



THIMPHU URBAN SANITATION

REVIEW AND RECOMMENDATION

2025

Stocktaking Achievements, Identifying
Challenges, and Recommending Solutions
Across the Sanitation Service Chain

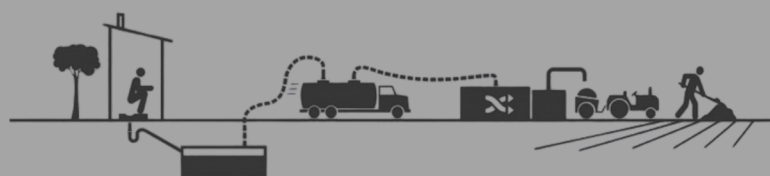


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ACKNOWLEDGEMENT

Thimphu urban sanitation review and recommendation 2025 was developed as the joint effort of key stakeholders from both Government and CSOs representatives. This is the first of a kind of review document that captures the progress and way forward throughout the entire sanitation service chain. This document will be helpful for planners, decision makers and sanitation workers in the process of making interventions in development of urban sanitation facilities and services.

The drafting committee comprising representatives from Thimphu Thromde, Ministry of Health, Bhutan Toilet Organization would like to thank all the stakeholders for providing us the field data in the process of reviewing status and emerging challenges.

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I. INTRODUCTION

Thimphu, the capital city of Bhutan, is home to over 107,420 people making it the largest urban center in the nation (PHCB,2017). Additional 20 % of floating population may be accounted as people from across Bhutan migrate to and visit Thimphu for various reasons, including health services, education, employment, and business opportunities. The city hosts critical national institutions such as the Jigme Dorji Wangchuck National Referral Hospital, key government ministries, corporate headquarters, and major public service agencies. Additionally, Thimphu is a year-round tourist destination, significantly contributing to Bhutan's economy through the tourism sector.

As Thimphu continues to urbanize rapidly, challenges related to sanitation and waste management have intensified. These challenges pose serious risks to public health and contribute to environmental degradation, particularly through the pollution of nearby water bodies. Commendable progress has been made as the expansion of the sewerage network cover more than 70% of households and about 29% of the population still relies on onsite sanitation systems (SFD report, 2024). Managing domestic wastewater, fecal sludge, and septage has emerged as a key issue that demands urgent and coordinated action. A comprehensive review of the entire sanitation service chain is essential to identify gaps, inform planning, and guide future interventions.

As the capital, Thimphu serves as a benchmark for other cities in Bhutan. Improving sanitation services here can set an example of best practices for replication elsewhere. This includes ensuring equitable access to public sanitation facilities, especially for vulnerable groups, to uphold human dignity and fulfil the fundamental right to safe and adequate sanitation.

This document presents a review of the current state of urban sanitation services in Thimphu, identifies key challenges, and offers recommendations for achieving safely managed sanitation citywide.

I.1 OBJECTIVES/SCOPE

- Assess the current status of sanitation infrastructure and services in Thimphu
- Identify key challenges along the entire sanitation service chain
- Recommend sustainable and inclusive solutions for efficient service delivery and improvement

2. APPROACH

To conduct this review, we adopted the Citywide Inclusive Sanitation (CWIS) framework, which offers a comprehensive planning and implementation approach to ensure that sanitation services are safe, equitable, and sustainable. The CWIS framework was also introduced to local sanitation stakeholders and service providers through capacity-building sessions aimed at strengthening institutional knowledge and service delivery.

Another key methodology used in this review was the development of a Shit Flow Diagram (SFD) for Thimphu Thromde. The SFD provides a visual representation of how fecal sludge and wastewater flow through the city's sanitation system—highlighting the proportion that is safely managed versus unsafely managed. This analysis was instrumental in pinpointing gaps and prioritizing areas for intervention.

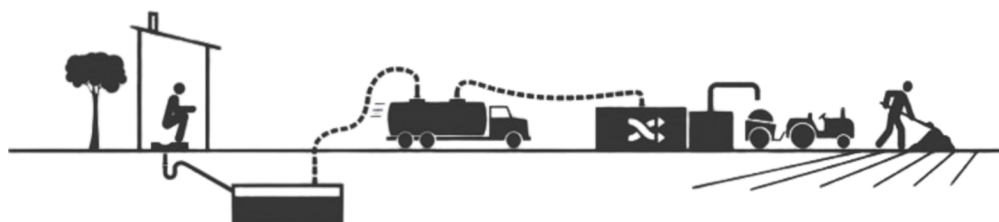
The development of this report also involved extensive stakeholder consultations, including with municipal officials, service providers, and community representatives. These dialogues enriched the review and ensured that the recommendations are context-specific, inclusive, and practical.

