Inclusive Climate Sensitive WASH Framework for Small Town

Concept Note

Working Document

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Overview of the Framework

The ICS WASH framework is a decision making tool designed to empower ULBs and small towns with fewer than 100,000 populations to plan and implement WASH systems that are climate resilient.

1.1 Rationale

Most small towns (defined as having less than 100,000 residents) have been at the receiving end of poor investments across of WASH, namely water, sanitation and waste management systems, resulting in low service qualitzy levels. Further, access to WASH services is inequitable. It depends on location within the city, home ownership and land tenure, and the socio-economic situation of residents. Climate change is further magnifying these inequities and inefficiencies.

While larger cities contribute significantly to emissions that are causing climate change, small towns disproportionately bear the consequences—and their residents and municipalities have weaker capabilities and fewer resources, to manage such crisis or bounce back during and after vulnerabilities.

Infrastructure development methods and technology choices are developed for larger cities, and often not appropriate for small towns. Several national initiatives, such as the **Net-Zero Climate Resilient City Action Plan, the CapaCITIES Project, AMRUT, Smart Cities Mission etc.,** focus on enhancing climate resilience and low-carbon strategies for cities, but their implementation in smaller towns is either non-existent or limited.

WASH services are the most basic yet important service in small towns and command a large share of municipal budgets and capital expenditure. Small town municipalities are struggling to understand the various linkages between climate change and urban planning and infrastructure, and do not know how to develop their systems to be "climate-smart" or "climate-resilient."

Hence, while holistic Climate Action Plans are being developed for larger cities, smaller towns need decision-making tools to support planning processes, in context of their challenges and resources. Given the importance of WASH services and the large investments WASH infrastructure requires, we believe there is a need for a framework that specifically helps small towns to plan and implement WASH systems in a climate-sensitive manner, so that basic services become inclusive and accessible to everyone in the town.

1.2 Intent and Goals of the Inclusive and Climate-Sensitive WASH Framework for Small Towns (ICS-WASH)

This strategic framework advances the thinking around WASH systems and climate change, to equip small town ULBs with the knowledge, tools, capacities and strategies needed to not only anticipate climate-induced challenges they may face, but to also plan WASH infrastructure and service delivery to all residents in the face of such challenges.

WASH Services providers is the system that directly interact with users, ensuring access to safe water, sanitation, and waste management.

WASH Infrastructure includes the physical equipment and facilities that allow WASH Services to be provided, and tend to be capital intensive and long-term investments by the Government and private players.

The Framework will be useful to:

a) **Municipal or Urban Development Officers** in charge of preparing city development plans, reviewing DPRs and tender documents, and allocating budgets related to WASH infrastructure and services;
b) **WASH Practitioners and Consultants** involved in designing and implementing WASH projects;
c) **Active Citizens** of small (and large) towns who want to better understand the decisions their town is taking, or who want to support their town in planning for the future.

Implementing this Framework with help Municipalities do the following:

1. **Gather relevant data** to understand the state of WASH Services and identify gaps
2. Understand how various groups may be **vulnerable to disruptions in WASH services** in the future due to climate events
3. **Identify options** for Climate-Resilient WASH Interventions
4. **Co- Create short-and-long-term Climate Action plans for Resilient WASH services**
5. Create a system for **periodic review** of WASH services, to update plans so as to work in a systematic way towards long-term objectives.

1.3 Approach

The ICS WASH framework provides a structured, forward-looking approach that enables decision makers to prioritize, plan and implement robust WASH systems that withstand and adapt to climate pressures / challenges.

The process involves primary and secondary research, and extensive participatory discussions to generate local perspectives, which help identify vulnerabilities as well as existing resilience capacities.

Building resilient systems is not a one-time exercise but requires continuous engagement and is an iterative process.

The ICS-WASH Framework embodies this approach with a dynamic and flexible methodology that evolves alongside small towns as they experiment, adapt and grow responsive to changing climate impacts, to build thriving cities that improve quality of life for all residents.

1.4 Key features of the ICS-WASH

Bottom-Up approach: Stakeholder consultation and involvement is central to the process, including local political leaders, administrators, women, business owners, youth, marginalized groups, and experts. This shifts away from treating residents as passive recipients of decisions and policies, instead making them active participants in making their future resilient.

Focus and deep dive into WASH services: As discussed, WASH is a central need of people, and a major municipal responsibility in small towns. This Framework thus sharpens focus on it.

Prioritize Adaptation & Resilience of WASH systems and ULBs: This Framework enables Municipalities to better understand the impacts of climate change and how to adapt by retrofitting existing WASH infrastructure, and design future systems to withstand extreme weather events.

Simplified & Targeted Solutions for Small Towns: Focus on context-specific and pragmatic interventions that small ULBs can afford and implement, especially if there is a long-term plan to work on.

