safely managed sanitation by promoting a range of solutions. The urban sanitation scenario needs to be closely looked from a holistic perspective because the existing situation is exacerbated by emergent climate change issues.

Leh, a mountainous city, is situated at a height of 11,000 feet in Northern India. Exponentially increasing tourist footfall has led to a tremendous increase in local incomes but is not matched by a commensurate increase in municipal infrastructure, impacting the quality of everyday life for residents and tourists. This is compounded by long-term impacts such as water scarcity, dwindling farms, livelihoods etc. The government of the Union Territory of Ladakh has taken multiple steps in the last few years to address these issues. A microcosm of the water and sanitation issues and potential solutions are visible in Leh, Ladakh, India. These steps are collaboratively taken with residents and are based on the long-term vision of a "Happy Liveable Leh".

National Institute of Urban Affairs (NIUA) is a premier institute of the Ministry of Housing and Urban Affairs (MoHUA), Government of India, for research and capacity building for the urban sector in India. Established in 1976, NIUA's broad objective is to bridge the gap between research and practice on issues related to urbanisation. NIUA through its hill forum 'Parvat Manthan - Manifestation of clean and sustainable hill states' is supporting the Indian Himalayan Region (IHR) in addressing the septage management, used water and solid waste management challenges through the lens of inclusivity and climate resilience.

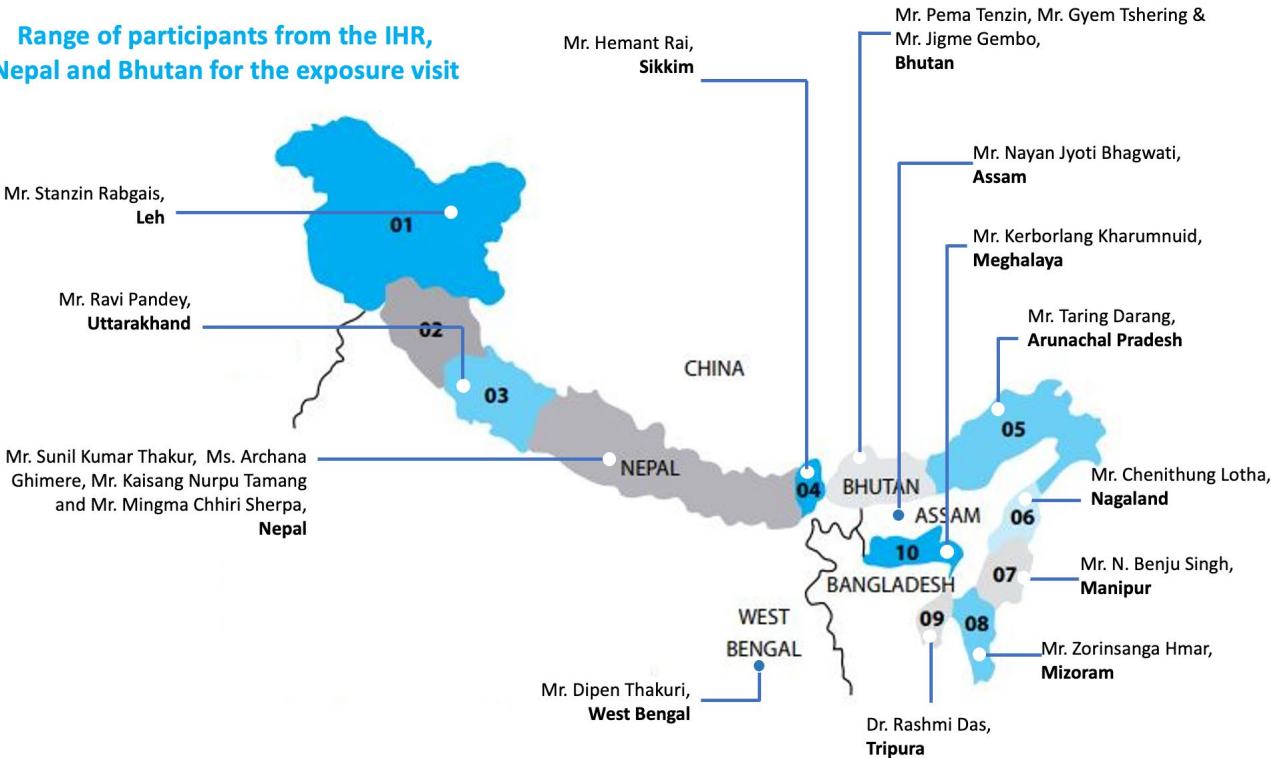
The forum aims to bring together the collective voice of the eleven States and two Union Territories of the IHR where they can convey their challenges and solutions for enabling and ensuring inclusive and climate resilient sustainable sanitation in the region.

