78% septage remains untreated in Uttarakhand and disposed off without any treatment endangering the natural environment as well as human health.

Urban Uttarakhand
Status and opportunities in septage management

Urban population*
30.5 lakhs
(30.2% of total population of state)

Urban local bodies*
90
Nagar Nigam (8)
Nagar Palika Parishad (41)
Nagar Panchayat (41)

Percent hilly area*
86%
9 out of 13 districts are hilly and pose a significant challenge to Septage Management

Faecal sludge generation*
722 KLD

Current treatment through STPs*
158 KLD
(22%)

Total STP capacity
288 MLD

Utilised STP capacity*
116 MLD
(60% unutilised)

Challenges
- Smaller towns are completely dependent on septic tanks
- Limited service provisions for desludging septic tanks
- Limited land availability for setting up septage treatment facility
- Laying of sewer lines in the towns at higher altitude with steep gradient
- Lack of financial resources within the ULBs

％ septage remains untreated in Uttarakhand and disposed off without any treatment endangering the natural environment as well as human health.


MLD - Million Litre Per day
KLD - Kilo Litre Per day

<table>
<thead>
<tr>
<th>Septage generation</th>
<th>No. of ULBs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 4 KLD</td>
<td>53</td>
</tr>
<tr>
<td>4 to 10 KLD</td>
<td>22</td>
</tr>
<tr>
<td>10 to 50 KLD</td>
<td>12</td>
</tr>
<tr>
<td>Above 50 KLD</td>
<td>3</td>
</tr>
</tbody>
</table>

Except Tehri Garhwal and Haridwar which have high piped sewer coverage, all other districts are largely served by septic tanks.

Percentage of urban households in Uttarakhand having onsite sanitation systems (septic tanks/pit latrines)
Sewage Treatment Plants (STPs), Uttarakhand, 2018

Septage generation in various towns of Uttarakhand

- 80% of Uttarakhand’s total sewage treatment plant capacity caters to Dehradun, Rishikesh and Haridwar
- 9 cities mentioned below could explore co-treatment of septage at sewage treatment plant
- 6 cities could treat their septage via septage treatment plant
- 55 towns with septage generation less than 4 KLD need alternative septage treatment solution

**Legend**
- NMCG Town
- Statutory City/Town
- Ganga River

**Note:** STPs highlighted in blue shows higher potential for co-treatment of septage due to under utilized STPs.

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**Generation of Faecal Sludge (KLD)**

- Dehradun: 170 KLD
- Rudrapur: 125 KLD
- Haridwar: 59 KLD
- Haridwar: 53 KLD
- Roorkee: 39 KLD
- Kashipur: 37 KLD
- Rishikesh: 22 KLD
- Kicha Cities: 16 KLD
- Pitroag: 14 KLD
- Doiwal: 12 KLD
- Jaspur: 11 KLD
- Nainital: 9 KLD
- Srinagar: 7 KLD
- Mussoorie: 6 KLD
- Tehri: 5 KLD

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**Potential to treat septage via co-treatment as towns have existing STP**

**Potential to treat septage at Septage Treatment Plant**
**Objectives of treatment**

To reduce the pathogens to a safe level and to recover resources from the septage.

- **Dewatering**
  - Dewatering reduces the weight and volume of septage making it easier, cheaper, and safer to manage.

- **Stabilization**
  - Septage contains organic material, which are beneficial for plants and hence needs to be stabilized.

- **Nutrient Management**
  - Septage contains nutrients like N,P,K which are essential for plant growth. Therefore septage should be transformed through treatment for further use.

- **Pathogen Reduction**
  - Key objective of septage treatment is pathogen reduction to protect public health. Level of pathogen reduction depends on final use/disposal.

**Treatment options for Septage in Uttarakhand**

The diagram depicts how septage can be treated in ways that are best suitable for the context of Uttarakhand.

- **Co-treatment at STP**
  - Towns with STPs should adopt co-treatment of septage with mechanized solid-liquid separation as preliminary treatment unit.

- **Treatment at SeTP**
  - Mechanised
    - • Land and topography constraint
    - • High water table
    - • Weather constraint
  - Non-Mechanised
    - • Land availability
    - • Flat region
    - • Low water table

**Septage Treatment Plant (SeTP)**

- **Sedimentation unit / mechanised solid-liquid separator**
- **Anaerobic baffled reactor**
- **Oxidation Pond/ UV treatment**
- **Clean effluent**
- **Re-use (Organic Manure)**

**Russi Village**
- 2 MLD (84%)

**Hari Nagar**
- 0.45 MLD (44%)

**Krisnapur**
- 0.8 MLD (41%)

**Bhimtal**
- 1.25 MLD (66%)

**Bukh**
- 2 MLD (84%)

**Haldwani**
- 28 MLD (0%)
Operationalising septage management in Uttarakhand

- Protocol for septage management notified in May 2017
- State septage management committee (NIUA supported) established in August 2019

State Level Advisory Body/ State Septage Management Committee

State Septage Management Committee
- Secretary, UDD: Chair
- Secretary, Peyjal Uttarakhand: Co-chair
- Director, UDD
- Managing Director, Peyjal Nigam
- Chief General Manager, Jal Sansthan
- NIUA representative

District Level Monitoring Committee

Septage Management Cell at ULB level
- Executive body at ULB level for implementation
- Ensures the septage/effluent from individual or common septic tank and bio-digester is collected and appropriately treated before its safe disposal
- Power to impose penalty to individual, government body or private entrepreneur to enforce the protocol
- Identification and registration of individual septic tanks, community septic tanks and bio-digesters

Protocol for Septage Management

- Provides regulatory framework for construction, routine maintenance of septic tanks and bio-digesters; transportation, treatment and safe disposal of septage
- Prescribes the actions to be taken by the owners of the premises connected to septic tanks/bio-digesters and septage transporters to ensure compliance with their obligations
- Provide for appropriate inspection and enforcement mechanisms
- Ensure cost recovery on a sustainable basis for proper septage management
- Facilitate participation of private and non-government sector in septage management

Septage Treatment Potential via Co-treatment at STPs and SeTPs in Uttarakhand

- Out of 722 KLD of septage generated only 158 KLD is currently treated
- Unused STP capacity can be used to treat faecal sludge/septage which will increase the treatment coverage by 25-30% taking the treatment coverage to 286 KLD in Uttarakhand
- Treatment of septage via SeTPs will further increase the treatment capacity in Uttarakhand by 260 KLD (36%)