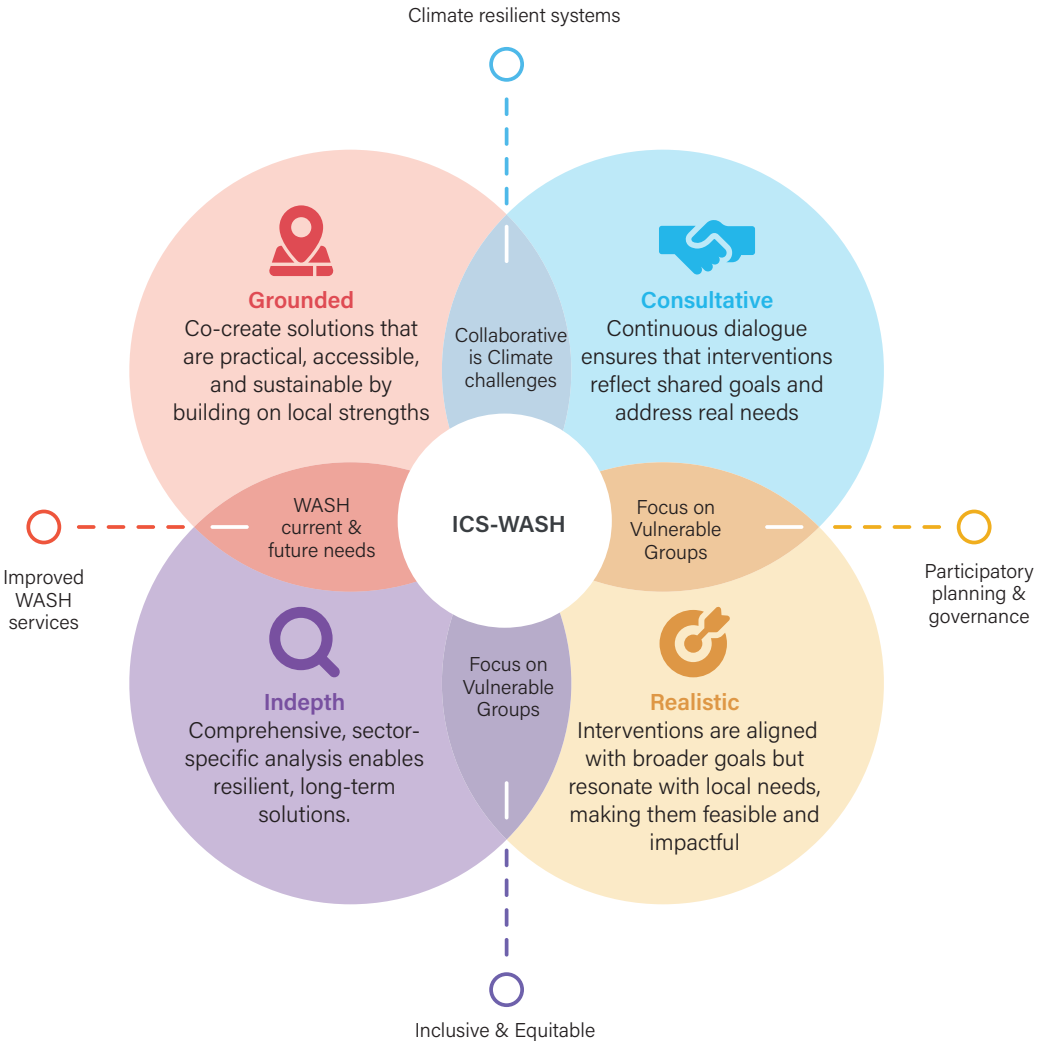
The ICS - WASH is built on a set of foundational principles that not only shapes its key features but also act as guiding principles throughout the development of the Climate Action Plan. These principles are consistently applied and reinforced at every stage from planning to the implementation of the action plan. Recognizing that these principles are participatory and often overlap, the framework is deliberately reflexive and iterative.

1. **Grounded:** Placing a diverse group of stakeholders at the center of decision making, and encouraging their active participation so as leverage local knowledge and address specific community needs and create broad buy-in and ownership

2. **In-depth:** By going deep into every facet of WASH infrastructure and service delivery in context of the technical, financial and governance capacities of the town, this Framework provides a very granular road map for a climate resilient future in the short and long-term.

3. **Consultative:** The planning, execution and monitoring process should be iterative, inclusive and regular, rather than a one-time exercise, and include multiple stakeholders (as mentioned above). Feedback loops are integral to this process, enabling reflection, learning, course correction and adaptation throughout the planning and implementation phases ensuring interventions remain dynamic and responsive to evolving challenges.

4. **Realistic:** This principle ensures that the bottoms-up approach of Consultative and Grounded processes are balance with financial realities and alignment with national policies and missions, thus increasing the chances of successful implementation and maintenance.



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Understanding the ICS-WASH

The ICS WASH Framework is anchored by four components that collectively provide a holistic understanding of WASH planning through a Climate- focused lens:

WASH Service-Level Assessment

Evaluate parameters such as access, equity, efficiency and sustainability of Water Supply, Storm Water Management, Sanitation and Solid Waste Management, using defined indicators to determine service gaps across the WASH value chain.

Climate Hazard and Risk Assessment

Evaluates exposure, vulnerability and hazard risks associated with climate change impacts on WASH systems.

