Bridging Sanitation Gaps in Chennai: Inclusive Solutions for Climate-Resilient Urban Poor Communities

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Chennai's sanitation: A focus on urban poor

Rapidly urbanising, towards periphery

2172 urban poor locations

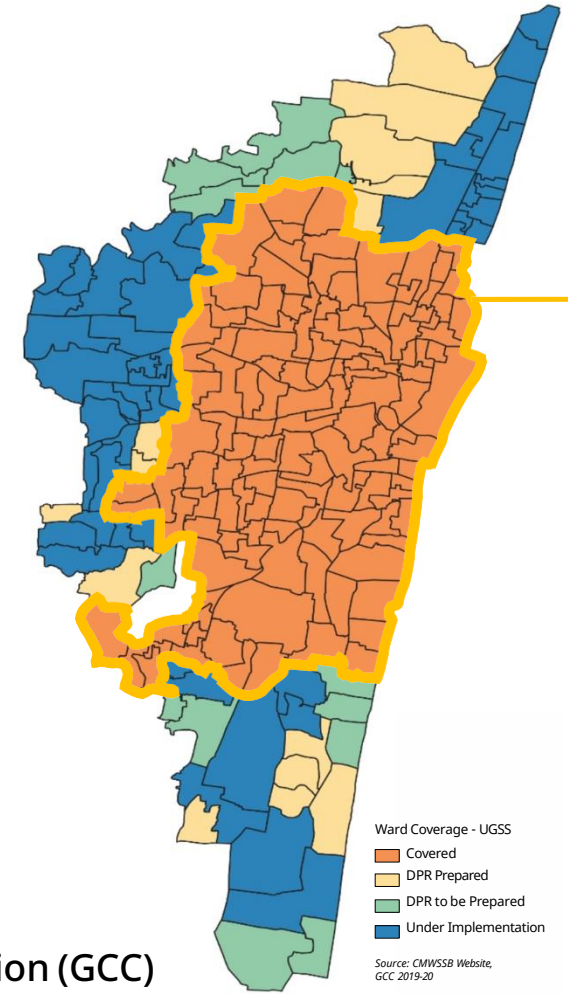
20% population

~200 tenements

Many slums along waterbodies (10%) and in industrial & commercial areas

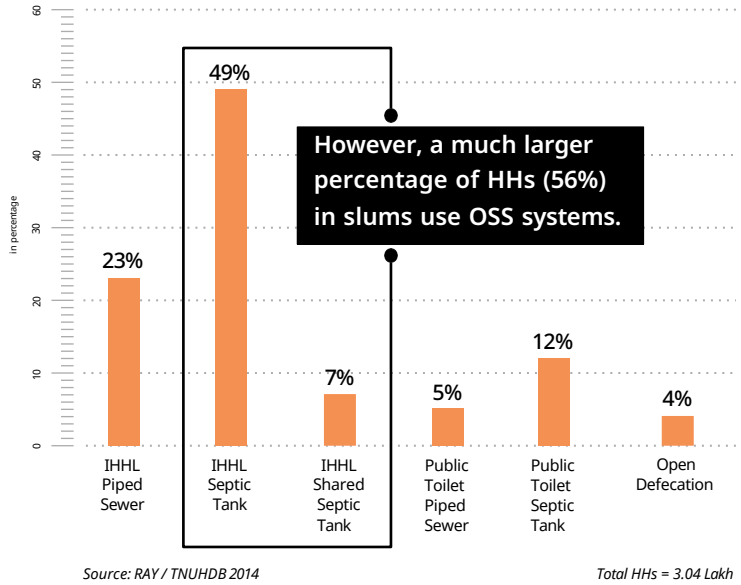
1374 Community/ Public Toilets (CT/PTs) maintained by Greater Chennai Corporation (GCC)
520 near urban poor areas

