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A Planning Study for Bogadhi Lake's Revitalization in Mysore: Handling Combined Environmental and Management Issues

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ABSTRACT

Urban lakes are vital for sustainable water management and ecological balance, yet Bogadhi Lake in Mysore City is severely degraded by encroachment and improper waste disposal. This study employs a mixed-methods approach, analysing primary survey data from 130 local stakeholders to diagnose environmental stressors and management gaps. Findings reveal a significant governance-community divide: while 56.9% of respondents perceive government management as incompetent, 62.3% express a latent willingness to participate in restoration efforts. Major stressors identified include construction debris (50%) and unauthorised dumping (46.9%), both of which have significantly reduced the lake's stormwater capacity. This paper proposes an integrated management framework centred on a Lake Stewardship Committee and Blue-Green Infrastructure. Recommendations include engineered wetlands for sewage treatment and community-based waste management systems to restore ecological integrity and enhance Mysore's urban resilience.

Key words: Urban ecosystem, Stormwater management, Lake encroachment, Ecological deterioration, Sustainability

INTRODUCTION

The natural landscapes and hydrological systems of cities have been drastically altered by urbanisation, resulting in the deterioration of water bodies that were formerly essential to maintaining ecological balance (Singh et al. 2021). According lakes are essential components of the urban ecology that offer a variety of ecosystem services, such as groundwater recharging, microclimate regulation, biodiversity conservation, and recreational activities to Kumar and Shah (2019), urbanisation has drastically altered natural landscapes and hydrological systems, leading to the deterioration of water bodies essential for ecological balance (Auddy et al. 2022). Urban lakes provide critical ecosystem services, such as groundwater recharge, microclimate regulation, and biodiversity conservation (Costadone and Sytsma 2022).

However, many urban lakes have become degraded water bodies, subject to eutrophication, siltation, and deteriorating water quality due to rapid, unplanned urban expansion, encroachment, and pollution (Ramachandra et al. 2018, Lin et al. 2021, Anh et al. 2023). Mysore City, historically known for its system of lakes intended for flood control, is experiencing a concerning depletion of resources, such as Bogadhi Lake, due to human pressures, inadequate drainage, and land-use changes) (Gowda and Sridhara 2013). One of these, Bogadhi Lake, on Mysuru's western outskirts, has been facing serious environmental and management issues due to growing human pressure, inadequate drainage, and a lack of integrated urban planning. Its ecological integrity has been disturbed by land-use changes, sewage inflow, and solid waste dumping (Ravindra et al. 2021).

An integrated strategy that incorporates stakeholder involvement, environmental restoration, and sustainable urban planning techniques is necessary for managing such urban lakes (Ostrom 2009, Sharma et al. 2018, Daigger et al. 2019). While

community-driven and participatory methods have shown better results in lake conservation, traditional top-down management strategies have frequently failed to yield long-lasting improvements (Krishnan et al. 2019). The wealth of information currently available demonstrates the ecological significance of urban lakes, the various risks they face, and the possible ways to restore them. Studies conducted on the lakes in Mysore have successfully identified pollution and encroachment issues (Ravindra et al. 2021).

Nevertheless, there are no efforts to research which combines technical and planning viewpoints with the perceptions of numerous stakeholders to produce a thorough, workable management framework for any lake (Nair and Krishnan 2018). Located on the western outskirts of Mysuru, Bogadhi Lake suffers from sewage inflow and solid waste dumping (Vidya et al. 2015). While traditional top-down management strategies have frequently failed, community-driven participatory methods have shown better results in lake conservation (Singh and Singh 2019). Current research has identified general pollution issues in Mysore's lakes, yet there remains a critical lack of studies that combine technical planning with stakeholder perceptions to produce a workable framework. This study seeks to close that gap by analysing the perspectives of 130 local stakeholders, identifying governance weaknesses, and proposing an integrated, long-term management strategy tailored to the lake's unique socio-environmental context.

MATERIAL AND METHODS

Study area

The study area is Bogadhi Lake in Mysore, the second-largest city adjacent to Bengaluru in the state of Karnataka, with a population of 9.21 lakhs (as per the 2011 census). Mysore City was the capital of the former princely state of Mysore and is the second-largest city. Also, it is the district headquarters of Mysore district, situated in the southernmost part of the state of Karnataka. It is located south-west of Bangalore, 140 km away. The city is well-connected by rail and air. The total geographical area of the Mysore local planning area is 6330700 ha, and the proposed conurbation area is 50900 ha. Mysore city has many major water bodies located within a well-defined landscape (Fig. 1). These include KRS Dam, Kukkarahalli Lake, Lingambudi Lake, Devanoor Lake, Dalvoy Lake, and Karanji Lake, and the most prominent valley is the Chamundi Hills. These hills, located at the foothills of Mysore, offer stunning