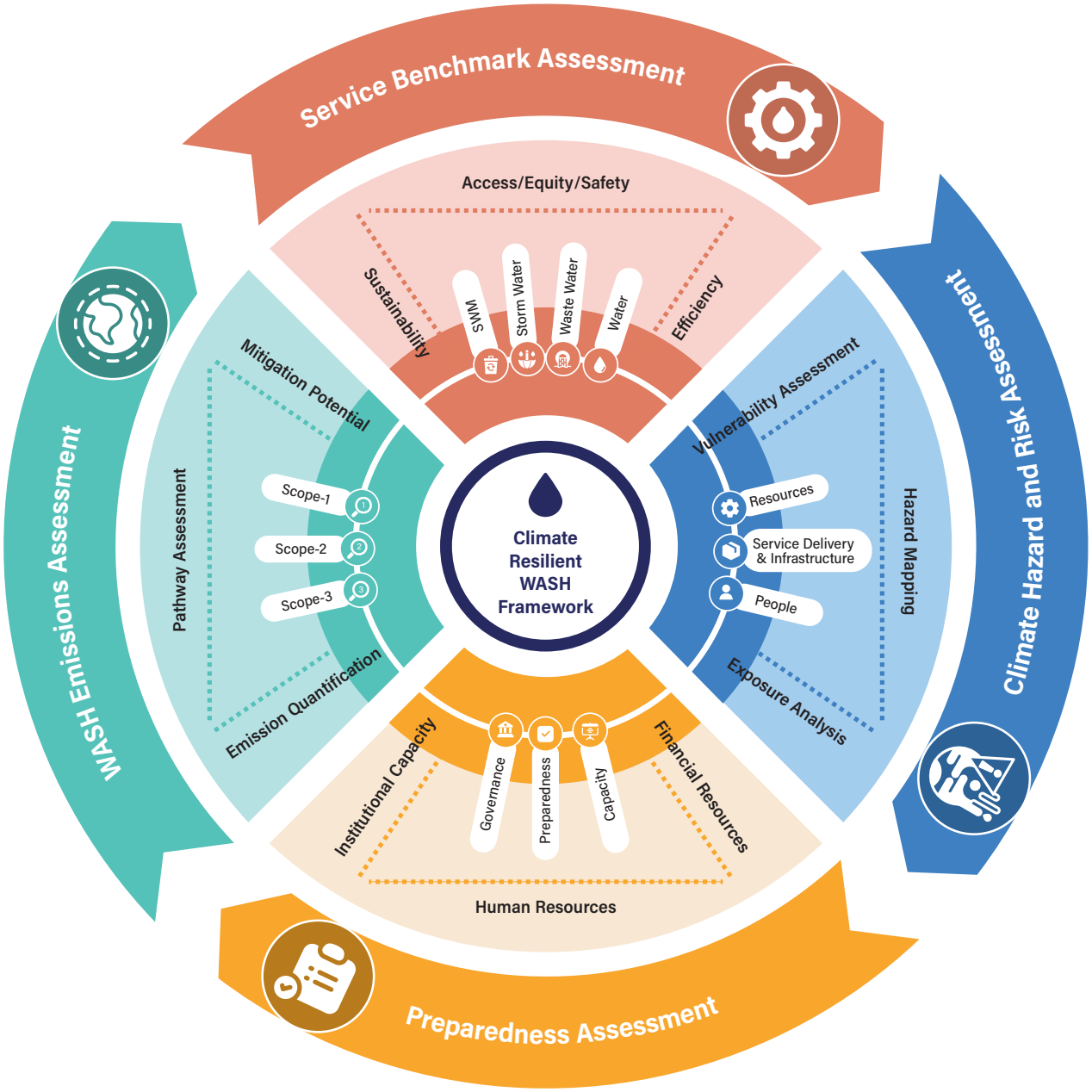
Adaptive Capacity

Evaluate institutional and governance capacitates and readiness of the ULBs to adapt to Climate risks.

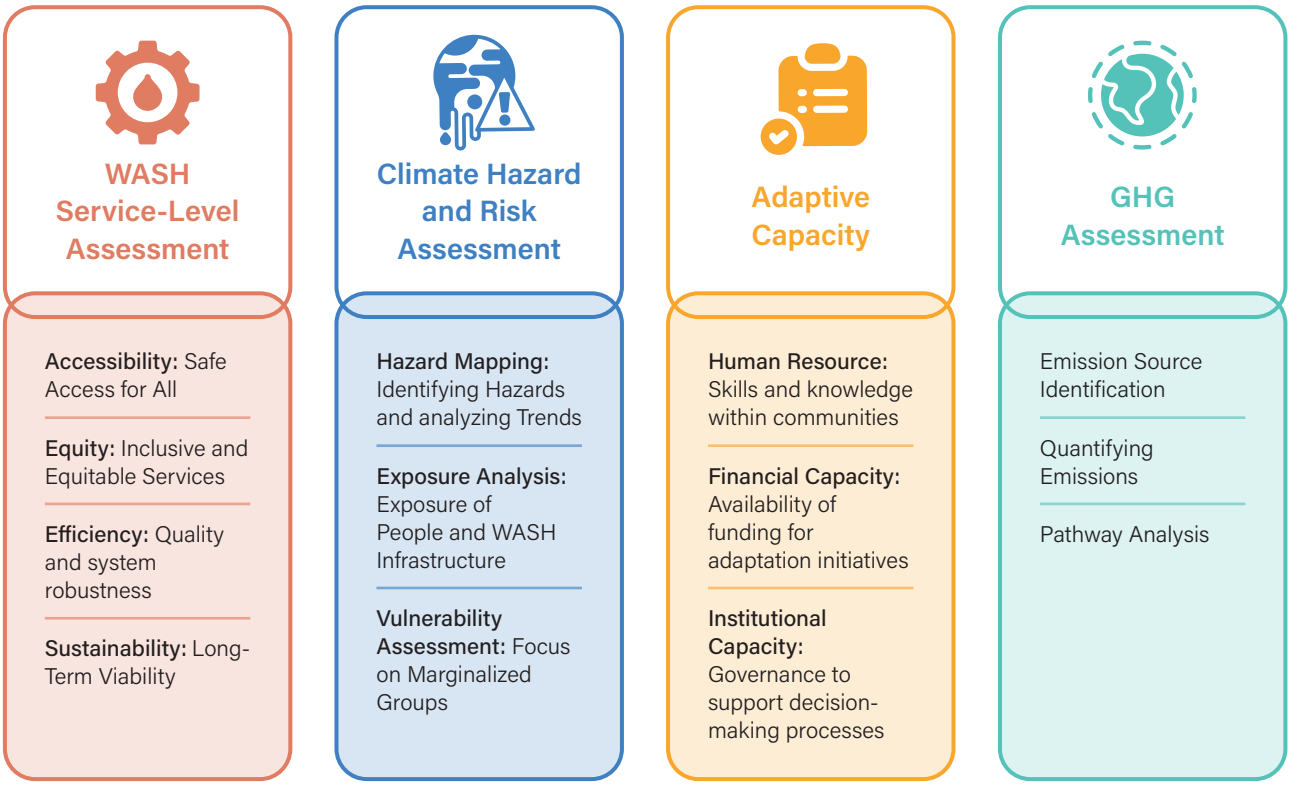
GHG Assessment

Quantifies the carbon footprint of WASH process in the town.