Source: TNUHDB 2023, GCC 2025



75% of urban poor settlements located here

Access to Sanitation Facilities in Slums



Source: RAY / TNUHDB 2014

Total HHs = 3.04 Lakh

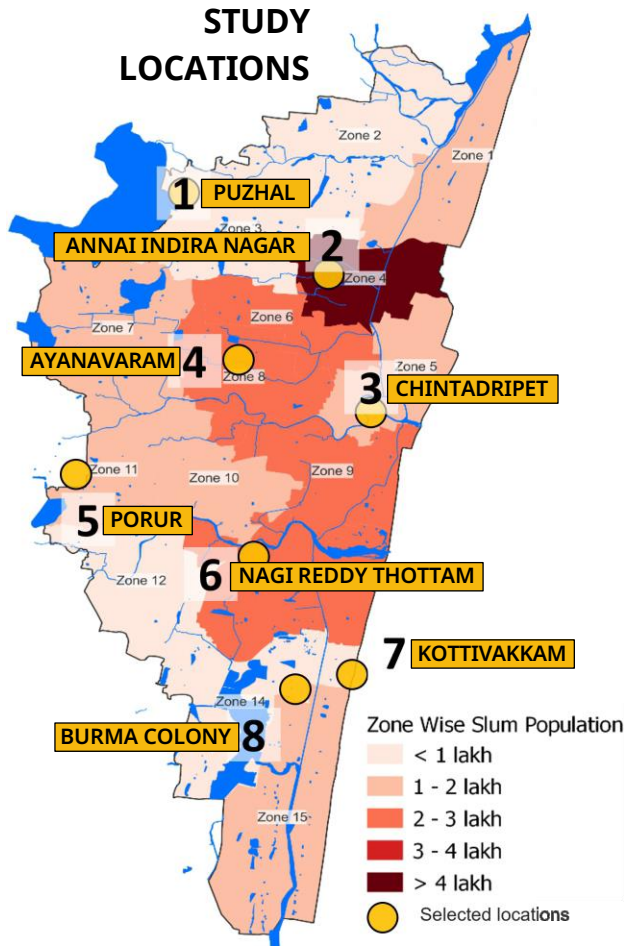
Indicates poor UGSS last-mile connectivity

Uncovering sanitation realities on-the-ground

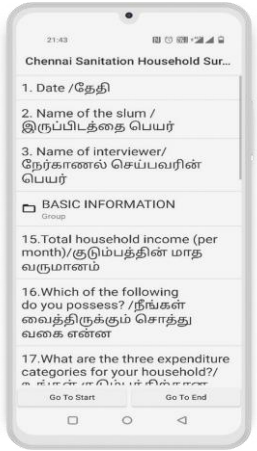
8 sites selected for the study, based on

- zone-wise density
- number of HHs
- land ownership
- geographic location
- proximity to water bodies
- presence of UGSS/ reliance on OSS

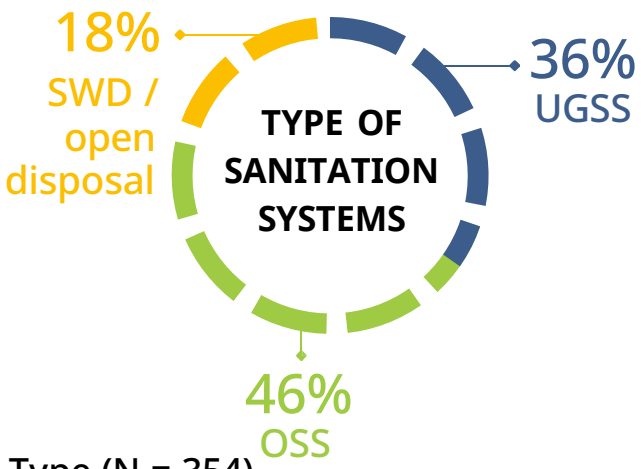
Mixed-methods approach: Visual reconnaissance, household survey (stratified random sampling), key informant interviews, focus group discussions and transect studies



Source: IIHS, 2023



Key Findings: Sanitation infrastructure & access



Type (N = 354)

Includes Aynavaram tenements.
Excluding Aynavaram (N=314),
UGSS = 28%, OSS = 51%

TOILETS STILL OUT OF REACH

- 20% HH lack IHHTs.
- 76% cite cost, 52% cite space constraints—space is a bigger barrier in high-density areas.

Source: Primary survey, IIHS, 2023

INFRASTRUCTURE GAPS

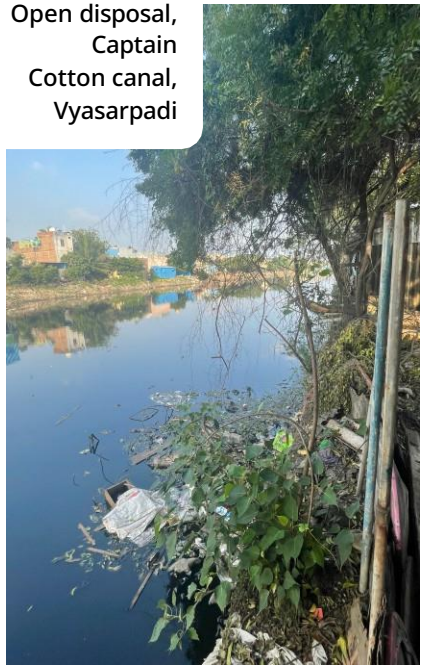
- Tenements built 40+ years ago lack CT/PTs, IHHTs inadequate for growing families.
- Too few cubicles at CT/PTs (eg: Chintadripet)
- 50% containment systems are non-standard & inaccessible