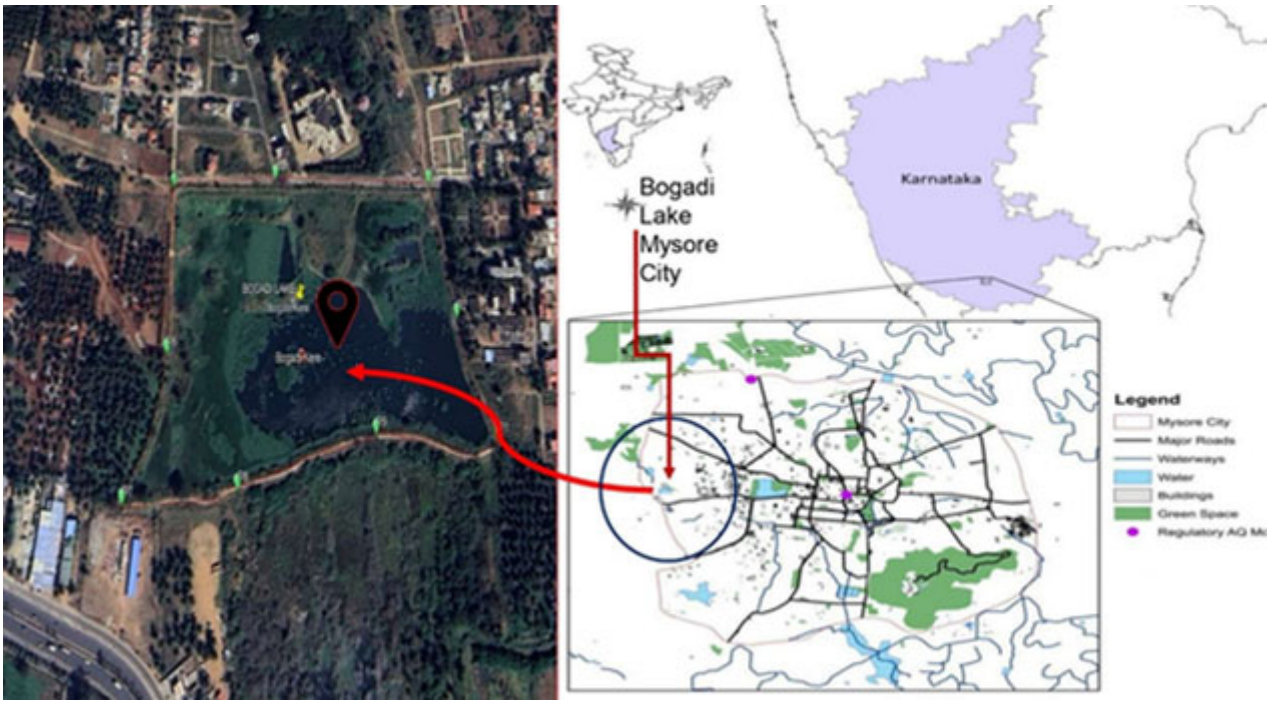

Figure 1. Study area map of Bogadhi Lake, Mysore City

views and are home to the Sri Chamundeshwari Temple.

Methods

Through the use of a cross-sectional survey method and a descriptive and analytical research design similar to Krishnan et al. (2019) utilised participatory approaches in South India to demonstrate that community-driven methods often yield more sustainable results than traditional top-down management, this study was able to statistically evaluate the current condition of Bogadhi Lake by documenting the opinions, attitudes, and experiences of stakeholders and locals at a particular moment in time. A structured questionnaire was used to gather primary data through a purposive, geographically bounded sample to capture the opinions and concerns of the population most directly affected by the lake's condition. By focusing on people living near Bogadhi Lake, this strategy ensured the gathered information reflected the real-life experiences of key stakeholders. The survey was conducted in person over a predetermined two-week period in nearby residential areas; 130 of the 150 surveys were completed. This sample provides a significant and pertinent evidence base for understanding hyper-local dynamics, offering crucial insights for a site-specific regeneration plan, even though it does not support statistical generalisation across the entire city.

To ensure direct interaction with the most affected stakeholder group, the survey was conducted over three weeks through in-person interviews at homes within a 500-meter radius of Bogadhi Lake. The sample size of 130 respondents is strong and suitable for a purposive sampling method intended to gather in-depth, qualitative insights from a geographically targeted group, even though it may seem small for wide statistical generalisation. This strategy prioritises the depth and relevance of data from core stakeholders over breadth for localised planning research focused on context-specific challenges, offering a strong evidentiary foundation for understanding on-the-ground perspectives and creating focused solutions.

We included demographic and historical records from the Census of India and the Mysore City Corporation, geographical maps, and pertinent policy documents from urban conservation projects such as the AMRUT program. We selected respondents with specific, situated knowledge of Bogadhi Lake and the sampling strategy used a non-probabilistic, purposive approach. The approach went beyond mere geographic convenience, even though it was carried out in residential areas near the lake. It sought people with first-hand, long-term experience of the location, such as long-term residents, regular users, and local community leaders, whose perspectives were considered crucial for identifying problems unique to the site. This approach is suitable for the diagnostic stage of a site-specific planning study, as it is typical of qualitative, exploratory research, where depth of insight from key informants is valued over broad statistical representativeness.

Our approach is a common qualitative research technique designed to ensure that respondents are members of the relevant target group. Using a purposive (judgmental) sampling technique, the study purposefully selected participants based on predetermined criteria crucial to the study's goal, including their proximity to Bogadhi Lake and first-hand experience. This method is ideal for collecting detailed, contextual data from a specific group of people whose real-world experiences are crucial for identifying hyper-local environmental and management problems. A crucial and relevant element in a site-specific planning process, it offers validated and targeted knowledge from the specific group most affected, even though it does not produce statistically generalisable data for the entire city.

RESULTS

A structured questionnaire was used to gather primary data on community attitudes using a non-probabilistic, purposive sampling technique. By focusing on locals living near Bogadhi Lake, our approach ensured respondents had first hand, extensive knowledge of the area. 130 people completed the in-person survey, which was conducted over two weeks in nearby residential areas.

