Paani *aane* se *hone* tak

The social life of water infrastructure and governance in a slum resettlement neighbourhood in Bengaluru

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Inquiries

- **How** do people make water available for themselves in a slum resettlement neighbourhood in Bengaluru in 2024?
- **Why** have these ways of making water available emerged?
- **What** do these tell us about the nature of sub-ward scale urban water infrastructure and governance in Indian cities today?
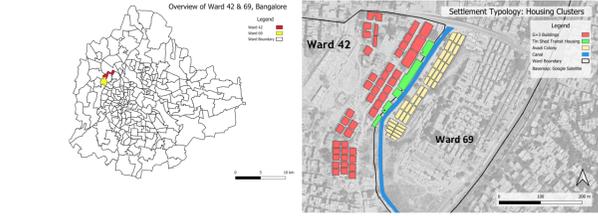
Methodology

Data Collection tools:

Our data collection exercise was spread across 3 months in late 2024 (Oct-Dec) and involved the following tools:

- **Semi-structured interviews** with water users and local-level water governance actors (n=53)
- **Neighbourhood-level infrastructure mapping** across three housing typologies through transect walks (n=3)

Sampling method:

Preliminary observations and transect walks helped us identify three major housing typologies that have evolved in the slum resettlement area in Lakshmi Devi Nagar. Once we identified the range of housing typologies, we used a dynamic combination of **non-probability sampling techniques** to arrive at our final sample:

- **Purposive sampling** of residents and users of different water infrastructure we mapped across 3 housing typologies
- **Convenience sampling** of residents who could speak any of the languages our team knew: Tamil, Dakhni and Hindi
- **Purposive and snowball sampling:** From among the initial set of participants, sampled through housing typology and infrastructure-based purposive and language-based convenience sampling, we used purposive and snowball sampling techniques to reach particular water actors (eg: bore operators, valve men, households in the command area of a particular water supply point, etc.)

Overview of Ward 42 & 69, Bangalore

Ward 42
Ward 69

Settlement Typology: Housing Clusters

GROUND FLOOR STRUCTURES, AVADI NAGAR

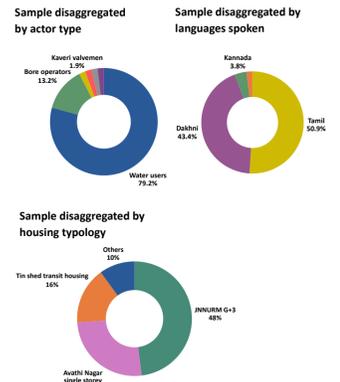TIN SHED TRANSIT HOUSING

GROUND+3 JNNURM HOUSING

Site context

Lakshmi Devi Nagar in north-western Bengaluru is one of the city's largest slum resettlement areas, spread across what were administratively BBMP municipal wards 42 and 69 until 2023. Households have been resettled by the Karnataka Slum Development Board (KSDB) in several waves of development-induced evictions throughout the city.

The housing quarters in the area include in-situ upgraded slums and others built from scratch for slum households evicted and resettled by KSDB. The oldest of these quarters is about as old as the Slum Board itself, dating back to the mid 1970s, and the latest ones have been built under JNNURM's BSUP Phase 2 between 2011-16.

In our research, we focus on water dynamics across **3 such housing typologies** in the area, each of which varies by materiality of the built unit and by elevation of the neighbourhood, producing different configurations of water supply. These include:

- **JNNURM G+3 vertical housing**, located at an elevation of 810-800 m, built by KSDB around 2009, as per BSUP Phase 1 design and operational SOPs the build, maintain, operate and transfer model
- **Tin-shed transit housing**, located at an elevation of 800 m, built around 2020 to temporarily house residents whose JNNURM building was burnt in an accident
- **Avadi Nagar single-storey row housing**, located at an elevation of 795 m, built in between 2001-04 by KSDB to resettle households from a slum near Cantonment railway station in north-eastern Bengaluru
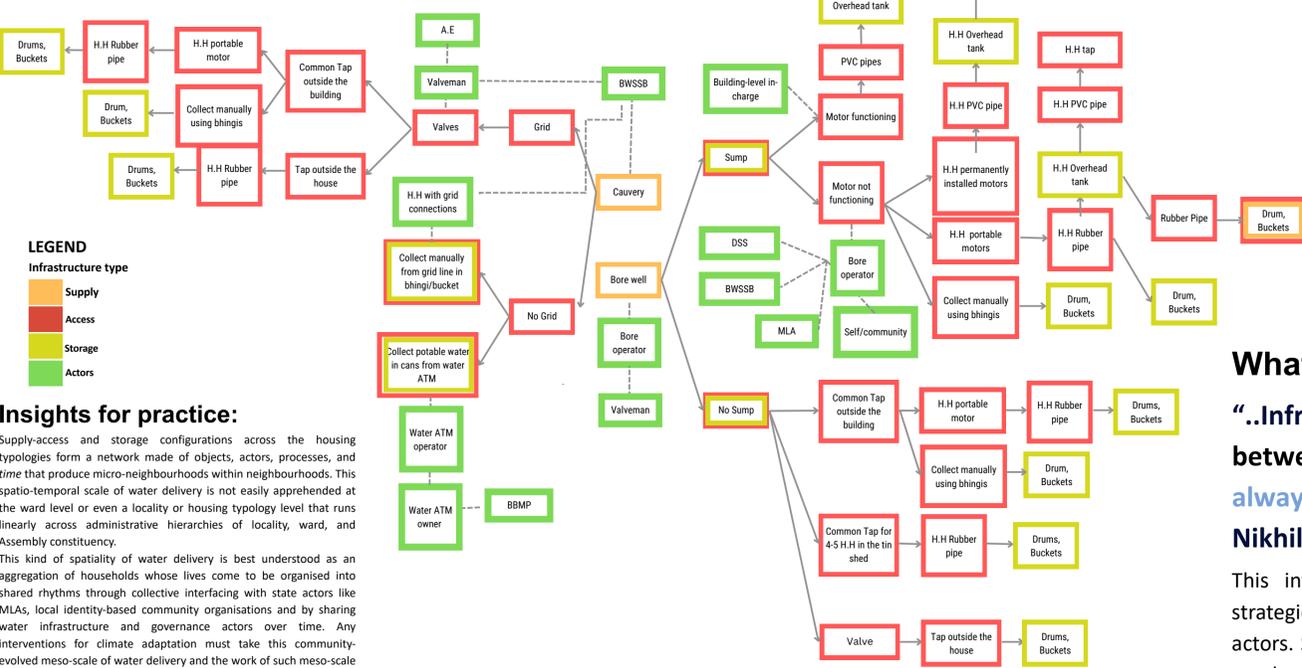
Sample disaggregated by actor type
- Kaveri valvemen 1.9%
- Bore operators 13.2%
- Water users 79.2%

Sample disaggregated by languages spoken
- Kannada 3.8%
- Dakhni 43.4%
- Tamil 50.9%

Sample disaggregated by housing typology
- Others 10%
- Tin shed transit housing 16%
- JNNURM G+3 48%
- Avadhi Nagar single storey 26%

Avadi Nagar ground floor housing
Sameer
Bore operator

Sameer is the bore operator for one of the three bores that make up Avadi nagar's supply of non-potable water. The ground-floor row housing settlement of Avadi Nagar sits next to a major stormwater drain flowing through western Bengaluru, where families have lived for 20 years. 2 new bores that service over 100 households in the neighbourhood were set up only a year and a half ago, after requesting the MLA, who paid for the bore

connection, the drilling, and to set up a grid of valves that ensures water travels and reaches horizontally across the gullies into the tap connections installed inside or outside each house.

When the lorry and the electrician came to dig borewells and set up the valves, households were able to decide where to put the taps to catch bore water when it would come. Some households preferred to get taps inside the house, while some others, whose households had, in the 20 years since they had moved to this KSDB 2-room unit, had families outgrowing the built unit, with adult sons and daughter-in-laws moving out into self-built rooms next door, preferred to get taps outside their house for convenient sharing of water across the pakka built unit and self-built kachha houses.

"Ever since this water has come in, our claim over Kaveri water has shrunk. There are 20 households here who are still not connected to any bore so they still rely on Kaveri. Now Kaveri water already comes so scantily, once every 7-8 days, so the people who release the Kaveri water up there do not let us take it. We also do not feel right collecting Kaveri water when there are others who need it more than us. So we let it go." Sameer tells us.