Narrow road, cul-de-sacs, Burma colony

Open disposal and solid waste disposal, Burma colony

SERVICE GAPS

- CT/PTs exist but remain locked (eg: Nagi Reddy, Chintadripet).
- 20% HHs not desludged in 5 years - hygiene & environmental risks.



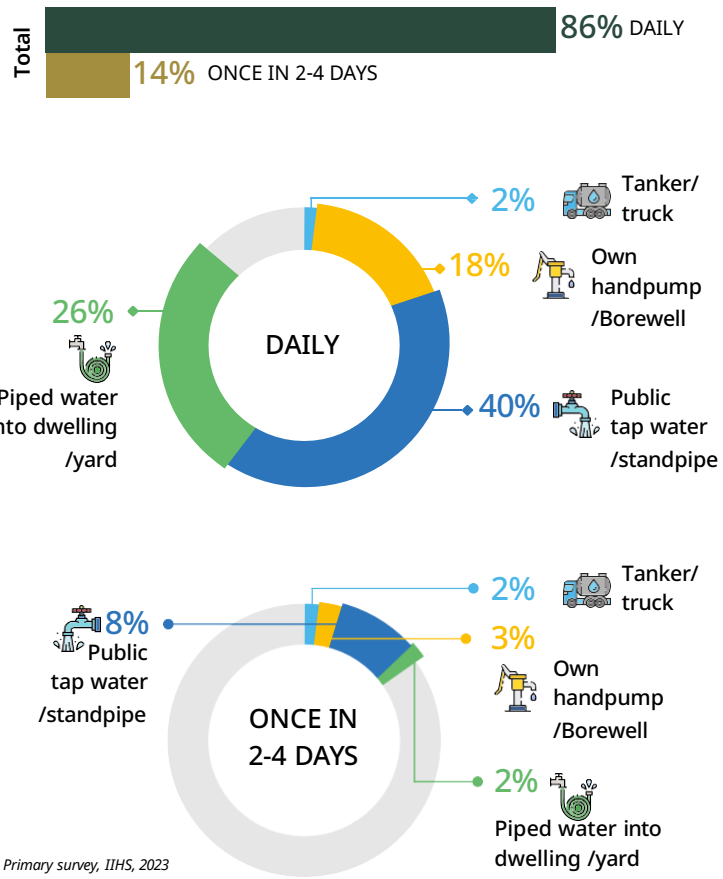
Open disposal, Captain Cotton canal, Vyasarpadi

WHY THIS MATTERS FOR CLIMATE RESILIENCE?

- Floods worsen sanitation failures
- Groundwater contamination & health risks
- Higher GHG emissions

Key Findings: Water

FREQUENCY OF SUPPLY OF DOMESTIC WATER FROM DIFFERENT SOURCES* SOURCE (N = 443)



Source: Primary survey, IIHS, 2023

SHARED & UNRELIABLE ACCESS

- **30% of HHs depend** on public taps - 11-12 families per tap.
- Many HHs **buy water for drinking,** adding to financial burdens.

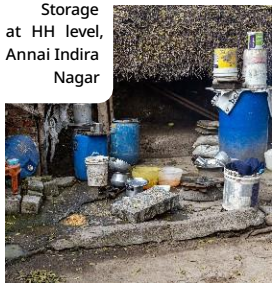
QUALITY CONCERNS

- 61% report malodorous water, raising safety and usability concerns.
- *50% of the households reported issues with the color of the water.*

AGING INFRASTRUCTURE

- *Old public stand posts and pipes support Annai Indira Nagar (also at Kottivakkam, Burma colony, Ayanavaram, Chintadripet)*

Non-functional public well, Guindy



Storage at HH level, Annai Indira Nagar

WHY THIS MATTERS FOR CLIMATE RESILIENCE?