In this regard, the Sanitation Capacity Building Platform (SCBP) of NIUA in collaboration with its partners namely National Faecal Sludge and Septage Management (NFSSM) Alliance, Bremen Overseas Research and Development Association (BORDA-South Asia), International Centre for Integrated Mountain Development (ICIMOD), Ladakh Ecological Development Group (LEDeG) organised a peer-to-peer learning cum exposure visit from 20th to 24th August 2024 with an emphasis on showcasing the efforts undertaken in Leh towards achieving inclusive sanitation to the senior government officials of the IHR, Nepal and Bhutan including participation from organisations working in the Himalayas.

The objective of the exposure visit were as follows:

- ▶ Familiarise senior officials with the principles of Citywide Inclusive Sanitation (CWIS)
- ▶ Share best practices and case studies from Leh’s inclusive urban sanitation initiatives
- ▶ Explore innovative and contextual approaches to septage and waste management in mountainous terrain, through the work done in Leh

Range of participants from the IHR, Nepal and Bhutan for the exposure visit



Range of officials who participated in the exposure visit from the IHR, Nepal and Bhutan

Inaugural Session



Smt. Debolina Kundu
*Director (Additional Charge),
NIUA*

Emphasised that the Indian Himalayan Region (IHR) has been subjected to rapid and unplanned urbanisation, which has resulted in the development of sprawls and has also impacted the microclimate and hydrological regimes of Himalayan watersheds along with groundwater rechargeability. Climate change has further exacerbated the problems and challenges. The abysmal shift in water availability has direct implications on the Water Sanitation and Hygiene (WASH) sector while also echoing the need for integrated resilient strategies and solutions to address the impacts of climate change. The ongoing work by the Sanitation Capacity Building Platform (SCBP) at NIUA on Inclusive Sanitation in the Hill State of Uttarakhand and Darjeeling aims to disseminate the learnings and challenges to other hilly states through the Parvat Manthan Forum and initiate a peer-to-peer learning and knowledge exchange.

She highlighted the significance of collaboration to enhance understanding and capacities in urban water and sanitation practices, while also continuing the collaboration for knowledge beyond the event, ensuring that the lessons and connections forged will have lasting impact.



Dr. Mahreen Matto
Team lead, SCBP, NIUA

Shared the background of water and sanitation management through the lens of climate change and emphasised the timely conceptualisation of the Parvat Manthan Forum and its aim to collectively work towards making hill cities and towns inclusive and climate-resilient.



Shri Eshay Tondup
Executive Director, LEDeG

Welcomed the officials and emphasised the importance of sharing experiences to strengthen the capacities of stakeholders of Leh and other regions in addressing inclusive sanitation. He highlighted that collaboration across regions would help identify innovative, localised solutions to the challenges posed by climate change and urbanisation in mountainous areas.



Shri Stanzin Rabgais
*Executive Officer, Municipal
Committee, Leh*

Thanked everyone for visiting Leh and emphasised the mutual benefits of the exposure visit. He expressed that Leh would also gain valuable insights from the practices and strategies employed in other Himalayan regions, fostering a two-way learning process through these conversations.