The demographic profile of the 130 survey participants shows the largest group being 26-40 years old (39.2%) and a significant percentage being 41-60 years old (23.1%), a cohort that is primarily

Table 1. Respondents' demographic profile

Profile	Respondents category	Response (N)	%
Age	Under 18	5	3.8
	18–25	21	16.2
	26–40	51	39.2
	41–60	30	23.1
	Above 60	23	16.9
Gender	Male	85	34.6
	Female	45	46.64
Education level	PU / Secondary	22	16.9
	UG / Bachelor's	60	46.2
	PG / Master's	37	28.5
	PhD	11	8.5
Occupation	Student	34	26.2
	Government employee	28	21.5
	NGO worker	14	10.8
	Local resident	54	41.5
Residency duration	Less than 1 year	1	0.8
	1–5 years	20	15.3
	6–10 years	51	39.2
	More than 10 years	58	44.7

composed of individuals in their prime working years, indicating experiential viewpoints. Crucially, the majority of respondents have been locals for a long time; 44.7% have been there for more than ten years, and another 39.2% for six to ten years, demonstrating a profound familiarity with the lake's history and changes. A diverse range of perspectives from important stakeholder groups pertinent to urban lake management is ensured by the sample's high level of education, with the majority having at least a bachelor's degree (46.2% UG, 28.5% PG). Its primary composition is residents (41.5%), along with students, government employees, and NGO workers (Table 1).

The community is highly aware of and deeply concerned about Bogadhi Lake's degradation, with 89.2% of respondents having at least a passing familiarity with the lake (Fig. 2). The obvious identification of important environmental issues reflects this understanding, with general water pollution (30.8%) and the dumping of rubbish and plastic (42.3%) being regarded as the most important issues. There is broad agreement that the lake's water quality has been worse (76.2%). There is a clear discrepancy between the public's concern and the government's perceived response: the majority (56.9%) think the government has not managed the lake well, indicating a serious lack of institutional trust and governance that must be addressed for any restoration attempt to succeed.

There is a strong public disapproval of the way the government has managed Bogadhi Lake (Fig. 3). Their openions shows not only the government's responsibility but also the community's role to play. The main cited reasons for this neglect are poor coordination between departments (16.9%) and a perceived lack of awareness about the importance (48.5%). Moreover, majority of the respondents believe that existing awareness initiatives are insufficient (53.1%) and that the government has not done enough to prevent encroachment (56.9%), which supports this critique. Although a smaller but significant portion (20.8%) calls for stricter law enforcement, the community suggests a balanced approach to waste mitigation to address these governance failures. They strongly favour practical infrastructure improvements like more waste bins and recycling stations (33.1%) along with public

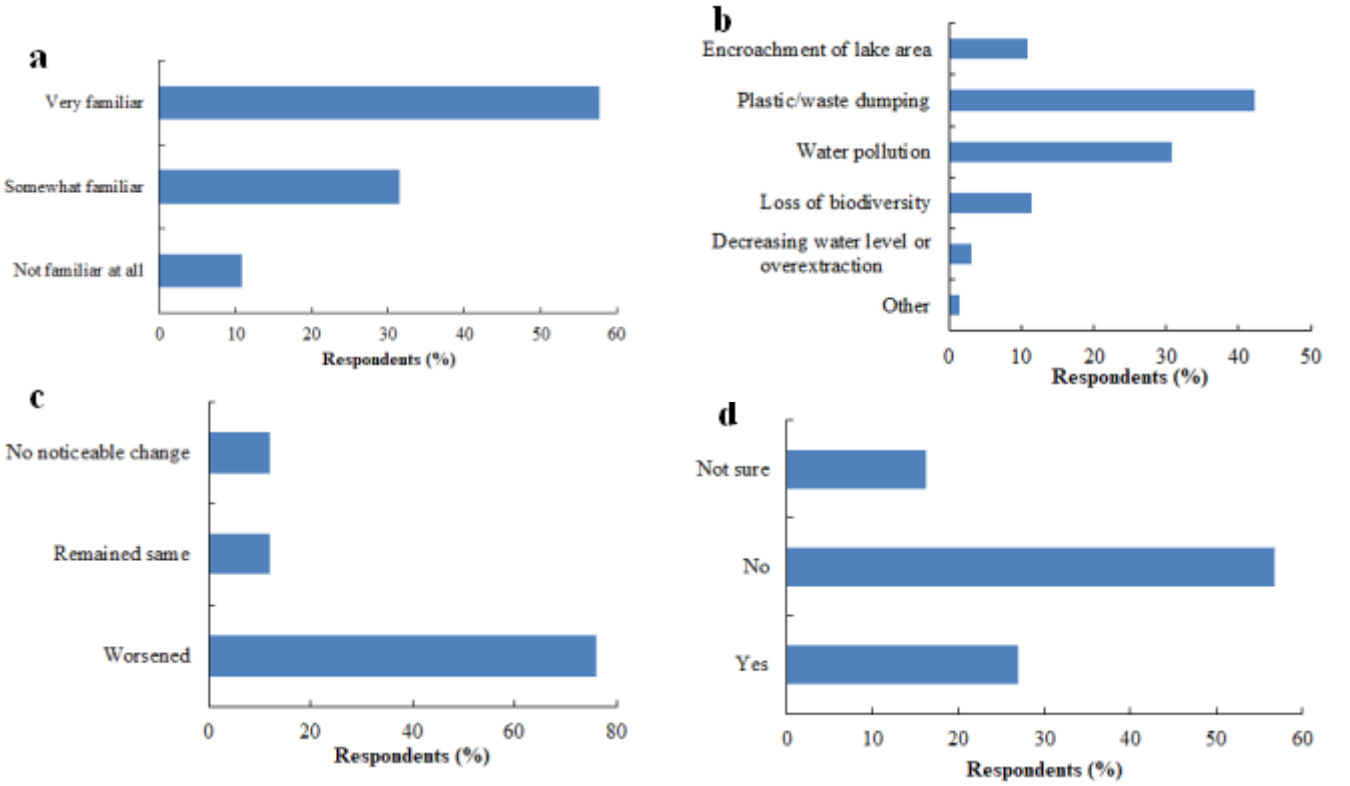

Figure 2. Respondents (N=130) opinion about the lake. a) familiarity about the lake; b) most significant environmental issue observed; c) change in water quality; d) effectiveness of government in management of the lake