3. SANITATION SERVICE CHAIN

For sanitation workers across all levels—whether involved in planning, service provision, regulation, monitoring, or decision-making—it is essential to assess service standards comprehensively across the entire sanitation service chain. This chain starts at the user interface (toilet) and extends through containment, emptying and transport, treatment of fecal sludge and septage, to final safe disposal or reuse.

In this review, we have assessed the service outcomes related to **safety**, **equity**, and **sustainability** at each stage of the sanitation chain. Based on this assessment, targeted recommendations for improvement and intervention have been proposed.

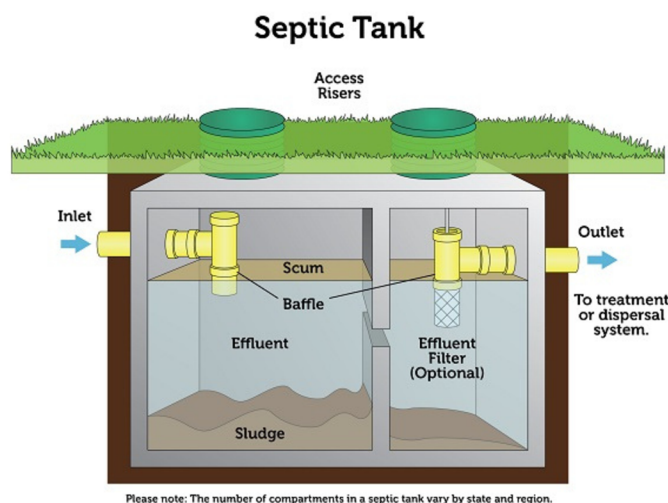
In addition, the **functional dimensions** of sanitation governance—such as roles and responsibilities, monitoring and accountability mechanisms, and resource mobilization—have been reviewed separately in alignment with the Citywide Inclusive Sanitation (CWIS) framework.



3.1 CONTAINMENT

3.1.1 Status

As per the National Health Report, 2023, the percentage of safely managed sanitation for urban stand at 81.6 % and 85.1% for rural areas. As per the Shit Flow Diagram (SFD) report, 2024 for Thimphu Thromde, 29 % population rely on onsite sanitation and 70% has access to sewer network connections. The onsite sanitation users are those who could not access the sewer network due to topographical issues. The containment system practiced by onsite sanitation users varies from permeable line pits to septic tanks. The regulation on Bhutan Building Regulation, 2018 mentions about need of proper design of septic tank and soak pit under Plumbing and sanitation drawings section however detail standards and drawing of septic tank with illustration is advocated through the Septic Tank Manual, 2013 published by Ministry of Infrastructure and Transport erstwhile Ministry of Work and Human Settlement.



3.1.2 Issues

- Lack of proper septic tank with soak pit as per Septic Tank Manual, 2013 in most of the public and private buildings was observed leading to frequent overflow of septage and unsafe leakage into the nature.
- Frequent overflow of septic tanks due to poor design and incidences of illegal disposal of septage into drainage and nearby streams posed risk to both public health and environment.
- The issue with hinderance of right of way by some property owners prohibits other building owners to access public drainage and sewer network.
- There is topographical issue faced by more than 20% households in Thimphu to access sewer network.
- Lack of adequate monitoring and assessment of proper standard of septic tanks with soak pit during the construction process.