Day 1

22nd August 2024

1) Legacy Waste Remediation, Bomb Guard

In recent years, Leh faced significant challenges with legacy waste management, particularly in the Bomb Guard area. Legacy waste, accumulated over decades, had become a pressing issue, with the local Material Recovery Facility (MRF) struggling to cope with the increasing volume. During peak tourist seasons, waste generation surged to 40 tonnes per day (TPD), overwhelming the MRF's capacity and resulting in temporary measures such as burning waste. Recognising the need for a sustainable solution, the Municipal Committee Leh, in collaboration with BORDA and LEDeG, initiated a comprehensive legacy waste remediation project.

The project focused on remediating the accumulated waste at Bomb Guard through advanced techniques and integrated waste management strategies. The remediation process involved the excavation and treatment of old waste piles, the implementation of composting and recycling initiatives, and the establishment of new waste management practices. The facility was designed to address both the immediate challenges of legacy waste and to set a precedent for future waste management in Leh. Key features included state-of-the-art composting units, recycling stations, and extensive community engagement to encourage proper waste segregation.

Insights from the participants:

- ▶ **Government support:** Municipal Committee Leh officials commended the project's success, attributing it to strong government support and effective collaboration between local authorities and NGOs. They highlighted the importance of coordinated efforts in managing legacy waste and the establishment of sustainable practices.
- ▶ **Environmental impact:** IHR representatives praised the environmental benefits of the remediation project, noting its significant reduction in landfill pressure and promotion of a circular economy. They emphasised that the innovative use of composting and recycling technologies contributed to improved waste management outcomes.
- ▶ **Community engagement:** Bhutanese officials noted the project's effectiveness in engaging the local community, which played a crucial role in the success of the remediation efforts. They suggested that continued community involvement and education are essential for maintaining the effectiveness of waste management practices.
- ▶ **Scalability and replication:** Nepalese representatives saw the Bomb Guard model as a promising approach for other mountain towns facing similar legacy waste issues. They recommended adapting the project's strategies to local contexts and scaling the model to address legacy waste in other regions with comparable challenges.



Participants at the Bomb Guard site



Remediated legacy waste site of Bomb Guard

2) FSTP, Bomb Guard

The Faecal Sludge Treatment Plant (FSTP) in Leh, operational for the past eight years, represents a landmark project addressing critical sanitation issues in the region. Prior to the establishment of the plant in 2015, Leh relied solely on septic tanks, leading to widespread contamination, with studies showing that 90% of borewells were affected. Additionally, high rates of waterborne diseases, including diarrhea, were observed, particularly during the summer months.

The FSTP was built in just 52 days with support from BORDA, after a government-led initiative inspired by a visit to Devanahalli's FSTP in Bangalore. The facility uses technology tailored to mountainous conditions and processes 2500 litres of faecal sludge per day, handling around 30 trips daily. The plant has treated over 2 crore litres of faecal sludge and produced 1 crore litres of reusable wastewater, making a significant impact on public health and initiating a dialogue around sanitation and wastewater management in Leh. The capital cost for the plant was ₹5 lakh per KLD, with an operational cost of ₹75,000 per month, funded sustainably through fees collected per trip.

Key learnings from this project include the importance of government buy-in, which was essential to ensure smooth operation and continuous involvement in solving issues of containment and untreated waste. The plant demonstrates how technology must be adapted to local conditions, particularly in mountainous regions, to be effective. Officials noted the plant's financial sustainability as a model for replication, though they emphasised the need for scaling the technology to address the remaining untreated waste in the area.

Insights from the participants:

- ▶ **Scalability and replication potential:** Officials from Nepal and Bhutan were particularly impressed with the scalability of the plant as similar model has been implemented in Kargil, and expressed interest in replicating the technology in their respective mountain regions.
- ▶ **Technology adaptation:** IHR officials commented on the efficiency of using mountain-specific technology and emphasised that similar adaptations would be necessary for other high-altitude regions.
- ▶ **Public awareness:** Some officials suggested increasing efforts toward public awareness and capacity building, especially around proper waste management and health impacts.
- ▶ **Public-private partnerships (PPP):** The involvement of private partners in O&M was seen as a best practice, highlighting the need for clear roles in future replications.