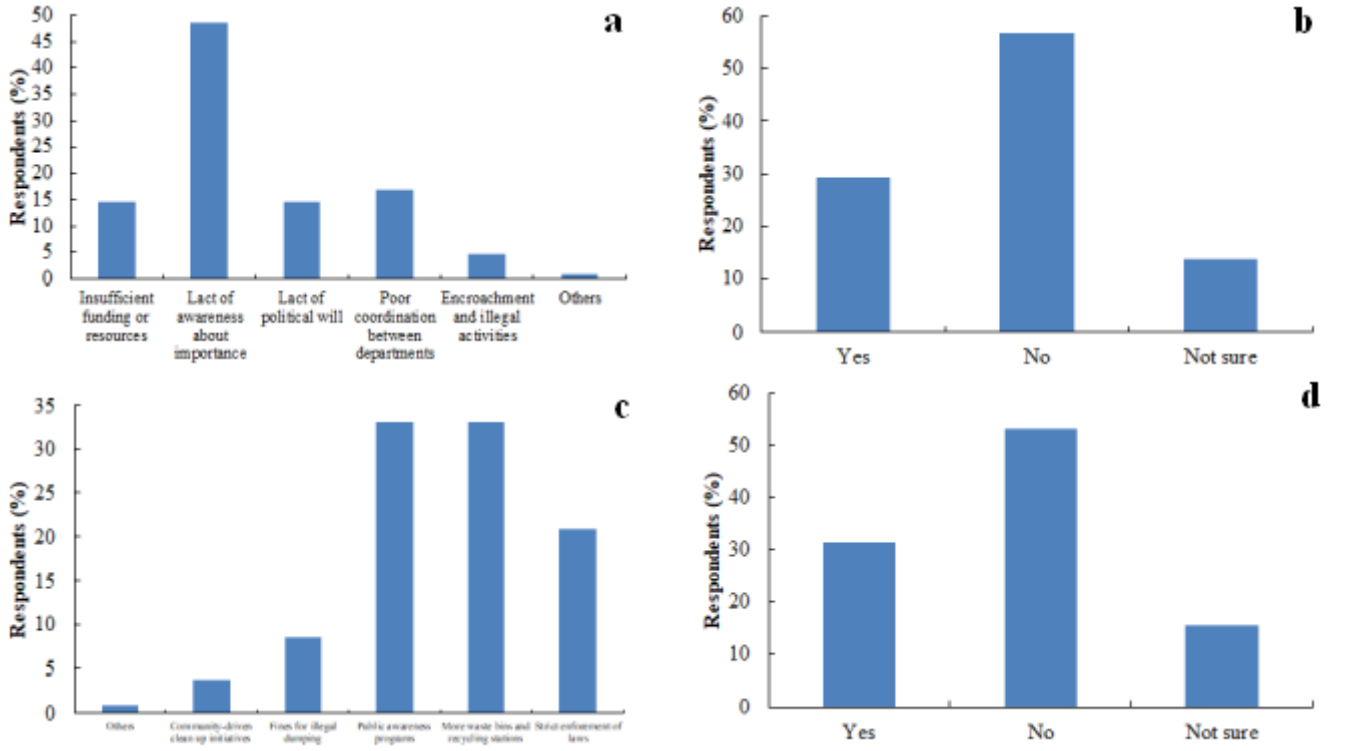

Figure 3. Respondents (N=130) opinion on the role of government in lake management. a) primary reason for lack of management; b) was able to stop encroachments; c) measures to mitigate the wastes in the lake; d) sufficient awareness camps conducted