Image: One of the 2 new bore standposts in Avadi Nagar that the MLA helped install

Tin shed transit housing
Gulab
Bore operator

Gulab manages collections from each household in the tin shed settlement and pays them forward to Kumar. Himself a resident of the JNNURM G+3 housing complex, Kumar oversees repairs for several different bores and coordinates with bore operators across building complexes, earning him the metonymous title of 'Drum Kumar' with residents in the area. While the tin shed settlement was built to temporarily accommodate residents whose G+3 housing units have been in construction since 2021, Gulab and others have resided in Lakshmi Devi Nagar for over 20 years. Their current major source of non-potable water is patched together from 2 bores: one located within the settlement, turned on for about 2 hours once every alternate day and another bore connection that belongs to the G+3 JNNURM settlement facing the settlement.

The residents have scheduled the on-days for the bore within the settlement to complement the bore days of the JNNURM settlement, such that they have a daily water supply of 2 hours each. The access point for both these bores are common tap connections, connected to the bore standpost, from where residents fill buckets and drums for daily use.

Given the lack of space in the transit housing, households cannot always invest in huge water storage tanks. So a daily supply of bore water ensures that domestic needs of cleaning, bathing, and toilet are met adequately. Kaveri water, on the other hand is sparse and is also collected from a shared standpost from the JNNURM settlement facing the transit housing, every 8 days. While unfit for drinking, Kaveri water is referred to as 'meetha paani'. Drinking water, however, is bought from the water ATM at a standard 5 rupees for 20 litres.

Image: One of the 2 common access points from which transit housing residents draw their non-potable water supply

G+3 JNNURM housing
Thaayamma
Bore operator

In the G+3 vertical housing units of Lakshmi Devi Nagar, water moves through 3 infrastructural configurations to reach households. The central node holding these configurations together is a submersible bore pump, connected to one or more underground sumps, shared between 1 or 2 buildings of anywhere between 16 to 48 households. These were put in place as the primary water supply infrastructure at the time that these buildings were constructed under BSUP. In the plan's imagination, water from bores would fill these sumps, fitted with motors, which would pump the water up to overhead tanks. From these tanks, water would flow to tap connections inside each built unit.

Thaayamma, a resident of one such building is the community-nominated in-charge of 2 such submersible bore pumps, connected to 4 ground level sumps, shared by 5 buildings. The elder sister of a karyakarta, associated with the BJP MLA for their ward, Thaayamma has grown up in the area and has been in charge of the 2 bores since the infrastructure was put in place 15 years ago. In her area, the sumps were never connected to overhead tanks. So each household, as per their own means, has configured for itself, ways of making water available.

Once every 2 days, Thaayamma switches the borewell motor, which pumps for 2-3 hours until a majority of the families store enough water until the next bore day. Some have gotten their own PVC pipes connected to privately owned overhead tanks to ensure in-house water supply. Others have bought portable water motors connected to rubber pipes that pump water up to a tank or drum in their house when the bore is turned on. Some others manually collect and carry water from the sump using pots and buckets. If a household happens to miss the water schedule, they request that Thaayamma turn on the bore for a few minutes. In most cases, she gives in to such requests, while warning her neighbours that such exceptions cannot always be accommodated. Typically, the bore needs repair once every 6 months; households pool money and call on a local leader, who oversees such repairs. For her work as a bore operator, Thaayamma collects a monthly payment of 40 rupees from each household, making concessions and context-based exemptions for households managing experiencing hard financial times, like increased medical expenses.

Image: Rubber pipes connected to households' potable motors are thrown in the building's sump, to pull water up to households' storage units

Image: Household installed PVC pipes connected to the building's shared sump that run up the building to the overhead storage tanks

Water infrastructural-governance configurations across housing typologies

LEGEND
Infrastructure type
- Supply
- Access
- Storage
- Actors

Insights for practice:

Supply-access and storage configurations across the housing typologies form a network made of objects, actors, processes, and *time* that produce micro-neighbourhoods within neighbourhoods. This spatio-temporal scale of water delivery is not easily apprehended at the ward level or even a locality or housing typology level that runs linearly across administrative hierarchies of locality, ward, and Assembly constituency.

This kind of spatiality of water delivery is best understood as an aggregation of households whose lives come to be organised into shared rhythms through collective interfacing with state actors like MLAs, local identity-based community organisations and by sharing water infrastructure and governance actors over time. Any interventions for climate adaptation must take this community-evolved meso-scale of water delivery and the work of such meso-scale water actors as bore operators, as a scale of relevance to urban water intervention design.

