Waste Management–Dehradun, India

Creating Inclusive Sanitation Systems

Introduction

Located in the foothills of Himalayas, Dehradun is the capital of the state of Uttarakhand. One of the most popular tourist destinations of the country, Dehradun is known for its scenic landscapes and natural beauty. Dehradun is one of the fast progressing cities of the state. Apart from toilets in individual houses, Dehradun also has 31 public/community toilets to cater the sanitation requirement. The six sewage zones in the city are Salawala, DoonVihar, Indra Nagar, Vijay Colony, Rispana, and Kargi.

However, only 34% of houses are linked with the sewerage network as of 2020. The rest 66% of the toilets are dependent on On-Site Sanitation (OSS) System. The Citywise Inclusive Sanitation (CWIS) method is being implemented to enhance the management of the sanitation network.

Citywise Inclusive Sanitation (CWIS)

Photograph 1: Generation and treatment of sewage in Uttarakhand

The four WIS principles are essential for effective and equitable sanitation management. Firstly, they ensure that all individuals benefit equally from safe services and public investments. Secondly, they mandate that human waste is safely managed throughout the entire sanitation network. Thirdly, they require authorities to operate with a clear and inclusive mandate, ensuring transparency and accountability. Finally, the principles advocate for the deployment of a variety of hardware, funding, and business models by authorities. These models support the adoption of simple, local, and financially sustainable technologies, which enhance the treatment of faecal sludge and septage. This comprehensive approach benefits all stakeholders, particularly citizens who rely on on-site sanitation systems.

About the project

Following a pre-feasibility study and offers of technical design suggestions, Uttarakhand Jal Sansthan (UKJS) chose to perform a pilot-scale co-treatment of faecal sludge and septage at the STP. The technical design recommendations for pilot-scale co-treatment approved by the UKJS were then processed for funding allocation from Uttarakhand state resources.

Under the Atal Mission for Rejuvenation and Urban Transformation 2.0 (AMRUT 2.0) fund for urban development directorate plans, Uttarakhand Jal Sansthan (UKJS), NIUA and Forum for Inclusive and Resilient Sanitation in Hill Cities have been working towards it.

Project Implementation

The Kargi Chowk STP manages 68 million litres per day (MLD) of designed capacity, considering this a 130 kilolitres per day (KLD) of the co-treatment facility is proposed to treat septage from the city and surrounding areas. Following the commencement of construction, the projected treatment facility is expected to have an implementation period of three months.

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Implementation

The implementation period for the installation of facility is 3 months once the construction work starts. The co-treatment facility ensures systematic method of receiving faecal sludge and septage at the inlet of STP in and around the city for fifteen years. Solid-liquid separation process for incoming FSS to be done using spare units in the STP. Liquid stream to be mixed with incoming sewage at the STP and solid stream to be dewatered using centrifuge and sludge drying.

Monitoring, Evaluation and Management

The 34% of linked sewerage network across the six zones will be monitored. Desludging frequency ascertained at five to eight years with vehicles capacity to be 4,000 to 6,000 litres. Desludging cost of INR 3000 for each house to be brought down with the proposed STPs and new FFS co-treatment plant. Wastewater to also be treated through seven STPs.

Inadequacies and Learnings

With bevy of advantages also comes some shortcomings. The CWIS creates high sludge and septage concentration in the aeration basin of STP creates and rise in odor in the STP premises. The pipes get blocked or hardened due to fat, oil, and grease deposition. This may lead to burst pipes, overflow, reduction in capacity.

Impact

Because of Dehradun's topography, providing sewer connection to each and every household proved to be technically challenging. It was assessed that every STP has some spare treatment capacity and thus before FSS treatment, a pre-treatment facility has been installed to ensure a simple and low-cost co-treatment infrastructure

The Kargi STP will cater to the septage treatment needs of Doiwala, Herbertpur and Selaqui Urban Local Bodies (ULBs) that are within a 25 km distance. The project will ensure city wise inclusive sanitation and support citizens relying on-site sanitation systems.

Conclusion

Creating Inclusive Sanitation Systems ensures that all residents, regardless of their socio-economic status, have access to safe and reliable sanitation services. Such initiatives minimize environmental pollution by properly treating and disposing of wastewater and sludge. Also, promotes the use of sustainable and resilient sanitation technologies and practices, ensuring long-term benefits for the city.

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