The interplay of these four domains helps establish a comprehensive baseline and prioritize interventions to formulate strategic forward-looking plans.



A brief overview of each domain is provided below:



2.1 WASH Service Level Assessment

The ICS WASH Framework for Small towns is built on a robust set of 32 indicators, categorized into four principles. Together, these indicators offer a comprehensive evaluation of a town's /ULB capacity to deliver Climate Resilient WASH services.

Each core principle is supported by a subset of indicators for each sector that guides the evaluation process to ensure a deeper exploration into WASH Service delivery.

1. **Accessibility:** Ease with which all individuals can reach and utilize water and sanitation facilities without compromising on quality and safety, even during climate disasters. Aligning with the essence of inclusive frameworks across the globe, taking everyone along the journey of climate resilience forms a core element of our framework as well. This is reflected in the
2. **Equity:** Accessibility for everyone, particularly marginalized and vulnerable communities, and ensuring they receive equal access regardless of physical ability or socio-economic status.
3. **Efficiency:** Often overlooked, this highlights the need to optimize resources for maximum output, making the best use of the limited capacities of small towns.
4. **Sustainability:** Long-term viability of WASH services, rather than a piecemeal approach which often leads to failure in the near future.

WASH Service-Level Assessment	WATER	SANITATION	SOLIDWASTE	STORM WATER
Accessibility: Safe Access for All	1. Coverage of HH with safe piped water supply 2. Access to Community taps	1. Access of safe sanitation facilities 2. Coverage of HH with sewerage connections 3. % of HH with access to deluding facilities	1. Access to SWM collection services Frequency of collection	1. Coverage of Stormwater network
Equity: Inclusive and Equitable Services	1. % of people with access to HH tap connections or community taps in LIC 2. frequency & duration of service of water in marginalised community	1. % of LIC population with access to safe individual toilets 2. % of PT with gender safe/inclusive elements 3. % of LIC population with access to safe management/ disposal of WW	1. % of LIC population with access to SWM collection 2. % of open dumping spots near LIC	1. Coverage of stormwater drains in LIC
Efficiency: Quality and system robustness	1. Quantity and sufficiency of water supplied 2. Sufficiency of available water treatment capacity 3. Non-Revenue Water	1. Functionality of CTs/PTs 2. Operational Capacity of wastewater treatment units 3. Regulatory Compliance in treatment quality	1. Efficiency in waste collection 2. % of waste processed 3. % of legacy waste remediated	1. Mixing of stormwater & water bodies with wastewater 2. Instance of water logging
Sustainability: Long-Term Viability	1. Water resource management and conservation measures	1. Reuse of treated wastewater & fecal sludge	1. Waste reduction measures 2. Percentage of waste material and energy recovery	1. Surface runoff management 2. Green Infrastructure

The indicators are aligned with other tools such as (CWIS Indicators, NIUA Climate Smart Cities Assessment Framework, C40 framework etc.) and tailored to the small-town context.

2.2 Climate Hazard and Risk Assessment

Effective Climate Risk Assessment requires a nuanced understanding of 3 concepts such as Hazards, Exposure and Vulnerability.

Hazards are the various climate-induced problems a location may face—floods, drought, heatwaves etc.

The level of ***Exposure*** to climate risks and hazards varies based on geographical location, proximity to sources of risks, and the quality of existing infrastructure.

Vulnerability is influenced by income and wealth (esp. quality of housing), demographics, and existing health conditions.

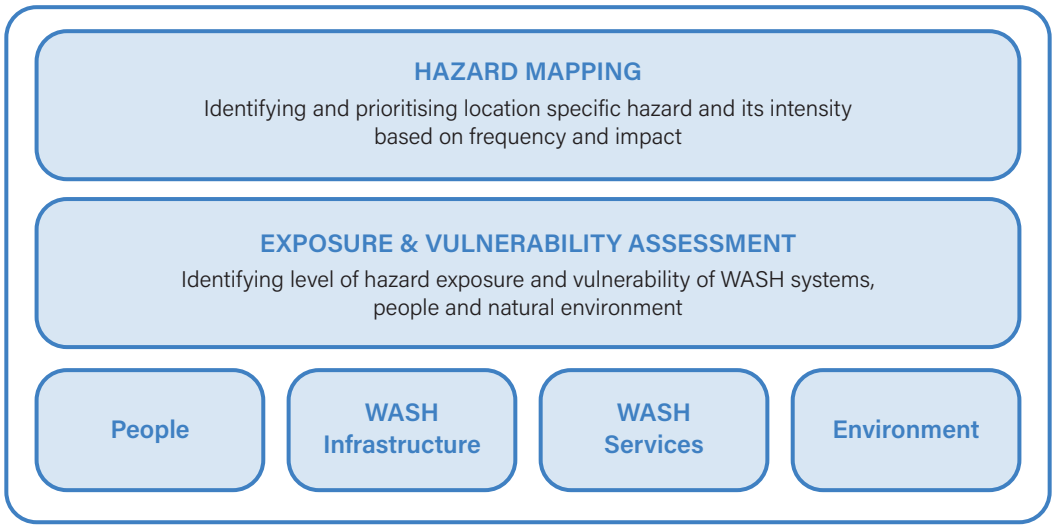
Thus, a group may be *more exposed but less vulnerable* if they have the financial resources to protect themselves from harm, while another group may be *less exposed but more vulnerable* if they are further away from a source, but do not have decent housing or other resources, or if their health is already poor. Thus, certain groups are particularly susceptible to climate impacts due to limited adaptive capacity.