3.1.3 Recommendations

Recommendations	Intervention provisions/types	Priority	Responsibility /Partners
Advocate and create wider awareness to educate on proper septic standards of septic tank design with soak pit as per Septic Tank Manual, 2013.	Enhancing Capacity and Behavioural Change Program	High	Thromde
Advocate for behavioural change to prevent dumping of common waste such as condom, sanitary pad, baby diapers, wipes, bottles to prevent treatment plant breakdown	Enhancing Capacity and Behavioural Change Program	Medium	Thromde
Establish proper monitoring and assessment system to identify faulty septic tanks and prevent illegal dumping of septage into the drainage and streams	Strengthening Monitoring and Regulatory System	High	Thromde
Advocate clearer regulation and benefits to respect easement rights to enable the property owners to access public sewer network and drainage	Strengthening Monitoring and Regulatory System	Medium	Thromde
Revise existing construction regulation to provide access to pour-flush toilets with proper containment in constructions sites and temporary settlement in Thromde area to prevent Open Defecation.	Strengthening Monitoring and Regulatory System	High	Thromde/MoIT
Regulate dumping of waste from meat shop and construction waste into the sewer chamber.	Strengthening Monitoring and Regulatory System	High	Thromde
Institute a separate waste collection system for diapers and sanitary pad to enable safe management of child faeces and other waste.	Infrastructure Development Needs	High	Thromde
Advocate installation floor trap in kitchen and bathroom to prevent solid waste into the sewer network and avoid blockage.	Infrastructure Development Needs	Medium	Thromde
Upgrade public toilets standard with inclusive and accessible features.	Infrastructure Development Needs	High	Thromde/CSOs

3.2 EMPTYING & TRANSPORT

3.2.1 Status

Thromde has three operational cesspool trucks in operation which can be availed through G2C online system. Each truck has a driver and one helper to provide emptying service. Annually building owners can avail three times of free emptying service if they have subscribed to water meter system provided by Thromde. As per the service record of 2024, the average of 80 trips per truck in a month was provided. For the additional service after annual free quota Nu 1000 per trip is being charged. There is one private service provider complementing the emptying service provided by Thromde. They cater to 10-20 household monthly which comes average of 50 trips per month. The private company charges Nu 2000 - 2500 per trip for their service within Thimphu Thromde and adds mileage for areas outside of the city.

The comparative service provided are as mentioned in the table below:

Service Provider	Fee per trip	Trucks	Driver	Helper	Average Trips (Monthly)
Thromde	1000	3	3	4	80
Private	2000 - 2500	1	1	1	50



3.2.2 Issues

- Some septic tanks are not accessible to cesspool trucks for emptying due to the lack of proper road connections.
- Thromde experienced an overwhelming demand for emptying services when it was provided as a free public service. However, the majority of property owners are not availing the paid service after exhausting the three rounds of free emptying.
- Due to the absence of a Faecal Sludge and Septage Treatment Plant (FSSTP), there have been instances of indiscriminate disposal of septage into manholes, which adversely affects the proper functioning of the Sewer Treatment Plant (STP).
- Currently, greywater from kitchens and bathrooms—which requires treatment before being released into the environment—is not connected to the sewer network due to capacity constraints.
- There have also been incidents of roof water from private properties and stormwater from drains being connected to the sewer network, increasing the load on the system, especially during the monsoon season.
- Additionally, incidents of manhole cover theft have resulted in open manholes, which not only cause sewer blockages but also pose serious risks to pedestrian safety.

3.2.3 Recommendations

Recommendations	Intervention provisions/types	Priority	Responsibility /Partners
Thromde should educate property owners on safe management of septage and monitor the incidences of septic tank overflow as per water and sanitation rule and impose the penalties.	Capacity and Behavioural Change Program	High	Thromde
Build the capacity of service providers on proper emptying of septic tanks, safe handling of septage and provide them with adequate safety gears.	Capacity and Behavioural Change Program	Medium	Thromde
Thromde should regulate the accessible septic tanks by cesspool truck and service providers must ensure tools such as booster pumps to access the septic tanks.	Strengthening Monitoring and Regulatory System	Medium	Thromde
Streamline proper monitoring of tankers service through GPS system and simplify service request system for fast and efficient service delivery.	Strengthening Monitoring and Regulatory System	Medium	Thromde
Thromde may explore outsourcing emptying service to private individual or private operators/service providers considering the cost-benefit analysis and efficiency.	Strengthening Monitoring and Regulatory System	High	Thromde/Pvt. Company
Considering 29% of onsite sanitation users, it was found necessary to establish one Faecal Sludge Treatment Plant (FSTP) for the proper septage management.	Infrastructure Development Needs	High	Thromde/CSOs
It was recommended to augment the existing six sewer treatment plants (STP) to increase the capacity absorb the grey water treatment.	Infrastructure Development Needs	High	Thromde
Augmentation of current sewer line capacity to transport both black water and grey water treatment may be explored by Thromde.	Infrastructure Development Needs	Medium	Thromde