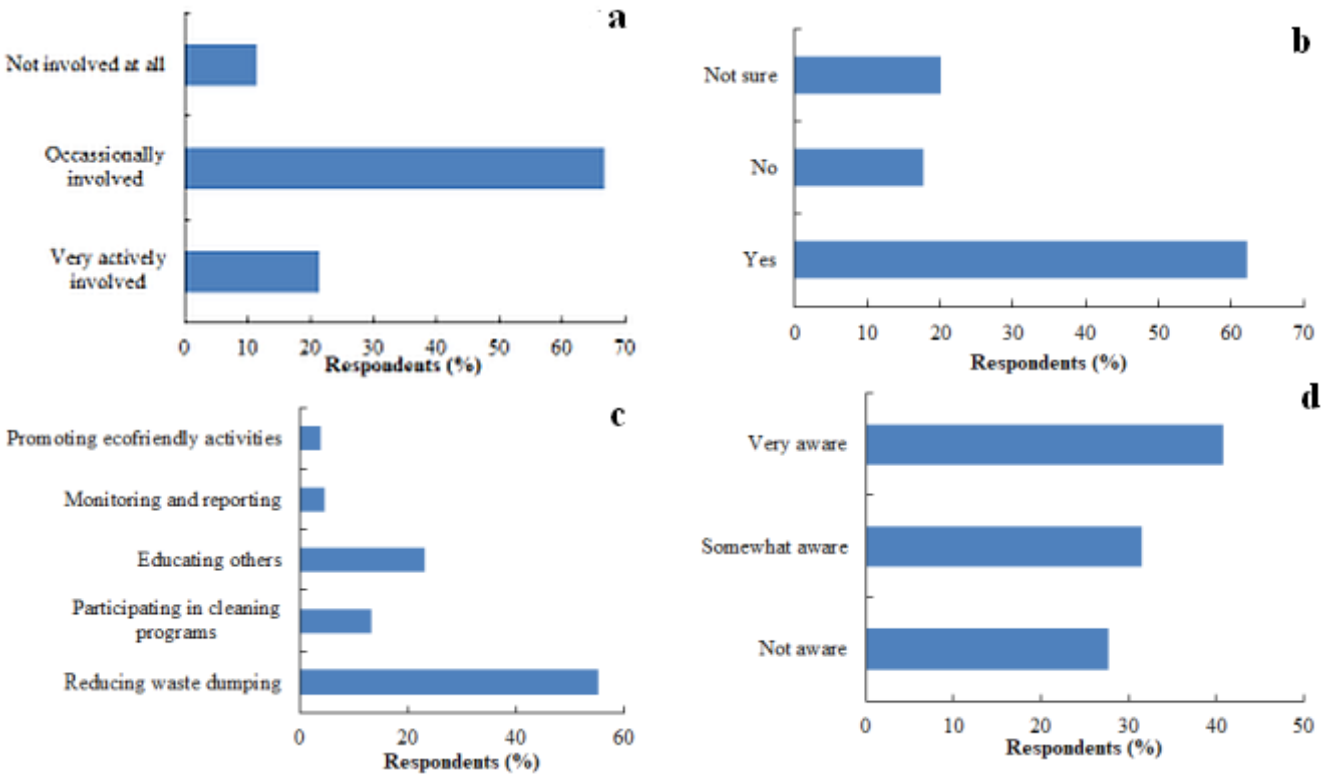

Figure 4. Respondents (N=130) opinion on community involvement and participation in the lake management. a) current level of involvement; b) willingness to get involved in future activities; c) role of local resident community; d) awareness status

awareness programs (33.1%). This suggests that the community wants both structural and educational solutions.

Although the community is currently mostly passively involved, there is significant potential for mobilisation (Fig. 4). A considerable latent willingness to participate in future initiatives (62.3%) exists, even though the majority of respondents (66.9%) participate only sometimes. A significant portion (27.7%) believes they are unaware of difficulties. This implies that a lack of opportunity and organisation, rather than apathy, is the main obstacle to engagement. With more than half (55.4%) citing reducing waste dumping as the primary duty for locals, the community's perspective on its role is evidently centred on proactive prevention, surpassing reactive actions such as taking part in cleaning initiatives (13.1%). This demonstrates shared knowledge that long-term fixes require adjustments to everyday behaviour, establishing the community as a prepared collaborator in coordinated, awareness-driven conservation initiatives.

The community has a clear vision for Bogadhi Lake that places equal emphasis on accessible recreation and ecological rehabilitation. The vast majority (73.1%) believe the lake has potential as a recreational area, and they clearly favour passive outdoor pursuits such as walking and jogging (53.8%). Near-unanimous agreement on the importance of balancing development and nature (89.2% ranked it extremely important) serves as the foundation for this vision, highlighting a community attitude that prioritises sustainability over aggressive development (Table 2). In the end, this viewpoint is motivated by a main concern for environmental and public health, as demonstrated by the 77.7% of respondents who think restoration should be given priority for these reasons. This places the lake not only as a recreational area but also as an essential resource for the community's welfare.

A perceived lack of government action was selected by over half of respondents (46.9%) as the single largest obstacle to Bogadhi Lake's sustainable development (Fig. 5). The community's response to this question was unambiguous. Other possible

Table 2. Recreational development and sustainable planning

Utilization of lake	Response options	Response (N)	%
Potential as a recreational space	Yes	95	73.1
	No	22	16.9
	Not sure	13	10
Desired recreational activities	Walking and jogging paths	70	53.8
	Boating or water sports	15	11.5
	Cycling trails	22	16.5
	Parks and gardens	14	10.8
	Open-air events	5	3.8
	Wildlife observation areas	3	2.3
	Other	1	0.8
Importance of balancing development and nature	Very important	116	89.2
	Somewhat important	11	8.5
	Not important	3	2.3
Prioritize restoration for public/environmental health	Yes	101	77.7
	No	14	10.8
	Not sure	15	1.55