This framework highlights the need to identify

a. Impact of changing climate on water ecosystems, including sponge zones (the **"Natural Environment"**),
b. Potential damage to **WASH Infrastructure** and
c. Disruptions in **WASH Services,** while
d. Understanding the effects of disrupted services on various groups of **People** of the town.

The assessment involves three key components: hazard mapping, exposure analysis, and vulnerability assessment.

CLIMATE HAZARD AND RISK ASSESSMENT-WASH



This comprehensive assessment identifies local climate hazards and evaluates their intensity. Exposure analysis provides insights into how these hazards impact WASH systems, water resources and the communities reliant on them. Further, vulnerability assessment pinpoints the most vulnerable elements, particularly the disadvantaged communities lacking effective adaptive measures.

Location specific climate hazards are identified and assessed based their scale, frequency, area of impact and the corresponding impact it has on WASH as outlined in the table below. This helps ULBs prioritize where to focus resources.

Table 1: Inspired and adapted by UNICEF WASH climate resilient development note

	Frequency	Area	Intensity
High	Existing problem and expected to increase in future	Affects a large area	Having a major impact on WASH to the level that it disrupts the service/infrastructure and takes more than few days to cope up/revive
Medium	Occurs occasionally and expected to continue to occur either occasionally or more frequently	Affects large area	Having a considerable impact on WASH to the level that it disrupts some specific areas/ communities and can be resumed in few days
Low	Rarely occurs and not expected to occur more frequently	Affects a small area	Having a minimal impact on WASH to the level that it causes inconveniences or temporary disruptions that can be fixed within a day

The table below shows four types of hazards that can affect small towns, which can affect People, WASH Infrastructure, WASH services, and the Natural Environment, and putting emphasis on the vulnerabilities across human, environmental and infrastructural domains.

Effects of Exposure to various Hazards:

Hazards		People	Natural Environment	WASH Infrastructure	WASH Services
Meteorological	Thermal Stress	H	M	N / L	L
	Rainfall / Snowfall Change	H	L / M	L	M
	Cyclones /. Storms	H	M	M / H	H
	Sea Level Change	L	L	M	N / L
Hydrological	Flood	H	H	M / H	H
	Drought	H	H	N / L	M / H
Geological	Land Deformation / Movement				
Environmental	Water Quality Degradation	M	N / L	N / L	L
	Fire	M	H	N	N

Impact: H High M Medium L Low N No effect

WASH System Vulnerability Assessment:
Spatial mapping helps visualize what parts of WASH systems—both Infrastructure and Services-are exposed to various hazards, and to what extent.

SECTOR	INFRASTRUCTURE	SERVICES
Water	▪ Water treatment plant ▪ Supply Network ▪ Pumping stations ▪ Intake wells ▪ Storage reservoirs (OHT/GLSR)	▪ Supply frequency ▪ Quality of water ▪ Pipe Leakages
Sanitation	▪ Public toilet ▪ Community toilet ▪ WASH centers	▪ Operationally ▪ Water availability ▪ Cleanliness, Hygiene and comfort
Wastewater/FSM	▪ Wastewater treatment plant ▪ Sludge treatment plant ▪ Sewerage network ▪ Onsite systems ▪ Pumping stations ▪ Wet well	▪ Availability of desludging services ▪ Operationally of sewer network/Onsite systems
Solid Waste Management	▪ Waste processing sites ▪ Transfer stations ▪ Community collection bins	▪ Availability of door-to-door collection ▪ Frequency of collection
Storm Water	▪ Storm water network ▪ Recharge structure	▪ Operationally of sewer network/Onsite systems

People:
Disadvantaged and marginalized communities face both high exposure and high vulnerability to climate hazards, because they tend to live and work in the most exposed areas (near waste dumping sites, near water basins and drainage areas), and have the least financial or political resources to protect themselves from hazards. Climate change thus exacerbates existing inequalities, impacting access to essential services and increasing health risks. This Framework explores Intersection of climate hazards and WASH access for vulnerable communities.

Mapping Vulnerability		
Sociodemographic	Women	Transgender communities
	Migrant labor	Social Class
	People with disabilities	Elderly and Children
Socioeconomic	WASH/Waste informal workers	Sanitation workers
Sociopolitical	Notified Slums	Non-notified slums, footpath dwellers
Residential/Lack of access	Lack of access to information	Access to WASH services

Natural Environment:
Different hazards have different short and long-term effects on the natural water ecosystem comprising of the elements mentioned below. The natural environment therefore needs to be properly monitored and protected, to ensure that it can continue to provide the ecosystem services that our towns and way of life depend upon.

It should be noted that there are many ways to manage the natural environment, and Nature-based-Solutions are increasingly gaining prominence over heavily concretized and engineered systems, for their lower lifecycle costs, greater adaptability and minimal disruption to natural processes and systems.