3.3 TREATMENT

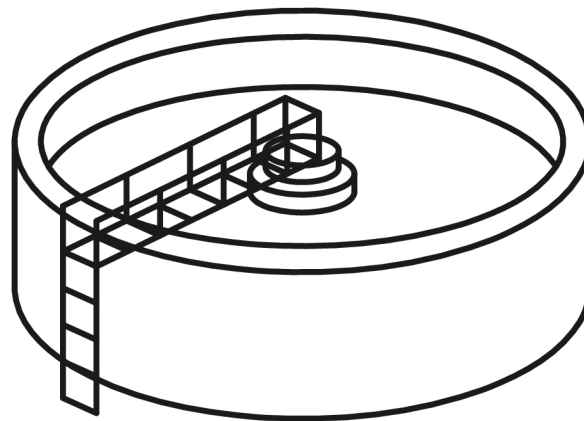
3.3.1 Status

There are 3 technicians looking after the six community STPs in Thimphu Thromde. One STP for Dechencholing community is non-functional due to damage caused by flood. The Waste Water Treatment Plant at Babesa and Jungshina are currently operated by private company as per the project contract. The average monthly energy consumptions are 90000-100000 kWh. In total Thimphu Thromde has 7 treatment plant as mentioned in the following table:

Sl#	Name of STP	System	Capacity (MLD)	Year of Commission	No of buildings Connected	Remarks
1	Dechencholing STP	Moving Bed Bio Film Reactor	0.75	2013	155	Non-Functional
2	Taba STP	Eco-line	1	2019	370	Functional
3	Babesa STP	Sequential Batch Reactor	12	2021	3600	Functional
4	Hejo STP	Mokan Joka System	0.1	2019	74	Functional
5	Langjophakha STP	Activated Sludge Process	0.6	2017	105	Functional
6	Lungtenzampa STP	Activated Sludge Process	2	2018	244	Functional
7	Jungshina STP	Sequential Batch Reactor	1	2023	261	Functional

3.3.2 Issues

- The treatment plant at Dechencholing catering to almost 8000 household was damaged by flood rendering non-operational.
- The capacity of treatment plants for Taba and Jungshina STP are inadequate amidst increasing households and need for treatment of grey water.
- Lack of Faecal Sludge Treatment Plant (FSTP) results in dumping of sludge and septage into STP causing damage for proper function of STP.
- Thromde experience the damage of STP due to dumping of solid waste and septage in the manhole.
- Lack of properly trained technical expertise for operation and maintenance of treatment plants of different designs and models.
- Difficulties in sustained maintenance and operation due to multiple treatment technologies adoption
- Lack of proper operation and maintenance protocol for treatment plants.
- Lack of dedicated garbage disposal truck for treatment plants.
- Non-availability of spare parts in the market for treatment plant has affected the timely maintenance of plants.



3.3.3 Recommendations

Recommendations	Intervention provisions/types	Priority	Responsibility /Partners
Initiate capacity building of technicians and develop clear operational and maintenance protocol for each treatment plants	Capacity and Behavioural Change Program	High	Thromde
Wider public education to dumping of solid waste and septage into the manhole need to be carried to reduce such cases and prevent the damage of the treatment plants	Capacity and Behavioural Change Program	Medium	Thromde/CSOs
Develop Standard Operation Protocol for safety, proper operation and maintenance of each treatment plants.	Strengthening Monitoring and Regulatory System	Medium	Thromde
Based on the field experience, it is recommended to focus on adopting common model of treatment technology for sustainable operation and maintenance. The field experience suggests that SBR system is comparatively Operation & Management friendly.	Strengthening Monitoring and Regulatory System	High	Thromde/MoIT/ Urban Centers
Prioritize fund mobilization for new 2.5 MLD WWTP for Dechencholing area to cater to 8700 households.	Infrastructure Development Needs	High	Thromde
It is recommended to augment Taba and Jungshina STP and increase the capacity by approximately 2.5 MLD	Infrastructure Development Needs	High	Thromde
Prioritize mobilizing budget for establishment of one faecal sludge treatment plant (FSTP) for onsite sanitation users.	Infrastructure Development Needs	High	Thromde/CSOs
Thromde should assign a dedicated garbage disposal truck for the treatment plants	Infrastructure Development Needs	Medium	Thromde

