

POLICY BRIEF

The Coastal City of Kozhikode

January 2025

Kozhikode, a coastal city with a population of 0.61 million[1], is known for its lush green surroundings, substantial rainfall, and wetlands of national importance. Yet, local water sources such as wetlands, ponds, and drainage systems are facing severe threats and are in desperate need of attention, protection, and restoration. 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.

- **Loss of traditional knowledge and practices -** Kozhikode has a rich tradition of communal practices and knowledge related to its water system, such as the creation of locally made temporary dams, known as 'Korambu/Chira', which stretch across the mouth of channels, the designation of groves and ponds as sacred, and many more. This knowledge and these practices linked to hydrological processes and the ecosystem are gradually disappearing, impacting the maintenance of the water system.[2]
- **Increasing encroachments on water bodies -** Unplanned and rapid construction activities have encroached upon water bodies, reducing their size and capacity. The loss of natural water bodies and drainage systems also contributes towards urban flooding, which disproportionately affects socially vulnerable groups.[3]
- **Groundwater pollution -** Groundwater has traditionally been the city's primary source of drinking water. However, there has been a noticeable shift towards reliance on external piped water. This shift has led to a decreased focus on maintaining and protecting groundwater resources. Consequently, bacteriological contamination of groundwater has become a major concern in the city, making it unsuitable for consumption[4].
- **Gaps in data -** Institutional silos and the lack of standardised guidelines for water data management across relevant departments, limit the sharing, utilisation, and dissemination of data, thereby complicating informed decision-making. There is limited accurate, up-to-date, and comprehensive data on the state of local water resources. This data gap undermines efficient resource allocation, timely responses, and recovery actions for affected communities, often leading to regulations that are ineffective or counterproductive. Furthermore, it presents considerable challenges to the development and implementation of resilient strategies to address planning and management concerns.
- **Limited infrastructure -** Untreated wastewater from households and commercial establishments is often discharged directly into local water bodies due to inadequate drainage infrastructure, resulting in a significant decline in water quality.[5] Furthermore, the city's wastewater treatment facility lacks the capacity to meet its demands, compounding the issue. Additionally, the existing urban stormwater drainage system is incapable

of managing the high volume of water caused by extreme precipitation events, putting even more pressure on the infrastructure.[6] Overflow from rivers and canals, particularly in areas adjacent to the river, exacerbates the situation, further compromising the integrity of the infrastructure.

- **Limited institutional capacity -** Institutions often face challenges due to limited capacity to address water-related issues effectively, and regular capacity-building programmes are not consistently implemented. Additionally, the adoption of new technologies and advanced monitoring methods remains limited. Policy revisions are infrequent, and the enforcement of existing policies is relatively weak. These limitations in governance contribute to diminished public trust in government-led initiatives.
- **Limited platforms for public engagement -** Non-participatory processes often result in decisions that are not well-formulated. The limited availability of platforms for public engagement restricts community involvement in decision-making. Inadequate public engagement also undermines the preservation and transmission of traditional practices and knowledge related to water resource management.

Recommendations

The recommendations are primarily developed for the consideration of urban local bodies and other key stakeholders involved in the water resource management of the city.

1. Strengthen participatory processes

Facilitate community participation - To bring communities together for discussions and actions on local water management, ward-level social platforms should be established and maintained. With the participation of representatives from local self-governments, relevant departments, and academic institutions, these multi-stakeholder platforms will serve as a forum for sharing knowledge, identifying issues, and developing solutions. Leveraging the collective knowledge and resources available through these platforms will foster community-driven water management initiatives, ensuring that local concerns and suggestions are incorporated into planning and decision-making processes. Furthermore, participatory budgeting and participatory grant-making should be encouraged to ensure that financial resources are allocated in a manner that meets local needs, fostering more effective and inclusive urban water management.

Leverage local knowledge and practices - Developing and implementing educational programmes focused on local water resources will foster a deeper connection and understanding among students and the community, helping to cultivate a culture of water stewardship. It is essential to create an inventory of local knowledge related to hydrological processes and ecosystem services, as well as the vulnerable locations and communities involved. Integrating these practices into the urban water management agenda will validate and enhance their value, and improve the context-specificity of the urban plans[7], thereby continuing community engagement and empowering them in the process.

Implement targeted funding - Municipal finances should be dedicated to sustaining community practices that care for water and the environment. Also, targeted support to socially vulnerable populations, including resources for emergency preparedness, access to insurance, and financial assistance for recovery, should be made available. Investing in lower-income areas can address both ecological and social objectives.

Proposed actions to strengthen participatory processes:

- The Municipal Corporation to facilitate the formation of ward- or neighbourhood-level platforms (such as Resident Welfare Associations, which already exist in the city) and/ or make them functional, to hold regular meetings to share and engage citizens on the status of water in the city, and co-design ways to promote the adoption of water sensitive behaviour and practices in the city.
- The Municipal Corporation to partner with civil society organisations to engage and mobilise citizens in the activities mentioned above.
- The Municipal Corporation to make a budget estimate to ensure sustainable water and sanitation services to everyone in its jurisdiction, including costs beyond infrastructure creation, such as public engagement, necessary human resources and other software costs, and explore blended finance to fund these activities.