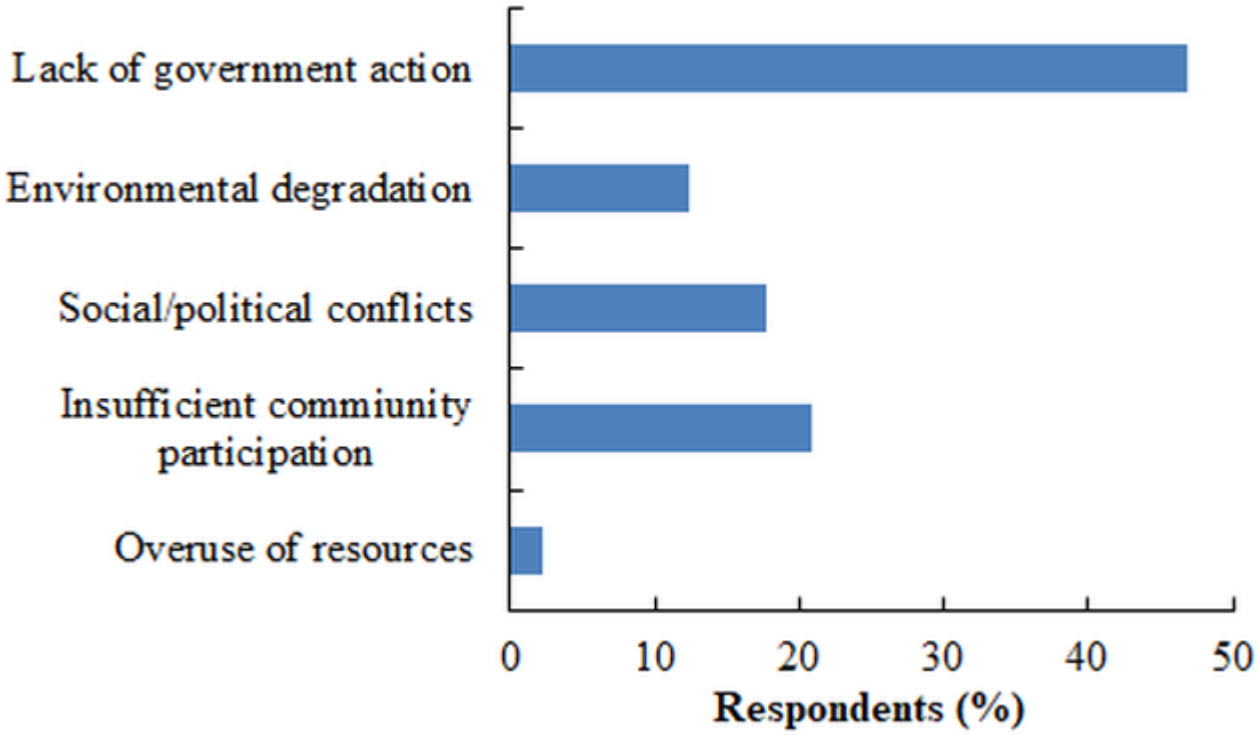

Figure 5. Respondents (N=130) opinion on biggest challenges in sustainable management of lake

barriers, such as insufficient community participation (20.8%) or social/political conflicts (17.7%), are greatly outweighed by this conclusion, which even goes beyond the issue of environmental degradation itself (12.3%). The public believes that government inaction is the main obstacle to be removed to enable efficient conservation and management of the lake, more than any other social or environmental factor. This result effectively combines the central theme that emerged from the present work.

The main source of contamination in Bogadhi Lake is construction debris (50%) and household

garbage (25.4%). Perceived effects are severe, with the most common outcomes being poor water clarity and odour (30.8%) and decreased biodiversity (45.4%). Encroachment is a serious problem; the most frequent practice is unauthorised dumping (46.9%), and most people (61.5%) think it significantly reduces stormwater capacity, clearly linking land misuse to hydrological function (Table 3). This is made worse by the perception that the current infrastructure is mainly insufficient; 44.6% of respondents said the stormwater drainage system was poorly maintained and ineffective. There may

Table 3. Environmental planning and management issues

Planning issues	Response options	Response (N)	%
Primary source of pollution	Industrial waste	17	13.1
	Domestic waste	33	25.4
	Construction debris	65	50
	Agricultural runoff	9	6.9
	Plastic waste	4	3.1
	Waste from tourism/events	1	0.8
	Other	1	0.8
Impact of pollution	Decreased biodiversity	59	45.4
	Increased algae blooms	19	14.6
	Poor water clarity and odour	40	30.8
	Loss of aquatic life	6	4.6
	Deterioration affects communities	5	3.8
	Other	1	0.8
Significance of illegal encroachment	Very significant	80	61.5
	Somewhat significant	26	20
	Not significant	15	11.5
	Not sure	9	6.9
Common encroachment activities	Residential construction	28	21.5
	Commercial developments	17	13.1
	Roads and infrastructure	18	13.8
	Unauthorized dumping	61	46.9
	Unauthorized recreational facilities	3	2.3
	Other	3	2.3
Impact of encroachment on storm water	Significant impact (reduces capacity)	80	61.5
	Moderate impact	29	22.3
	Little to no impact	6	4.6
	Not sure	15	11.5
Observed invasive species	Yes	40	30.8
	No	73	56.2
	Not sure	17	13.1
Role of urban development in degradation	Major role	79	60.8
	Moderate role	31	23.8
	Minor role	10	7.7
	No role	10	7.7
Most pressing environmental threats	Climate change	18	13.8
	Encroachment and land use change	18	13.8
	Pollution	58	44.6
	Deforestation and loss of vegetation	17	13.1
	Invasive species	10	7.7
	Over-extraction of water	6	4.6
	Other	3	2.3
Sufficient green cover	Yes, well vegetated	66	50.8
	No, significant loss	53	40.8
	Not sure	11	8.5

Planning issues	Response options	Response (N)	%
Frequency of waste accumulation	Very frequently (daily/weekly)	54	41.5
	Occasionally (monthly)	59	45.4
	Rarely (once/twice a year)	9	6.9
	Never	1	0.8
	Not sure	7	5.4
Reason for waste accumulation	Lack of waste management infra.	40	30.8
	Insufficient public awareness	48	36.9
	Lack of law enforcement	24	18.5
	Improper disposal by people	13	10
	Poorly maintained bins/points	3	2.3
	Other	2	1.5
State of storm water drainage infra.	Sufficient and well-maintained	37	28.5
	Somewhat inadequate	25	19.2
	Poorly maintained and ineffective	58	44.6
	Not sure	10	7.7
Adequate flood prevention measures	Yes, sufficient	83	63.8
	No, lacking	30	23.1
	Not sure	17	13.1
Priority infrastructure for storm water	Storm water treatment plants	56	43.1
	Retention/detention ponds	17	13.1
	Improved drainage systems	47	36.2
	Green infrastructure	6	4.6
	Upgraded waste disposal	2	1.5
	Other	2	1.5
Sufficient resources allocated by city govt.	Yes	51	39.2
	No	66	50.8
	Not sure	13	10

be a gap in public awareness; nevertheless, the majority (63.8%) strangely think flood control methods are adequate. The community's preferred solutions centre on engineered infrastructure, such as stormwater treatment plants (43.1%) and improved drainage systems (36.2%), while the majority (50.8%) believe the city government has not allocated enough resources to address these intricate, interconnected issues. In the end, pollution (44.6%) is viewed as the most pressing threat.