What does the infrastructure reveal about the nature of water supply?

Supply
How does water **come**?
தண்ணீர் எப்படி வருது ?
पानी कहाँ से आता है ?

Availability

Access
How do you **take** the water when it comes?
தண்ணீர் எப்படி பிடிப்பிங்க?
आप पानी कैसे लेते हो ?

Storage
How much water do you **have**?
भले के बाद आपके पास कितना पानी होता है?
தண்ணீர் எதுல ரோப்புறிங்க?

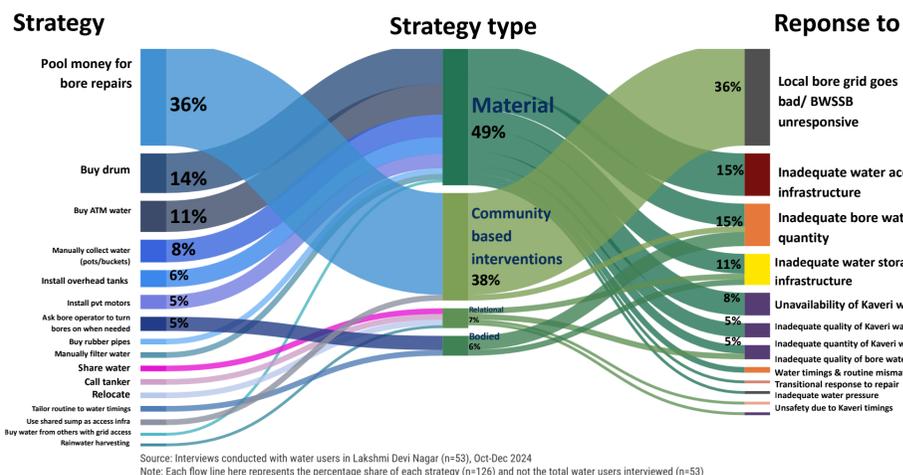## What do we call this way of living with water?

"..Infrastructure as a process of making relationships between bodies and things that is always in formation and always coming apart."
Nikhil Anand, 2018

This infrastructural assemblage is also a manifestation of several coping strategies, evolved across scales: by households, shared water actors and political actors. Seen from the vantage of households and individual water users, coping can be understood as a range of **relational, material** and **bodied** responses to buffer against the effects of felt water unreliabilities (quantity, quality, timings, pressure)

Keeping water available in Lakshmi Devi Nagar, Bengaluru 2024

Coping strategies adopted by households and the infrastructural ruptures they are responding to

Strategy	Strategy type	Reponse to
Pool money for bore repairs — 36%	Material 49%	Local bore grid goes bad/ BWSSB unresponsive — 36%
Buy drum — 14%		Inadequate water access infrastructure — 15%
Buy ATM water — 11%	Community based interventions 38%	Inadequate bore water quantity — 15%
Manually collect water (pots/buckets) — 8%		Inadequate water storage infrastructure — 11%
Install overhead tanks — 6%		Unavailability of Kaveri water — 8%
Install pvt motors — 5%	Relational 7%	Inadequate quality of Kaveri water — 5%
Ask bore operator to turn bores on when needed — 5%	Bodied 6%	Inadequate quality of Kaveri water — 5%
Buy rubber pipes		Inadequate quality of bore water
Manually filter water		Water timings & routine mismatch
Share water		Transitional response to repair
Call tanker		Inadequate water pressure
Relocate		Unsafety due to Kaveri timings
Tailor routine to water timings		
Use shared sump as access infra		
Buy water from others with grid access		
Rainwater harvesting		

Source: Interviews conducted with water users in Lakshmi Devi Nagar (n=53), Oct-Dec 2024
Note: Each flow line here represents the percentage share of each strategy (n=126) and not the total water users interviewed (n=53)

Insights for further research:

Stitching grids and nets: How much "adjusting" can a household do?
Towards developing better measures of inferring household-level infrastructural coping capacity

Listening to the stitches speak: How much "adjusting" should a household do?
Towards methods of strengthening the infrastructure assemblage at the sub-neighbourhood scale to minimise coping at the household and individual water user scale

Cauvery: limbs of a 'broken promise'
Local level Bore grid
Self-sewn safety nets