2. Adopt appropriate infrastructural changes (considering nature-based solutions)

Enhance infrastructure - The authorities needs to invest in expanding and upgrading stormwater drainage systems to handle higher volumes of water and identify critical sections of the system that are prone to flooding and network disruption.8 Additionally, green infrastructure solutions, such as existing traditional and communal practices, as well as green roofs, permeable pavements, and rain gardens, should be preserved or implemented to enhance water absorption, reduce runoff, and improve the system's effectiveness.9 Successful infrastructure projects should be showcased, and pilot studies should be initiated before large-scale implementation. This approach will help ensure public trust and contribute to the long-term sustainability of infrastructure projects.

Recover existing water bodies - A scientific approach needs to be considered for removing accumulated silt from riverbeds, wetlands, ponds and canals to increase their capacity to handle floodwaters. Accumulated silt poses a high flood risk in the floodplain areas. There is also a need to develop and enforce comprehensive sediment management plans that include monitoring and control of sediment sources.

Incorporate climate change – Climate change projections should be included in flood management planning to ensure long-term resilience.

Proposed action point to adopt appropriate infrastructural changes:

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

3. Strengthen institutions

Augment capacity - Implementing ongoing training programmes for departments involved in water management (such as the Kerala Water Authority, Kerala State Pollution Control Board, Local Self Governance Department, etc.) by collaborating with research organisations and capacity-building institutions (such as the Kerala Institute for Local Administration, National Institute for Urban Affairs, Centre for Water Resources Development and Management) will keep these departments updated on the latest good practices in water governance, technologies, methodologies, enhancing their ability to manage water resources efficiently.

Maintain transparency - The municipality needs to ensure transparency regarding data management, development plans, and policies by creating opportunities for negotiation among various local actors. This proactive approach will help to address issues more effectively and prevent conflicts from escalating to the point where citizens feel that protests are their only recourse.

Create Special Purpose Vehicles - The municipality can create Special Purpose Vehicles (SPVs) with the special task of breaking down silos and promoting collaborative efforts between different sectors. This will enhance resource mobilisation, innovation, and the overall effectiveness of water management strategies.

Proposed action points to strengthen institutions:

- The Municipal Corporation 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.
- The Municipal Corporation to use citizen engagement platforms at the ward or neighbourhood level to regularly share and invite suggestions and feedback on plans.
- The Municipal Corporation 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.

4. Strengthen data management

Create a baseline of existing natural resources - Spatial mapping of existing green spaces, surface water bodies and groundwater resources, along with an assessment of their current and potential conditions, can effectively inform local plans, budgets, and interventions focused on their maintenance, protection, and restoration. This will

enhance water system awareness in the urban local body and can facilitate the enhancement of the hydrological functioning of the system. This baseline mapping requires a collaborative approach involving citizen science, the municipality, local community groups, scientific institutions, and NGOs.

Integrate citizen science data - The integration of citizen science data should be encouraged to complement official data sources, with mechanisms developed for validating and incorporating data collected by citizens to enhance the overall data repository.

Create a central data repository - Creating a centralised data repository will allow stakeholders, including government agencies, researchers, and the public, to access reliable and up-to-date water data. This repository should be user-friendly and secure to facilitate broad usage. This approach is crucial for informed decision-making, enabling timely interventions, and ensuring sustainable water management in the face of growing urban challenges.

Proposed actions to strengthen data management:

- Utilising data sets from different departments - the Municipal Corporation to own and lead the consolidation of water-related data to create one comprehensive data set. The Municipal Corporation to timely update data and check to resolve any inconsistencies.
- The Municipal Corporation to make data available in the public domain and share the data on the multi-stakeholder and citizen platforms as part of awareness building.
- The Municipal Corporation to use the data for annual and longer planning purposes.

5. Update policies

Review policies for relevance - There is a need to establish a process for periodic review and revision of water management policies to ensure that these policies remain relevant and effective. Revisions should be informed by insights and knowledge generated through community platforms and other relevant sources.

Establish data collection and transparency protocols - There is a need for comprehensive policies for the collection, storage, sharing, validation, and dissemination of water-related data to ensure that necessary and verified data is collected in a timely manner and is available and usable by all stakeholders for decision-making and problem-solving. These clear protocols need to be established to ensure data integrity and accessibility. The policies should mandate that data on water across departments are to be consolidated in one place to enable comprehensive planning and monitoring.

Proposed actions to update policies:

- The State Government, in collaboration with the Municipal Corporation, to engage subject matter experts and citizens to conduct periodic reviews of existing policies, inviting suggestions and feedback.
- The Municipal Corporation to utilise public engagement platforms to collect feedback and recommendations and periodically share these with the state government.

Endnotes

1 Census of India 2011

2 Debnath, S., Adamala, S., & Palakuru, M. 2020. An overview of Indian traditional irrigation systems for sustainable agricultural practices. Int J Mod Agric, 9, 12-22.

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3 Dave, R., Bhatia, U., 2024. Unveiling Socio-economic Inequity in Local-Scale Compound Flood Risks in Indian Coastal City. **doi.org/10.5194/egusphere-egu24-733**

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5 Sruthi, K.V., Navaneeth, A., Harikumar, P.S., 2023. Assessment of water quality and ecosystem health of a canal system during the lockdown period. Sustain. Water Resour. Manag. 9, 5. **doi.org/10.1007/s40899-022-00784-0**

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7 Van der Meulen, G.J.M., Bacchin, T.K., Van Dorst, M.J., 2024. The hydro-cultural dimension in Water-Sensitive Urban Design for Kozhikode, India. J. of Landscape Architecture, 18(2-3), 22-33. **doi.org/10.1080/18626033.2023.2347142**

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