

POLICY BRIEF

The Arid City of Bhuj

January 2025

Bhuj, a city with a population of 0.21 million[1], lies in a water-scarce region and is home to a 450-year-old man-made lake – Hamirsar Lake, created to store water and sustain the city. Over the years, the lake has become polluted and has shrunk in size, thereby losing its ability to recharge the aquifers in the city. The Water4Change project applied a multi-disciplinary lens to analyse the complex challenges facing the urban water system in the city, providing an integrated systems approach in developing interrelated technological, institutional, and financial solutions for sustainable urban water management. The findings of the analysis and the recommendations to address these are provided in the sections below.

Main findings

The findings capture the key bottlenecks identified in the analysis.

- **Limited community participation in local decision-making -** Although mechanisms for community participation exist, their implementation is limited. There is an increased reliance on state-led directives for local issues in Bhuj, which hinders effective participatory governance.
- **Undervaluation of traditional knowledge -** Traditional local knowledge, wisdom, and awareness have faded over time. There is high reliance on modern, costly grey infrastructure solutions, moving away from traditional, low-cost decentralised, sustainable water management practices. Consequently, the community is becoming increasingly disconnected from the maintenance and management of the city's water resource.
- **Limited community awareness -** Increased urbanisation and the introduction of a piped water system[2] have increased the reliance on external water resources, while the city's existing water resource lies abandoned and unmaintained. This has prevented the public from taking up an active role and getting involved in the maintenance and management of the existing water resource.
- **Successes limited to pilots -** Bhuj has successfully implemented pilot projects that integrate grey and green solutions to conserve water over time through participatory actions. However, these pilots have not been replicated, owing to limited technical capacities, financial resources, and statutory support necessary for effective upscaling.
- **Loss of water due to climate -** Bhuj's arid climate poses significant challenges for water conservation, with high percentages of precipitation lost to surface runoff and evapotranspiration.[3] There is currently a lack of innovative approaches to address water loss due to these phenomena and to facilitate effective aquifer recharge, particularly in the 44.87 km² watershed area of Hamirsar Lake.
- **Complex institutional arrangement -** The implementation of watershed management plans in Bhuj requires coordination among multiple stakeholders, such as the Bhuj Area Development Authority (urban development authority), different departments of Bhuj

Nagar Palika (BNP) (urban local body), the State's irrigation department, the Central Ground Water Board, the Forest Department, etc. The complexities associated with interdepartmental coordination significantly hinder the effectiveness of the plans.

Recommendations

The recommendations are essentially developed for the consideration of urban local bodies - the executive (Commissioner) and political (Mayor) leadership in the city.

1. Strengthen citizen engagement

Enhance community capacity - Regular training programmes for citizens on topics such as water monitoring and policy advocacy, building on initiatives like Bhujal Jankar, should be implemented. Additionally, the capacities of community members should be enhanced to take on roles such as mediators, conflict managers, and data organisers to maximise community participation. Furthermore, they must be empowered to act as knowledge brokers, making complex information accessible and understandable to all citizens.

Make statutory development plans more accessible - Development Plans or Master Plans act as the only legal tool for a city's growth and development. They are meant to be used by the citizens and local communities, who are often unaware of them or do not understand them. Therefore, it is crucial for citizens to understand these documents. In India, the preparation of the statutory development/master plan is a participatory process - stakeholders have the right to raise objections to the draft plans prepared by the authorities. However, they can only provide feedback on the documents if they understand them. Making these documents free of jargon and more illustrative will improve their clarity and legibility, thereby making the process truly participatory.

Foster participatory budgeting and finance - Participatory budgeting and participatory grant-making strategies should be adopted to ensure that financial resources are allocated in ways that meet local needs, fostering more effective and inclusive urban water management. Along with raising awareness, participatory budgeting will also ensure accountability among multiple stakeholders. This process could involve the official sharing of financial reports of major infrastructure projects, as well as other government programmes and missions, to create a healthy dialogue among communities about ongoing projects and initiatives.

Engage citizens - Both online and offline feedback mechanisms should be implemented for maximum outreach and dialogue with citizens. The Master Plan-making process needs to be improved to make citizen participation meaningful (beyond tokenism) and to incorporate citizen feedback. Additionally, government spaces such as schools should be utilised for community meetings, and regular children's activities should be hosted to promote water-sensitive behaviour. A dedicated day can be scheduled (e.g., the first Saturday of the month) for community participation in activities like water walks and lake dredging.