Participants at the Leh FSTP site



Participants understanding the working of the FSTP

3) Decentralised Wet Waste Composting Unit

The Decentralised Wet Waste Composting Unit in Leh was established to address the growing pressure on the Material Recovery Facility (MRF), which has exceeded its designed capacity of 30 TPD, often handling up to 40 tonnes during peak seasons. While legacy waste has been remediated, the increasing volume of new waste—particularly from the urban areas of Lower Leh—necessitated a more localised waste management solution. Inspired by the Ambikapur model, Leh's composting unit has been adapted for its harsh climate, incorporating greenhouses and aerated composting tanks to optimise the process.

The facility collects wet waste twice a week, which is then segregated, shredded, and composted. Sawdust is used as a carbon source, and natural enzymes like jaggery are added to reduce odor and improve the compost quality. The composting process varies seasonally, taking 1 month in winter and 15 days in summer. The unit, equipped with 8 composting tanks, produces around 100 kg of fine-quality compost each month, which is sold for ₹200-750 per kg. The leachate generated during the process is either pumped into the Faecal Sludge Treatment Plant (FSTP) or reused in the composting tanks.

The composting unit was set up with a capital cost of ₹9,00,000, however the cost may vary in other regions. Monthly operational costs are around ₹34,000, primarily for salaries, transport, and the procurement of natural enzymes, while the sale of compost generates ₹10,000 to ₹40,000 monthly. Managed by the Municipal Corporation of Leh (MCL), this decentralised facility significantly reduces landfill waste and lowers CO₂ emissions, while also creating local employment opportunities.

Key learnings from the facility include the effectiveness of decentralised waste management in mountain regions, which is both economically and environmentally efficient. Officials noted the need for customised solutions based on the specific waste generation patterns of different areas, emphasising expert consultation to adapt the technology.

Insights from the participants:

- ▶ **Waste segregation awareness:** Nepalese officials highlighted the importance of public awareness campaigns to ensure proper segregation of waste at the source.
- ▶ **Odor control:** Bhutanese representatives appreciated the use of natural enzymes like jaggery for odor control, suggesting further innovations in this area for better urban applications.
- ▶ **Economic viability:** IHR officials discussed scaling compost sales and increasing community participation to enhance the financial sustainability of the project.
- ▶ **Climate adaptation:** Officials recognised the facility's innovative approach of the use of greenhouses and aerated tanks to manage the composting process, especially during harsh winters, praising it as a model for other cold regions.



Participants at the composting unit in Leh

4) Greenhouse Pilot, Bomb Guard

Originally conceived as a commercial floriculture greenhouse, the project at Bomb Guard aimed to capitalise on Leh's growing floriculture industry by creating an aesthetically pleasing, revenue-generating facility. The greenhouse, completed in 2020, was designed to leverage climate-controlled conditions for cultivating high-quality flowers, catering to both local and regional demand. However, as the facility developed, it faced an unexpected opportunity: the availability of treated wastewater from nearby facilities such as the FSTP prompted a shift in focus.

The project has since evolved into a research site for testing hydroponics—a method of growing plants without soil, using nutrient-rich water. This shift from floriculture to vegetable cultivation is a pilot initiative that aims to explore whether treated wastewater can be effectively and safely used for growing food. All chemical and biological parameters of the treated wastewater were thoroughly tested, confirming its safety for agricultural use. However, a critical challenge remains: market acceptance. A major focus of the ongoing research is to determine whether consumers will be willing to purchase vegetables grown using treated wastewater.

The pilot project is a forward-looking attempt to understand the potential for expanding vegetable production in Leh using hydroponic methods and wastewater reuse. Beyond the greenhouse, treated wastewater is already used in agriculture, landscape irrigation, and industrial processes worldwide, including in countries like Israel, Spain, and the USA.