A total of 73.1% of respondents reported experiencing waterlogging occasionally to always, indicating a real drainage issue in the town (Table 4). Despite this, opinions on the lake's contribution

Table 4. Perceptions of lakes and storm water management

Issues	Response options	Response (N)	%
Experience waterlogging/flooding	Rarely	34	26.2
	Occasionally	56	43.1
	Frequently	39	30
	Always	1	0.8
Lake's role in managing storm water	Yes	62	47.7
	No	50	38.5
	Not sure	18	13.8
Importance of sustainable practices	Very important	101	77.7
	Somewhat important	18	13.8
	Not important	7	5.4
	Not sure	4	3.1

to addressing these problems are split; a small majority (47.7%) recognise its role in stormwater management, while a sizable portion (38.5%) disagrees, indicating that more public education is necessary regarding the hydrological significance of urban lakes. An overwhelming 77.7% of respondents consider sustainable water management practices very important, demonstrating strong public support for ecological and resilient approaches to addressing flooding and urban runoff. A strong consensus on the solution supports this pragmatic concern.

There is a noticeable division in the community's opinion of the current urban infrastructure: a slight majority (43.6%) believe it is insufficient, consistent with other concerns expressed about drainage and upkeep (Table 5). An ecological and restorative vision for urban development is clearly indicated by the response when asked to propose specific improvements. Lake restoration and conservation (42.3%) is the most popular recommendation, giving the restoration of the natural asset itself precedence above merely technical fixes like better drainage systems (33.1%). In addition, a notable desire for more green spaces and urban parks (23.1%) suggests that people would much rather invest in nature-based solutions that improve community well-being and environmental health than merely upgrade traditional infrastructure.

A significant minority (28.5%) indicate a negative impact, despite the majority of respondents (41.5%) believing urbanisation had a beneficial impact (Table 6). This suggests that experiences vary throughout the community. The virtually identical split on whether development projects successfully incorporate stormwater management - 46.9% agreeing and 41.5% disagreeing - further highlights this ambiguity. This lack of agreement implies that the advantages of urban development for drainage are not universally recognised or adequately conveyed, indicating significant variation in planning outcomes and the urgent need for future urban projects to incorporate sustainable stormwater principles more consistently and transparently.

DISCUSSION

The Bogadhi Lake's pollution and encroachment profile closely resembles the degradation patterns noted for other urban lakes in Karnataka. While Ravindra et al. (2021) specifically linked the decline of Mysuru's lakes to land-use change, sewage inflow, and the lack of coordinated institutional responses,

Table 5. Infrastructure and urban planning

Planning issues	Response options	Response (N)	%
Adequacy of infrastructure	Yes	51	39.2
	No	45	43.6
	Not sure	34	26.2
Suggested improvements	Better drainage systems	43	33.1
	Lake restoration and conservation	55	42.3
	Green spaces and urban parks	30	23.1
	Community awareness and engagement	2	1.5

Table 6. Impact of urbanization on stormwater management

Status of impact	Response options	Response (N)	%
Impact of urbanization on drainage	Positive impact	54	41.5
	Negative impact	37	28.5
	No impact	27	20.8
	Not sure	12	9.2
Development projects consider storm water effectively	Yes	61	46.9
	No	54	41.5
	Not sure	15	11.5

Ramachandra et al. (2018) found that unplanned peripheral development and solid waste dumping were the main drivers of wetland deterioration in Bangalore. By capturing community perception, the current study confirms these findings but goes in a significant new direction: it shows that the effects of encroachment, such as decreased storm water capacity and declining water quality, are now experientially visible to non-technical residents, indicating that degradation has crossed a threshold of social recognition. This directly affects policy since political support for enforcing anti-encroachment laws can be mobilized more effectively through apparent degradation than through abstract technical indicators alone.

The study's most theoretically relevant finding is the co-existence of high community awareness and low active involvement. In a similar South Indian setting, Krishnan et al. (2019) showed that community-driven lake conservation only produces long-lasting results when formal participation mechanisms are purposefully built; awareness does not immediately convert into action without them. This supports Ostrom's (2009) claim that institutional scaffolding is necessary for social-ecological systems in order to transform collective concern into coordinated governance. At Bogadhi Lake, 62.3% of respondents said they would be willing to help with restoration, while 66.9% said they would only occasionally become involved. This discrepancy can be attributed to the lack of organized avenues for participation rather than apathy.

The practical implication is that in order to institutionalize the latent civic capital already present in the local community, formal co-management mechanisms, such as a Lake Stewardship Committee with defined roles in monitoring and reporting, should take precedence over additional funding for awareness campaigns, which locals already believe are insufficient. The integrated urban water management approaches promoted by Capodaglio et al. (2016) and Fletcher et al. (2015), who demonstrated that nature-based and low-impact development strategies outperform conventional drainage in long-term performance, are generally consistent with community preferences for infrastructure solutions, particularly stormwater treatment plants (43.1%) and improved drainage (36.2%). The nearly unanimous support (89.2%) for striking a balance between development and ecological integrity is also consistent with the blue-green infrastructure values reported by Singh et al. (2021) and Kumar and Shah (2019). Residents' reported experiences of frequent waterlogging (73.1%) and their perception that flood prevention is adequate (63.8%) show a notable contradiction. This discrepancy is consistent with Giacomoni and Zechman's (2011) finding that community perceptions of flood risk tend to lag behind quantifiable hydrological vulnerability (Henny and Meutia 2013) emphasizing the necessity of focused public education regarding the lake's function as a storm water retention system to ensure that community support for encroachment limits is based on a precise comprehension of the hydrological effects of lakeside development (Ishiwatari 2019, Irfeey et al. 2023).