Revive existing platforms – There were several citizen and CSO-led platforms and activities in Bhuj that worked towards strengthening awareness on the city's water legacy and issues, such as Jalgatha ("water story"), Jalpedi ("water walk"), and publications such as the Bhuj Patrika, newspaper articles, and radio shows on urban water management. There used to be festivals and cultural events near the waterbodies of Bhuj that fostered citizen engagement. However, these seem to have lost momentum over time. These platforms and events should be revived as a convenient and pragmatic solution to re-initiate, promote, and mainstream discussions on water sensitivity, and increase citizen engagement. Furthermore, a dedicated department can be established within the urban local body to focus on reviving, maintaining, and amplifying these existing platforms. Local communities and CSOs can facilitate these efforts through coordination with this department.

- BNP to facilitate the formation of ward- or neighbourhood-level platforms (such as Resident Welfare Associations) and/ or make them functional, to hold regular meetings that share information with and engage citizens on the status of water in the city, and co-design ways to promote adoption of water sensitive behaviour and practices in the city[4].
- BNP to partner with civil society organisations to engage and mobilise citizens for the activities mentioned above.

2. Adopt appropriate solutions for infrastructure creation

Revive traditional knowledge - Traditional knowledge and wisdom should be integrated into plans. For instance, rainwater harvesting and the creation of groundwater recharge structures in neighbourhoods (as implemented in Jubilee Colony), water sponges to collect excess stormwater, and decentralised wastewater treatment plants4 could be implemented. Furthermore, Bhuj's traditional water management approach of interlinking catchments provides important lessons for modern urban water management. Urban planning must integrate catchment-level planning, learning from the city's history and long-term vulnerability to climate-induced risks. These traditional solutions should be incorporated according to the context.

Adopt blue-green infrastructure solutions - Blue-green infrastructure solutions should be adopted to mitigate water challenges. These solutions, such as blue-green roofs, vertical greens, permeable pavements, and rain gardens, could enhance water absorption and reduce runoff at site level. They must be incorporated as mandates in the city's development regulations. These efforts can be initiated by the urban local body or other relevant government departments, first as pilots to demonstrate their benefits and test their suitability, and then be scaled up.

Invest in infrastructure to capture runoff - The city should invest in infrastructure to effectively capture and utilise runoff. This includes developing and maintaining systems for runoff harvesting, storage, and distribution. Such investments are critical for enhancing water self-sufficiency and mitigating supply shortfalls. By harnessing the runoff, Bhuj can potentially reduce its reliance on costly infrastructure for importing water from external sources. This strategy would not only promote self-sufficiency in water management but also offer economic benefits by minimising expenditure on water procurement from surrounding areas.

Proposed action point to adopt appropriate infrastructural changes:

- BNP to convene multi-stakeholder meetings, including representatives of Water Resource, Environment, and other relevant departments, academics, researchers, Civil Society Organisations, and community representatives to collectively brainstorm solutions to protect water bodies and plan appropriate infrastructure projects.

3. Strengthen institutions

Establish a dedicated role for lake development - Drawing lessons from the Lake Development Authority (LDA) in Bhopal, which improved departmental coordination, it is proposed that a dedicated role be created in an appropriate form (personnel, unit, department) in the municipal body (BNP), to manage and rejuvenate lakes and natural streams in the city. This dedicated role should operate as an extension of existing entities, with a clear focus on water conservation and infrastructure.

Recognise and empower Ward Samitis - Although not legally required in cities with populations under 300,000, Ward Samitis (as stated in the 74th Constitutional Amendment Act) can promote local governance. These Samitis should be officially recognised to validate their decisions, ensure government presence at their meetings, thereby enhancing accountability and implementation. Introducing rotating members and roles can prevent the dominance of a select few in these committees and encourage broader community involvement.

Form a People's Samiti (Transformative Urban Lab) - A central body that connects all Ward Samitis, acting as a Special Purpose Vehicle (SPV) to oversee collaborative decision-making among different stakeholders, must be established. The People's Samiti should also facilitate the understanding and dissemination of knowledge among the community.