Key learnings from this facility include the necessity of thorough water quality testing and community engagement to ensure public acceptance of produce grown with treated wastewater. The visiting officials noted the importance of expanding public awareness and testing consumer willingness to adopt such products.

Insights from the participants:

- ▶ **Market feasibility:** Bhutanese officials raised questions about market adoption and suggested creating awareness campaigns to promote the benefits of using treated wastewater for food production.
- ▶ **Replicability:** Nepalese representatives appreciated the innovative use of hydroponics in a mountain region and discussed the potential for replicating this model in other high-altitude areas.
- ▶ **Public health:** IHR officials emphasised the need for continuous monitoring of wastewater quality and public health safety as key considerations for future expansion of such projects.
- ▶ **Environmental sustainability:** The use of treated wastewater was praised for reducing pressure on freshwater sources, making the project more environmentally sustainable and in line with water resource management strategies.



Participants at the Greenhouse pilot site

5) 24x7 Water Supply, Ganges

In the challenging high-altitude region of Leh, ensuring a reliable water supply is a significant challenge, especially during the harsh winter months when traditional water pipes are prone to freezing. The 24x7 water supply project at Ganges was initiated to address these challenges and provide a consistent water supply to 64 households in one of the highest altitude areas of Leh. This region was chosen specifically due to its extreme altitude, making it a critical site to test and implement all-weather water supply solutions.

The project involved the installation of innovative water supply infrastructure designed to withstand Leh's severe cold weather. The system features insulated and heat-retaining pipes, advanced frost-proofing techniques, and climate-adaptive technology to prevent freezing. By employing these solutions, the project ensures that residents have continuous access to water throughout the year, regardless of the extreme temperatures.

Insights from the participants:

- ▶ **Infrastructure resilience:** Officials highlighted the project's success in creating a resilient water supply system. They praised the use of advanced insulation and frost-proofing techniques, which have effectively prevented pipe freeze-ups, ensuring reliable water access even in the harshest conditions.
- ▶ **Community impact:** IHR representatives emphasised the positive impact on local households, noting that the 24/7 water supply has significantly improved residents' quality of life. The project has alleviated the challenges associated with water scarcity and has enhanced the overall living conditions in the high-altitude area.
- ▶ **Technical innovation:** Bhutanese officials commended the project's technical innovations, which have set a new standard for water supply systems in high-altitude regions. They expressed interest in the potential to replicate these solutions in other mountainous areas facing similar challenges.
- ▶ **Sustainability:** Nepalese representatives appreciated the project's contribution to sustainable water management in extreme climates. They emphasised the importance of ongoing maintenance and monitoring to ensure the long-term effectiveness of the infrastructure and recommended incorporating these practices into future projects.



Participants at a house in Ganges with 24x7 water supply

Day 2

1) WASH facility

In 2020, sanitation workers in Skampari faced severe challenges due to inadequate living conditions and limited access to essential services. Many resided in informal settlements lacking proper water and sanitation facilities, exacerbating their health risks, especially during the pandemic. Despite these hardships, these workers continued their critical roles, prompting BORDA and LEDeG, with support from the Municipal Committee Leh, to address these urgent needs.

The result was the development of a comprehensive WASH (Water, Sanitation, and Hygiene) facility specifically designed to improve the working and living conditions of Skampari's sanitation workers. This facility provides essential amenities such as toilets, bathing areas, clean drinking water, and laundry facilities, all tailored to meet the extreme cold weather conditions typical of Leh. Key features include solar-heated water systems, insulated plumbing, and heat-retaining walls, ensuring comfort and functionality even in harsh climates.