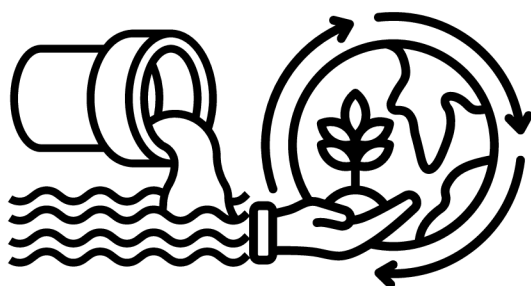
3.4 REUSE & DISPOSAL

3.4.1 Status

Treated Wastewater from treatments plants are safely released into the Wangchuu. Currently there is no record of treated wastewater being reused. The monthly and weekly regular testing of effluent quality is carried out by Thromde lab technicians. Faecal sludge from the treatment plants is disinfected and contained in a pit and finally disposed to the landfill. Due to lack of FSTP proper treatment of faecal sludge has remained a challenge. Desludging for small capacity treatment plants are carried out twice a month. Solid waste screened from the incoming chamber is disposed to the landfill. The reuse of the wastewater and faecal sludge hasn't been formalized despite the potential for reuse.

3.4.2 Issues

- The dewatered sludge output in Babesa WWTP is slurry and difficult to handle.
- Lack of dewatering machine in five community STPs hinders drying of sludge in a manageable form as 80 % of sludge is liquid.
- Lack of proper sludge drying bed prolongs drying period for the sludge and emits foul smells in the neighbourhood.
- Lack of dedicated cesspool truck for sludge emptying and transportation trucks has affected the timely desludging of STPs.
- Lack of scientific evidences and government regulation for reuse of sludge as manure has hindered potential reuse.
- There is no third-party agency or regulator to crosscheck and carry out independent monitoring of the effluent quality test done by Thromde lab.



3.4.3 Recommendations

Recommendations	Intervention provisions/types	Priority	Responsibility /Partners
Facilitate research studies in collaboration with relevant agencies on reuse of treated faecal sludge as manure.	Capacity and Behavioural Change Program	Medium	Thromde/RUB/C SOs
Identify the independent agency to monitor the safety standards of sludge output and effluent quality before releasing back to nature.	Strengthening Monitoring and Regulatory System	Medium	Thromde/NEC/D ECC
The five treatments plants require individual dewatering machines for safe handling and management of faecal sludge.	Infrastructure Development Needs	High	Thromde
Improve sludge drying facilities in all treatment plant to speed the drying process and control the odour affecting neighbourhood.	Infrastructure Development Needs	High	Thromde

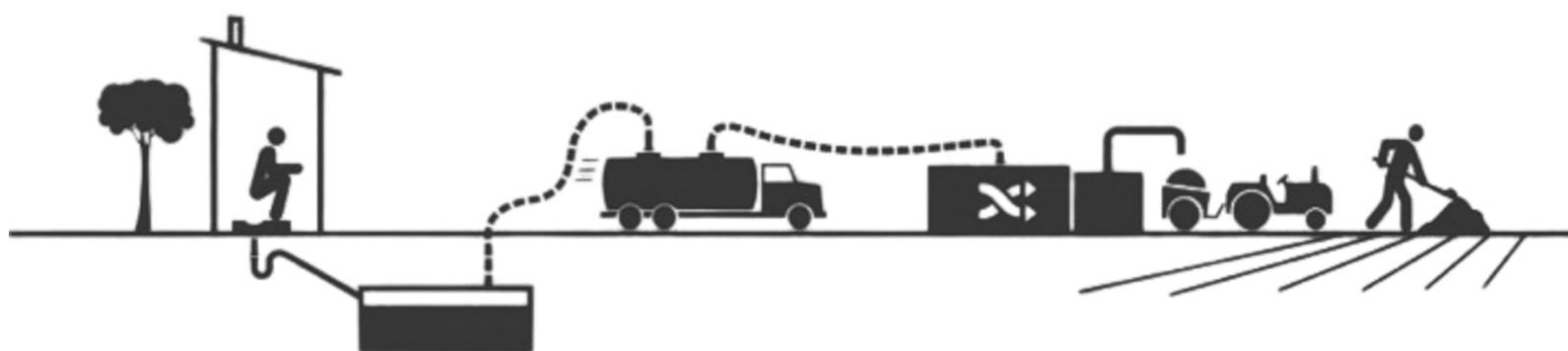
3.5 SANITATION SERVICE PROVIDERS

3.5.1 Status

Sewer Section under the Thromde's Operation and Maintenance Division looks after the facilities and services along the sanitation service chain however there are some gaps in clarity on responsibility of managing public toilets. The private sanitation service providers include Dr Toilet, Ugyen Phuntsho Sewerage, Pro-touch and Housinng.bt.