Create an open access comprehensive information and data platform - A dynamic open-access platform should be created to host comprehensive information and data related to all aspects of water governance, to maintain transparency and guide research and data-informed decision making. The platform should integrate existing platforms and data systems (analogue and digital) that share piecemeal information on urban water systems in Bhuj, to provide a holistic understanding of the existing system and the status of water in the city. The integrated platform can comprise information managed by

government departments at multiple levels (state, district, city). It will be imperative to prioritise timely updates of the comprehensive platforms (including spatial and non-spatial datasets). This platform would help demystify the complex web of actors engaged in water governance and their respective roles and responsibilities. Additionally, the platform would raise multi-disciplinary awareness among the various actors responsible for governing different aspects of urban water systems. The platform could also enable dialogue among various actors at different levels. To facilitate large-scale access and engagement, this platform must be developed using contemporary communication tools such as social media.

Map existing resources - Mapping the number, distribution, and quality of green spaces, water bodies, drains (including lower-order streams), canals, and other water infrastructure and sources is needed to provide detailed insights into their current condition and potential. This information can guide the development of targeted plans and interventions aimed at maintaining, protecting, or restoring these resources. By increasing awareness of the water system among urban local bodies, this approach can help optimise hydrological functioning and enhance overall water management efforts.

Foster collaborations for a multi-stakeholder platform - Partnerships between government and non-government agencies should be formed to create new data and update old data sets to contribute to knowledge creation on urban water systems. Multi-stakeholder platforms including academia, research organisations, NGOs, philanthropy, and the private sector, should be used to identify competitive and co-designed solutions for scaling up. The integration of citizen science data should be encouraged through partnerships to support official data, with mechanisms for validating and incorporating data collected by citizens to enhance the overall data repository.

Encourage inter-city cross-learning and exchange - Bi-annual exchanges with cities of similar size or with similar challenges should be organised to share learnings and successes in improving and enhancing community participation in local governance. Field trips and other interactive events can be organised to strengthen ties and promote continuous learning and improvement.

Secure funds - External grants must be identified and mobilised to fund governance initiatives devised by Ward Samitis (in coordination with the municipality), to ensure sustainability. Additionally, the presence of several micro, small, and medium industries in the city should be leveraged by the local administration to raise funds for the implementation of pilot projects and/ or upscaling. Private actors, in return, could receive subsidies and incentives to actively engage in improving the city's water management. Transparency on fund usage, however, must be maintained for public trust and accountability.

Proposed action points to strengthen institutions:

- BNP to recruit specialists in planning, data science, behavioural sciences, ecology, and hydrogeology on longer-term contracts to adopt a holistic approach to water, beyond infrastructure.
- BNP to use citizen engagement platforms at the ward or neighbourhood level to invite suggestions and feedback on plans as well as identify priorities for the short, medium and longer terms, respectively.
- BNP to ensure that grievance redressal channels are functional, dedicate resources to make citizens aware of their existence and use, and strengthen these channels in the process.
- Utilising data sets from different departments, BNP to own and lead the consolidation of water-related data to create one comprehensive data set. BNP to timely update data and check and resolve any data inconsistencies.
- BNP to make data public and share it on multi-stakeholder and citizen platforms as part of awareness raising.
- BNP to engage the respective line departments to prepare a realistic budget estimate to ensure sustainable and safe water supply and sanitation services to all, covering capital expenditure as well as costs of software interventions such as planning, community awareness, monitoring of services, necessary human resources, and other related costs.
- BNP to consider blended finance to address the funding gap in providing sustainable and safe water and sanitation services to all.

Endnotes

1 Census of India 2011

2 Sheth, D. and Iyer, M. 2021. Local water resource management through stakeholder participation: case study, arid region, India. Water Practice and Technology (2021) 16 (2): 333–343. **doi.org/10.2166/wpt.2021.025**

3 Surface runoff constitutes 35.87% of the total annual precipitation (which can rise to 64.51% during extreme events, e.g. the Monsoons of 2003). This leads to a potential loss of 7027.012 ML/ year of water. Furthermore, evapotranspiration accounts for a significant loss - approximately 55% of the water budget.

4 The Hunnarshala Foundation developed a pilot in Banker's Colony in Bhuj.

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