Insights from the participants:

- ▶ **Government support:** Officials from the Municipal Committee Leh emphasised the crucial role of government support in the project's success. They highlighted the importance of their involvement in providing land, legal support, and oversight, which were vital for the facility's operational stability.
- ▶ **Climate adaptation:** IHR representatives praised the facility's adaptation to Leh's extreme climate. They noted the innovative use of solar heating and insulated plumbing as effective solutions to the challenges posed by cold weather.
- ▶ **Impact and replication:** Bhutanese officials lauded the facility for significantly enhancing the working and living conditions of sanitation workers. They discussed the potential for replicating this model in other mountainous regions, suggesting that similar adjustments to technology and stakeholder engagement could be beneficial in comparable settings.
- ▶ **Community benefits:** Nepalese officials highlighted the positive impact on worker dignity and job satisfaction, noting that the facility not only improves hygiene but also contributes to better work efficiency and overall well-being. They encouraged continued efforts to promote such models across other areas with similar socio-economic conditions.



Participants at the WASH facility for sanitation workers in Skampari

2) 3R Facility, Main market

The 3R Waste Management Unit in Leh was developed in response to the challenges faced by the Material Recovery Facility (MRF), which had become overstretched due to fluctuating waste volumes. Originally designed to handle 30 TPD of waste—20 TPD dry and 10 TPD wet—the MRF struggled to cope with peak tourist season waste surges of up to 40 TPD, while managing significantly lower volumes of 8 TPD in winter. This overburden led to difficulties such as hiring temporary workers and unauthorised disposal methods. To address these issues, an integrated approach combining the principles of Reduce, Reuse, and Recycle (3R) with a new composting unit was introduced.

The facility operates in a park setting, designed to be visually appealing and engaging rather than resembling a traditional dump yard. It focuses on recycling materials such as cardboard, PET bottles, cloth, and cans, with added incentives for the community to participate. Items like recycled clothing are distributed to migrant workers at no cost, while other recycled goods are exchanged for products like bags and wallets. The waste is brought in by community members, who self-segregate it before the operators check, weigh, and sell the high-quality recyclables to buyers. Future plans include expanding the unit's scope to include e-waste, utensils, and woolen items, based on demand.

Insights from the participants:

- ▶ **Community engagement:** Bhutanese officials commended the unit for its effective community engagement and participatory approach. They noted that the incentives provided have successfully motivated local involvement in waste segregation and recycling efforts.
- ▶ **Scalability and replication:** Nepalese representatives were impressed by the unit's model and its potential for replication in other mountain towns. They emphasised that the decentralised approach and the inclusion of incentives could be adapted to suit different local contexts.
- ▶ **Environmental impact:** IHR officials highlighted the positive environmental impact of the unit, particularly its role in reducing landfill pressure and promoting a circular economy. They encouraged further development and scaling of such models in similar high-altitude regions.
- ▶ **Operational challenges:** Several officials noted the initial challenge of low community participation and praised the extensive IEC campaigns that successfully addressed this issue. They suggested that continuous community engagement and education would be key to maintaining and improving the unit's effectiveness.



Participants at the 3R facility

3) All- Weather Public Convenience, Zangsti

The Zangsti Public Toilet Complex was developed to address the urgent need for year-round sanitation facilities in Leh, especially during the peak tourist season. Leh's cold desert climate made conventional flush toilets non-functional in winter, leading to serious public health concerns. Recognising this, local authorities, in collaboration with BORDA and LEDeG, designed an all-weather public toilet facility that could withstand the region's extreme conditions.

The facility, located in a high-traffic area of Zangsti, integrates eco-friendly construction methods such as insulated walls, mud plaster, and passive solar heating techniques to prevent freezing. Additionally, it includes a café and a sales outlet run by the NGO PAGIR, creating a multifunctional space that helps reduce the stigma around sanitation work as a whole. By combining a sanitation facility with social entrepreneurship, the project ensures a self-sustaining operation through revenue generated from the café and art shop.