- Increased reliance on alternative water sources
- Higher health risks
- Increased burden on existing infrastructure

Key Findings: Behavioral & operational challenges

OPEN DEFECATION PERSISTS

(Observed in 6 of 8 sites)

- **No toilets, no choice:** Lack of IHHT & public toilets forces OD.
- **Too many people, too few toilets:** Large families share a single IHHT (Nagi Reddy Thottam, Porur).
- **Cultural preference:** OD remains a choice in some areas (Kottivakkam).

OD Spot, Nagi reddy Thottam

Source: Primary survey, IIHS, 2023

IMPROPER WASTE DISPOSAL

- 18% HHs with toilets reported disposing waste directly into storm water drains (SWD)/ canals/ open areas

Kottivakkam

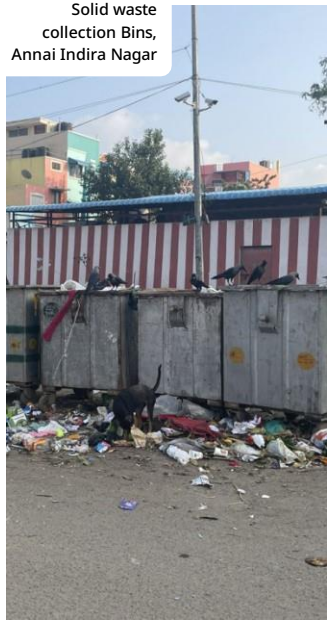
Porur

- SWD **clogged in 6 out of 8 locations** due to waste buildup.
- Despite **70% reporting D2D waste collection, open dumping continues.**

Open SWD at Chintadripet

Open SWD at Porur

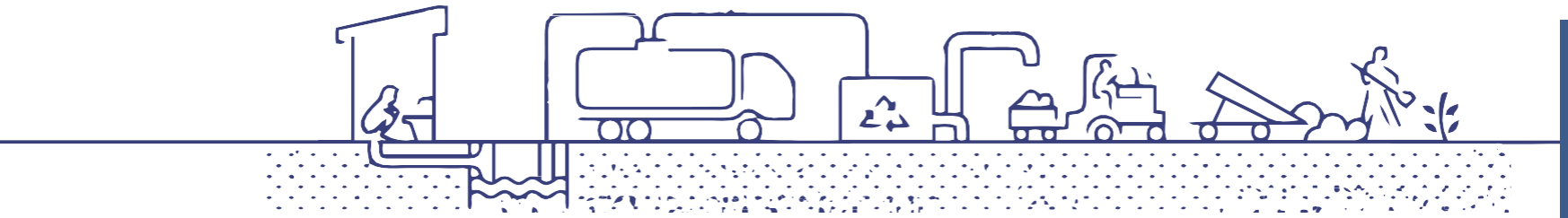
Solid waste collection Bins, Annai Indira Nagar



WHY THIS MATTERS FOR CLIMATE RESILIENCE?

- Clogged drains worsen urban flooding
- Water contamination & disease risks
- GHG emissions increase

Governance Shortfalls: A system in silos



	ACCESS	CONTAINMENT	COLLECTION & CONVEYANCE	TREATMENT	REUSE / DISPOSAL
Greater Chennai Corporation (GCC)	Implementing SBM Construction & O&M of CT/PTs	De-sludging CT/PTs	Monitoring of open disposal (in SWD)		Re-use treated water
Chennai Metro Water Supply and Swerage Board (CMWSSB)	Providing sewer connections	De-sludging CT/PTs	Providing last mile connection, subsidised for Economically Weaker Section (EWS) Regulation, monitoring of service providers	Construction, O&M of Treatment Plants (TPs) and UGSS	O&M of TPs
Tamil Nadu Urban Habitat Development Board (TNUHDB)	Construction of IHHTs in tenements		Construction, O&M of decentralised network and TPs at tenements (with CMWSSB)		

GAPS

Fragmented Responsibility

- Weak coordination, **no clear working modalities.**
- GCC & CMWSSB collaborate **only post-construction.**

Reactive, Not Resilient

- Focus on **mitigation over adaptation, limited community involvement.**

Weak Accountability

- **Poor monitoring** leads to delays in **grievance redressal.**

Climate Impact

- **No localised resilience strategies,** leaving vulnerable communities exposed.

Sanitation on the Brink: Chennai's Climate Challenge

Rising Risks: Floods, storms, heatwaves, water scarcity, sea-level rise. 13% of city's GHG emissions come from waste.

Water Insecurity: 53% of households rely on external water sources.

Extreme Heat & Housing Risks: 27% of slum houses have asbestos roofs, worsening heat stress.