Natural environment					
Surface water- Lake, river, etc					
Ground water					
Wetlands					
Natural drains					
Green cover/Biodiversity					
Glaciers					
Another					

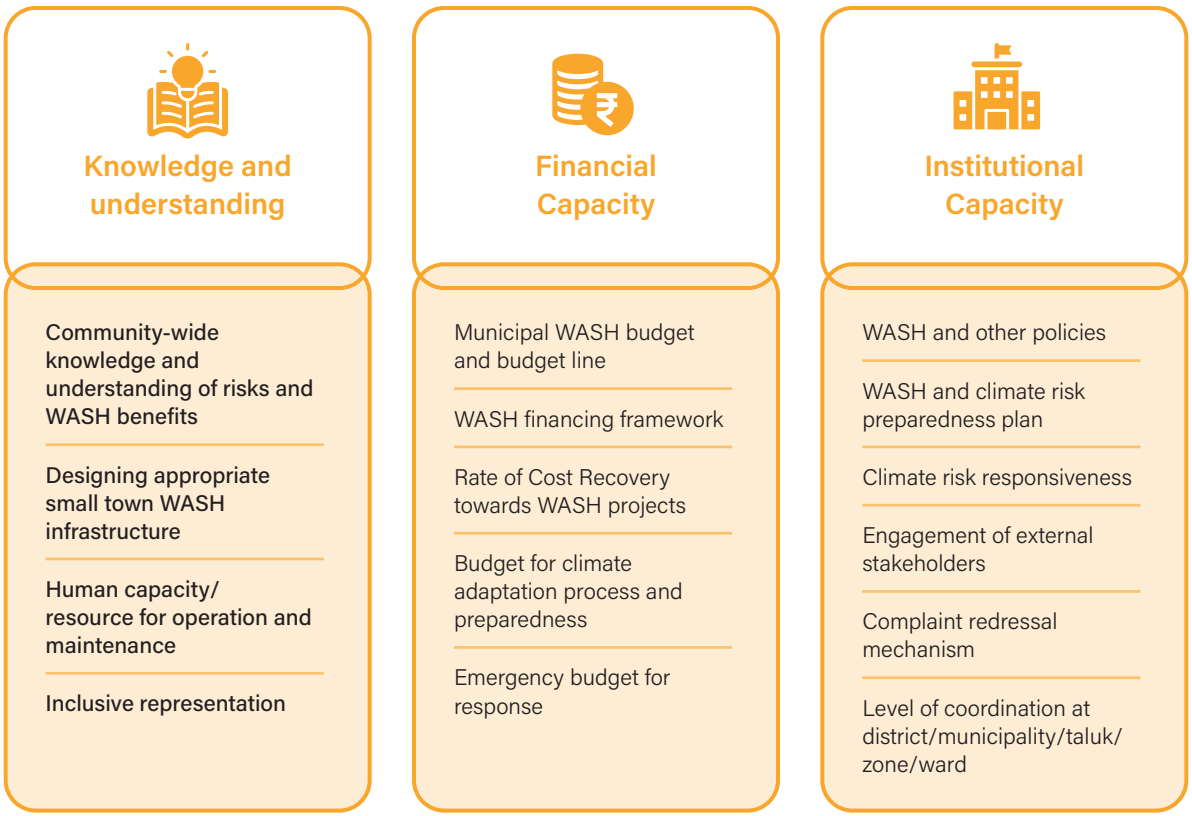
2.3 Preparedness Ready Review

Small towns often adopt solutions from larger cities, but those solutions usually do not fit their specific contexts due to higher costs and technological expertise needed to build and manage such systems. Thus, climate risk preparedness plans must account for the technical expertise available, and the financial resources available, so that the right decisions can be taken.

Institutional frameworks are crucial for coordinating efforts across sectors. Long-term planning and preparedness strategies depend upon building personnel skills, establishing effective governance structures, and fostering collaboration among stakeholders.

The Preparedness Ready Review Assessment evaluates the adaptive capacity of ULBs in the event of a climate hazard, across 3 critical dimensions: (i) Knowledge & Awareness, (ii) Financial Capacity, and (iii) Institutional Capacity.

Preparedness Ready Review/ Level for Preparedness



Knowledge & Awareness	This indicator assesses the depth of awareness and the technical readiness of ULBs and communities to identify, analyze and respond effectively to climate-induced challenges within the WASH sector.
Financial Capacity	This indicator evaluates the robustness of ULBs financial frameworks, including the adequacy and financial reserves, budgetary allocations and resource mobilization strategies for sustaining climate – resilient WASH initiatives.
Iinstitutional Capacity	This indicator measures the efficacy of governance mechanisms, institutional frameworks and policy instruments that enable ULBs to design, manage, execute WASH programs and climate resilience strategies with impact.

2.4 WASH GHG Assessment

Quantifying GHG emissions is important for climate mitigation efforts, but also to reduce local waste, pollution and costs. The carbon footprint of each sub-activity of water, wastewater and solid waste management is calculated against the general carbon accounting guidelines and reported in tCO2e. Embedded carbon in equipment and materials is not included at this time as small municipalities have limited options and flexibility, but this can be added in the future.

Scope 1	GHG emissions from sources located within the city boundary, including fuel (but not electricity), emissions from wastewater, wet waste and recycling processes.
Scope 2	GHG emissions of grid supplied electricity that is used in the city for WASH services
Scope 3	GHG emissions that occur outside the city boundary, but due to activities within the city boundary (eg. emissions from dumpsites located outside the city)

Emissions from the following Sources and Scope are included:

Sector and Sub sector	Scope 1	Scope 2	Scope 3
Water			
Water extraction from various source		Y	
City-level Water Treatment		Y	
Water distribution by piped network		Y	
Transporting water by trucks	Y		
Emissions from HH/commercial Water extraction		Y	
HH Water treatment	Y	Y	
Wastewater/FSM			
Septic Tanks and Containment Systems	Y		
Transportation of Fecal Sludge	Y		
Sewerage Network		Y	
Municipal FSTP / STPs	Y	Y	Y
Disposal of dried / treated Fecal Sludge	Y		
Reuse of treated wastewater	Y		
Decentralized STPs and ETPs (Buildings / Industrial)	Y		
Solid Waste Management			
Dumped but uncollected waste	Y		
Waste collection and Transportation	Y		Y
Wet waste processing and Treatment	Y		Y
Incineration of waste	Y		
Open Burning	Y		
Recycling Activities	Y		
Legacy waste dumping sites	Y		
Decentralized/community processing units	Y		