Insights from the participants:

- ▶ **Innovative design:** Nepalese officials appreciated the facility's design, particularly its use of passive solar heating and eco-friendly materials. They mentioned that the innovative insulation techniques could serve as a model for other cold, high-altitude regions facing similar challenges.
- ▶ **Social integration:** Bhutanese representatives praised the incorporation of the café and sales outlet, noting that it not only supports local artisans but also helps normalise the use of public toilets, reducing the stigma surrounding sanitation work.
- ▶ **Sustainability:** IHR officials highlighted the sustainable operation and maintenance model. They were impressed by how the revenue generated from the café and shop offsets the running costs, ensuring the facility's long-term viability without reliance on external funding.
- ▶ **Year-round functionality:** Several officials remarked on the importance of designing public infrastructure that remains operational throughout the year, especially in regions with harsh winters. They emphasised that this facility serves as an excellent example for other mountain towns looking to upgrade their sanitation services.



Participants in the cafe at the All- Weather Public Convenience in Zangsti



The All- Weather Public Convenience in Zangsti

Expectancy mapping session: Potential working areas for short, medium and long term

Uttarakhand:

- ▶ Support for designing of contextualised technology/ vehicles for septage extraction from depths of upto 40m
- ▶ Efficient transportation of RDX for pyrolysis

Assam:

- ▶ Support for designing DPRs
- ▶ Capacitating municipal level officials
- ▶ Localised, nature-based solutions

Darjeeling:

- ▶ Support for remediation of the legacy waste site in Darjeeling

Meghalaya:

- ▶ Support requested for treatment of used water

Bhutan:

- ▶ Documenting indigenous practices and community engagement initiatives
- ▶ Scaling and replicating of sanitation and water supply interventions

Sikkim:

- ▶ Standardising re-use of used water and circularity



Participants during the expectancy mapping session

Way-forward

The peer-to-peer learning cum exposure visit programme initiated a dialogue to focus on three key thematic priorities:

- ▶ The focus on models and best practices for legacy solid waste management – especially with regards to cost calculations and contracts for private sector participation
- ▶ Policies and guidelines for used water management with a focus on informing for unique O&M costs for hilly regions keeping in mind terrain and climate constraints
- ▶ Documentation on unique local technologies for solid and liquid waste management; in addition to any community led models created to support livelihood generation in tandem with waste management.

To take this forward in an actionable manner, the Parvat Manthan secretariat along with its partners will take a three pronged approach:

- ▶ **Sharing of learning docket** – basis the site visit, a digital docket will be shared with model contracts, SoPs,DPRs, project outlines etc. where available to provide supporting material to give a picture of what it takes to implement such best practices in real time
- ▶ **Conducting a regional conference for hilly cities** – the Parvat Manthan along with its alliance partners is looking forward to hosting a regional conference this year for all the states/countries present at Leh. The purpose of this conference is to further deep dive into the three focus areas above as well as bring in sector experts, academics and private players to provide joint technical and thematic advisories for implementation of such practices in convergence with climate, urban planning and disaster resilience interlinkages
- ▶ **Building further evidence for knowledge and learning** – Parvat Manthan will continue to support partners through documenting of best practices, modules and data on priority thematic areas which will be disseminated through field visits, webinars, podcasts and compendiums planned throughout the year



Officials from the State Governments of the Indian Himalayan Region, Nepal and Bhutan in Leh, Ladakh

ABOUT NIUA

National Institute of Urban Affairs (NIUA) is India's leading think tank on urban planning and development. NIUA's Sanitation Capacity Building Platform (SCBP) aims to address urban sanitation challenges in India, through capacity development of stakeholders in urban sanitation. This can facilitate improved delivery of sanitation services through implementation of citywide inclusive sanitation approach and adoption of non-sewered sanitation, including Faecal Sludge and Septage Management (FSSM). Through its experience and learnings over the past five years, SCBP has developed a normative framework for states on mainstreaming non-sewered sanitation. To deliver proof of concept of this framework, SCBP is working in Uttarakhand and providing capacity building, technical, and policy & advisory support on Integrated Wastewater and Septage Management (IWSM) at the state and ULB levels.



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