3.5.2 Issues

- There is no clarity of responsible section to look after the management Thromde public toilets.
- There are some gaps in coordination among service provider along sanitation service chain and inspectors responsible for monitoring.
- Lack of specific structured course on sanitation hinders capacity building and strengthening technical skills of sanitation workers and planners.
- Lack of adequate and appropriate PPE for safety of sanitation workers pose associated health risks.
- Inadequate housing for sanitation workers specially for those who look after the treatment plants affect the service delivery.



3.5.3 Recommendations

Recommendations	Intervention provisions/types	Priority	Responsibility /Partners
It is necessary to develop a structured course on sanitation and hygiene in collaboration with technical institute to provide in-country professional training for technicians, planners and decision makers.	Capacity and Behavioural Change Program	High	Thromde/Technical institutes/CSOs
Develop proper SoP for private sanitation service provider and regulate the service standards frequently by Thromde.	Strengthening Monitoring and Regulatory System	Medium	Thromde/Private companies/CSOs
It is recommended that the service providers throughout the sanitation service chain responsible for toilet, septic tanks, sewer network and treatment plants management to be under one reporting head for proper coordination and service delivery.	Strengthening Monitoring and Regulatory System	High	Thromde
It is recommended to include the public toilets under sewer section for proper monitoring and maintenances.	Strengthening Monitoring and Regulatory System	Medium	Thromde
It is recommended to provide high quality and appropriate PPE and promote responsible use for safety of the sanitation workers.	Strengthening Monitoring and Regulatory System	High	Thromde
Sanitation workers must be facilitated to receive regular health screening and necessary vaccination for safety.	Strengthening Monitoring and Regulatory System	High	Thromde
Provide adequate housing for the workers within the vicinity of the treatment plants.	Infrastructure Development Needs	High	Thromde

3.6 FINANCING AND SUSTAINABILITY

3.6.1 Status

Construction of new sewer infrastructure such as treatment plants, network and public toilet are met from the capital budget approved by central government. The new infrastructure development requires alignment with five-year plan. The operation and maintenance cost of sewer facilities inside Thromde are covered from the recurrent budget collected as user fees and charges from residents.

3.6.2 Issues

- Sanitation section receives less priority among competing development activities for capital budget from central government.
- Limited or no training budget and opportunities for sanitation workers to update and build the capacity.

3.6.3 Recommendations

Recommendations	Intervention provisions/types	Priority	Responsibility /Partners
Strengthen sanitation section and coordination for budget proposal on activities along sanitation service chain	Capacity and Behavioural Change Program	High	Thromde
Enhance partnership with Civil Society Organisation for resource mobilization through projects and external donors.	Strengthening Monitoring and Regulatory System	High	Thromde/CSOs

4. CONCLUSION

Thimphu, as Bhutan's rapidly growing capital city, stands at a critical juncture in its urban sanitation journey. While notable progress has been made—such as the expansion of the sewerage network and increasing awareness around sanitation—gaps persist in ensuring that all components of the sanitation service chain are safely, equitably, and sustainably managed.

This review has highlighted the importance of addressing challenges across the full spectrum of sanitation services: from the user interface and containment, to safe emptying, transportation, treatment, and final disposal or reuse. Particular attention must be paid to populations reliant on onsite sanitation systems, which are often underserved and present considerable health and environmental risks if not properly managed.

Equally important are the governance and functional aspects of sanitation—clarity of institutional roles, effective monitoring mechanisms, adequate resource allocation, and active community engagement. The application of the Citywide Inclusive Sanitation (CWIS) framework has provided a structured approach to evaluate both service outcomes and institutional performance.

Going forward, there is a strong need for integrated planning, improved coordination among stakeholders, and continued investment in capacity building and infrastructure. Thimphu's role as a model urban center offers an opportunity to lead by example and demonstrate best practices in delivering inclusive and resilient sanitation services.

By implementing the recommendations outlined in this review, Thimphu can move closer to achieving the national and global targets for safely managed sanitation, while protecting public health, promoting environmental sustainability, and ensuring dignity for all.

5 REFERENCES

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