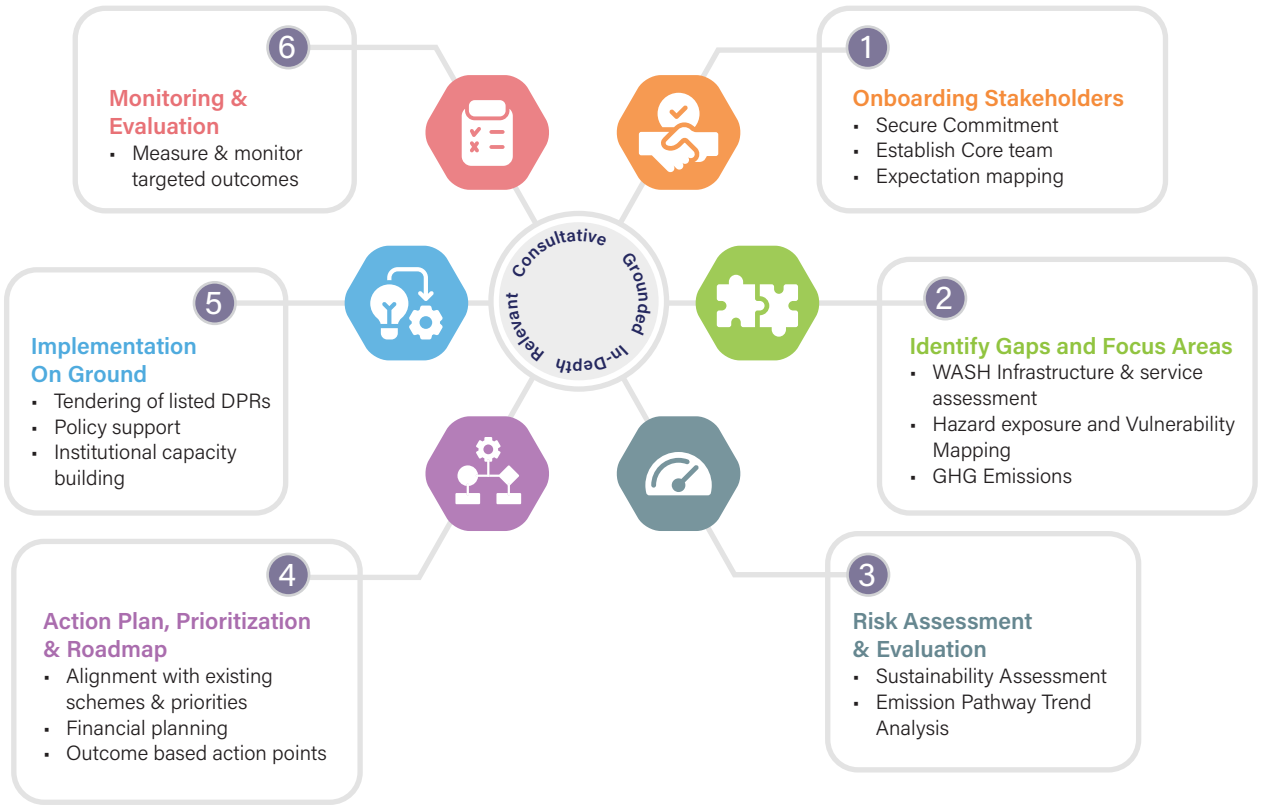
Each data point is processed using standard greenhouse gas reporting framework from IPCC to arrive at the final emissions figure.

3

Application of the Framework

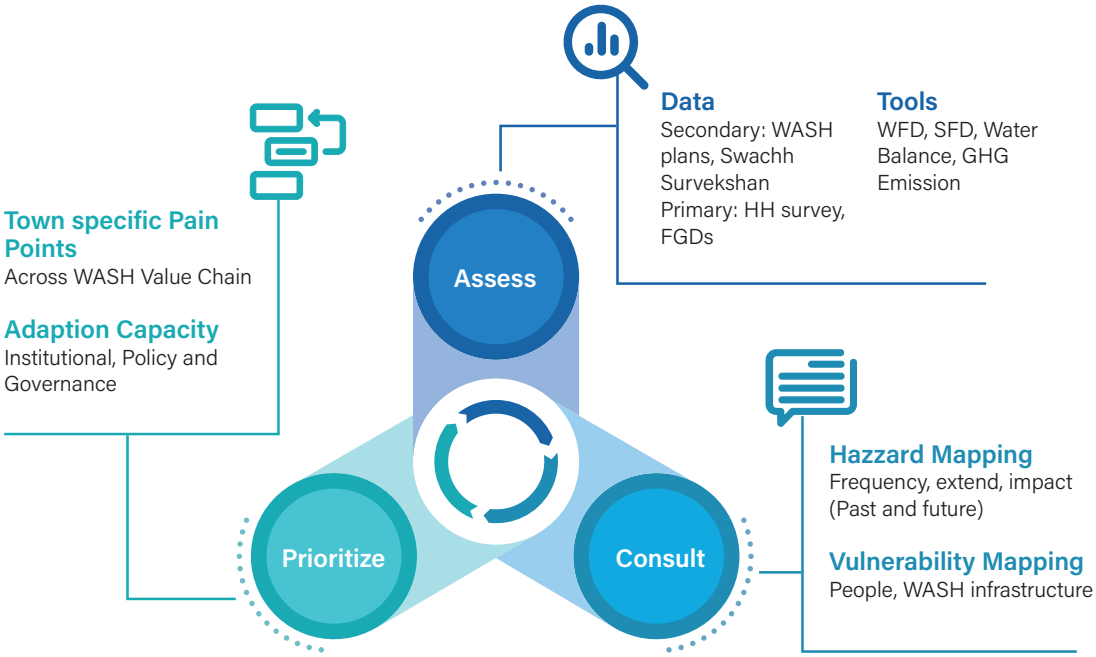
This approach is grounded in the principles of i) consultation with stakeholders throughout the process, ii) in-depth- understanding of the granular aspects of WASH, iii) relevance to existing schemes and priorities, and iv) grounded by ensuring practical context-specific action plans.