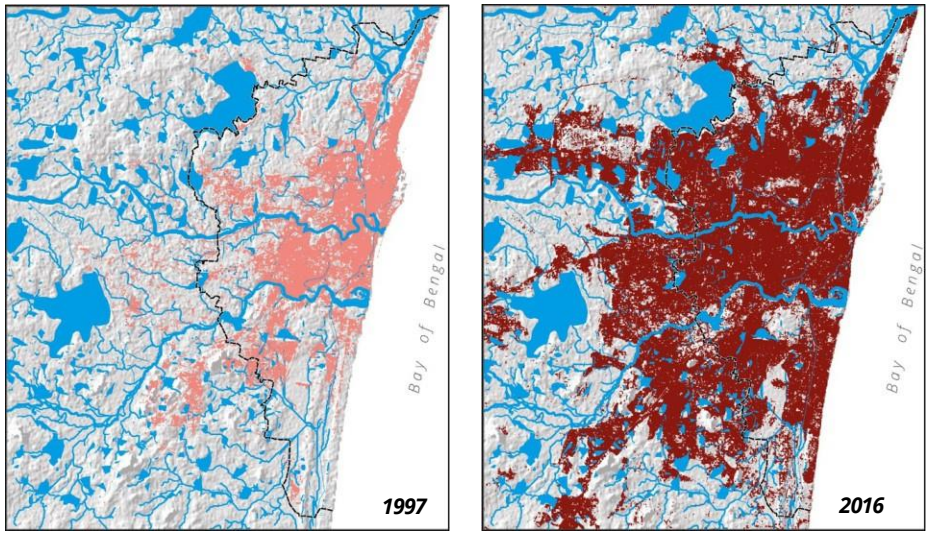
Flood Vulnerability: 41% of slums face inundation risks (7% high risk). 29% of GCC areas flood every 5 years.

Encroachments & Evictions: Slum clearances along waterbodies underway.

Sewage Crisis: Direct disposal > NGT intervention > New CMWSSB regulations.

Source: CCAP, 2022

CHANGES IN LAND USE IN CHENNAI



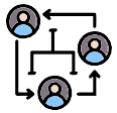
Source: IIHS, 2022

Canal to Madipakkam Lake

Adyar River (near Guindy)

Bridging the Gap: Strengthening Service Delivery

CHENNAI'S STRENGTHS:



- Each department has clear roles & responsibilities

- Diverse service providers (public & private)

- Established waste management systems

KEY GAPS TO ADDRESS:

- **Inter-Department Coordination** – Overlapping responsibilities, poor resource mapping, weak monitoring and execution delays - lack of formalised modalities

- **Land Constraints** – Fragmented land ownership limits GCC's infrastructure expansion due to the lack of a shared resource inventory.

- **Open Disposal** – Poor practices persist despite penalties, enforcement remains weak

- **Community Engagement** – Lack of participatory approaches, especially in service delivery

Collaborative Approach

- Plan presented to GCC and framework developed

EMPOWERING COMMUNITIES FOR RESILIENCE

- Recognised the need to engage communities for improved well-being and climate resilience.
- Implemented the framework in Kannagi Nagar, focusing on community-led WaSH practices and youth empowerment post-study.

CLIMATE RESILIENT WASH FRAMEWORK

	Immediate (1-6 months)	Short term (6-12 months)	Long term (>12 months)
Areas specific	Cleaning, repairs, awareness drives	Strengthening services, last-mile connectivity	Institutionalising resilient infrastructure
Across city	Resource mapping, formalising coordination	Climate risk integration, adaptive planning	Robust monitoring, long-term resilience strategies
Thematic: • Solid waste/ SWDs • Open disposal • Prevalence of vectors • Processes/ plans	Inspections, emergency clean-ups, awareness	Infrastructure upgrades, community-led solutions	Institutionalising climate-smart systems, nature-based solutions

Pathway to Resilience – From Framework to Impact

STEP 1: INTEGRATED PLANNING FOR RESILIENCE

- Uses the Climate-Resilient Urban WaSH Framework
- Aligns mitigation, adaptation & service delivery
- Targets infrastructure, behaviour, governance, and operations

STEP 2: MULTI-STAKEHOLDER COLLABORATION

- Framework enables coordination between government, service providers & communities
- Institutionalises local planning & resource-sharing

STEP 3: FROM RESEARCH TO IMPACT

- Tailor to context and translate to action
- Engage communities to strengthen service delivery and climate resilience

From on-going work at Kannagi Nagar

Thank You

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