Implementing the ICS-WASH requires a structured six-step process designed to create actionable plans tailored to local contexts:



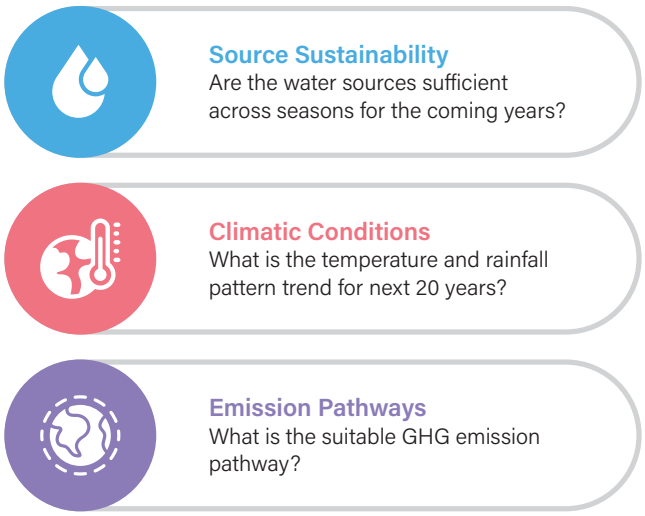
1 **On boarding of Stakeholders:** The process begins with stakeholder onboarding, where municipal officials and key actors in water, sanitation, and SWM sectors are engaged through extensive consultations to identify challenges, align expectations, and form a core team for collaboration.

2 **Conduct a Gap Analysis and Define Priority Focus Areas:** By utilizing tools like Waste Flow Diagrams and Water Balances to evaluate WASH services and the resilience of infrastructure. The goal is to identify gaps and highlight critical areas for improvement while aligning efforts with climate resilience objectives.



3 **Risk Analysis:** Subsequently, the risk assessment and mitigation step analyze GHG emissions, hazard exposure, vulnerabilities, and adaptive capacity to identify risks and mitigation opportunities of the town.

Trend Analysis and Projections



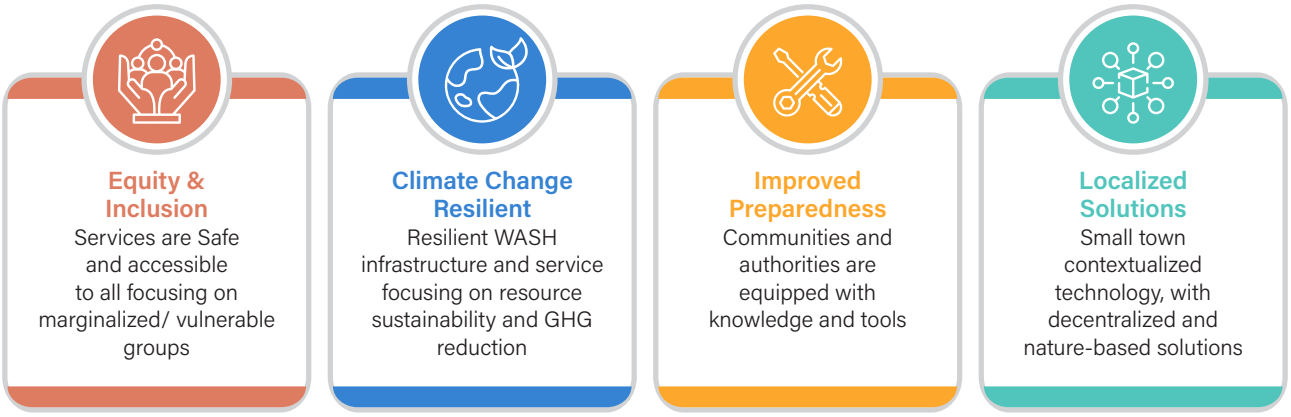
4 **Strategic Action Plan Prioritization and Development of an Implementation Roadmap:** Based on these insights, an action plan and roadmap are developed, categorizing initiatives into short, medium, and long-term actions aligned with local and national priorities.

5 **Ground Level Implementation and Execution:** The plan is then implemented on the ground with defined roles and responsibilities, supported by detailed project reports and policies

6 **Monitoring, Evaluation and Impact Assessment:** Finally, a monitoring and evaluation system ensures dynamic, annual reviews to adapt to evolving challenges and sustain progress, enabling small towns to systematically strengthen their governance and WASH systems for a resilient future.

3.1 Outcomes of the ICS WASH

By reviewing the town based on the assessment domains highlighted above, the framework achieves the following outcomes:



Note:

The ICS WASH framework is designed in an Iterative approach and is a work in progress. To remain relevant and context specific, we are discussing this with various players to incorporate their perspectives, and it is also being piloted in 2-3 partner towns of BORDA, where its application will provide critical insights and practical learnings.

Incorporating feedback based on ground realities will make the Framework more robust, actionable and tailored to the unique needs of small towns, ultimately serving a scalable model for Climate resilient WASH systems in small towns.

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