This study's wider policy implication is that without concurrent institutional reform, Bogadhi Lake's physical restoration efforts will not produce long-lasting results. Successful city-level interventions necessitate integrating infrastructure with accountability systems and true stakeholder co-production, as Koop et al. (2022) concluded from a global assessment of urban water governance. The perception of inadequate interdepartmental coordination and the finding that 50.8% of respondents think the city government has not allocated enough resources indicate that additional funding through the current governance structures will be insufficient in the absence of structural reform. The institutional framework required incorporating technical interventions, community co-management, and long-term monitoring within the planning cycles of the AMRUT program would be provided by establishing a specialized, multi-departmental lake management authority with mandatory community representation. This model has been shown to be successful in other Indian urban lake contexts by Mahanta et al. (2020). In order to bolster the evidentiary base for investment prioritization, future research should supplement this perceptual baseline with hydrological modelling and direct water quality measurements (Canteiro et al. 2024).

CONCLUSIONS

The study concludes that the crisis at Bogadhi Lake is as much a failure of governance as it is an environmental issue. The analysis of 130 core stakeholders confirms that the lake is a critical but failing component of the local hydrological system, burdened by pollution, primarily construction debris and land-use changes that exacerbate waterlogging. Despite systemic institutional neglect, there is a clear community mandate for a sustainable restoration model that balances ecological health with passive recreation, such as walking paths and wildlife observation.

The primary contribution of this research is a community-validated roadmap for urban planners. We recommend transitioning from top-down management to a participatory Lake Stewardship Committee to bridge the identified trust gap. Immediate actions must prioritise enforcement of anti-encroachment laws and the implementation of nature-based solutions such as riparian restoration and drainage nets. While limited by its cross-sectional design, this study provides an empirical baseline for future technical water-quality monitoring and hydrological modelling. Ultimately, the preservation of Bogadhi Lake for future generations depends on leveraging civic capital through multi-stakeholder collaboration and transparent governance.

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REFERENCES

Anh, N. T., Nhan, N. T., Schmalz, B. and Le Luu, T. 2023. Influences of key factors on river water quality in urban and rural areas: A review. Case Studies in Chemical and Environmental Engineering, 8, 100424. https://doi.org/10.1016/j.cscee.2023.100424

Auddy, N., Rai, A., Shrimali, A., Pobi, K., Dutta, S. and Nayek, S. 2022. Assessing influence of anthropogenic and environmental factors on surface water quality for sustainable management of urban lakes: A case study from Udaipur, India". Water practice and technology. https://doi.org/10.2166/wpt.2022.078

Canteiro, M., Cotler, H., Mazari-Hiriart, M., Babinet, N. and Maass, M. 2024. Natural dynamics and watershed approach incorporation in urban water management: A scoping review. PLoS ONE. https://doi.org/10.1371/journal.pone.0309239

Capodaglio, A.G Ghilardi, Paolo, and Boguniewicz-Zabocka, Joanna. 2016. New paradigms in urban water management for conservation and sustainability. Water Practice and Technology, 11(1), 176-186. https://doi.org/10.2166/wpt.2016.022

Costadone, L. and Sytsma, M. 2022. Identification and characterization of urban lakes across the continental United States. Lake and Reservoir Management, 38(2), 126-138. https://doi.org/10.1080/10402381.2021.2022044

Daigger, G., Sharvelle, S., Arabi, M. and Love, N. 2019. Progress and promise transitioning to the one water/resource recovery integrated urban water management systems. Journal of Environmental Engineering, 145(10), 1552. https://doi.org/10.1061/(ASCE)EE.1943-7870.0001552

Fletcher, T.D., Shuster, W., Hunt, W.F., Ashley, R., Butler, D., Arthur, S., Trowsdale, S., Barraud, S., Semadeni-Davies, A., Bertrand-Krajewski, J-L., Mikkelsen, P.S., Rivard, G., Uhl, M., Dagenais, D. and Viklander, M. 2015. SUDS, LID, BMPs, WSUD and more – The evolution and application of terminology surrounding urban drainage. Urban Water Journal, 12(7), 525-542. https://doi.org/10.1080/1573062X.2014.916314

Giacomoni, M.H. and Zechman, E.M. 2011. Assessing sustainability of integrated urban water resources systems through a complex adaptive systems approach. Pp. 2844-2851. In: Beighley, R.E. and Killgore, M.W. (Eds.), Proceedings of World Environmental and Water Resources Congress 2011: Bearing Knowledge for Sustainability. American Society of Civil Engineers, California, USA. https://doi.org/10.1061/41173(414)297

Gowda, K. and Sridhara, M.V. 2013. Environmental management of urban lakes: The case of Mysore, India. Institute of Town Planners, India Journal, 10(4), 1- 19. https://www.itpi.org.in/uploads/journalfiles/oct_13.pdf

Henny, C. and Meutia, A.A. 2013. Urban lakes in megacity Jakarta: Risk and management plan for future sustainability. Procedia Environmental Sciences, 20, 734-746. https://doi.org/10.1016/j.proenv.2014.03.088

Irfeey, A.M.M., Alotaibi, B.A., Najim, M. and Shah, A.A. 2023. Water valuation in urban settings for sustainable water management. Water, 15(17), 3105. https://doi.org/10.3390/w15173105

Ishiwatari, M. 2019. Flood risk governance: Establishing collaborative mechanism for integrated approach. Progress in Disaster Science, 2, 100014. https://doi.org/10.1016/j.pdisas.2019.100014

Koop, S., Grison, C., Eisenreich, S.J., Hofman, J. and van Leeuwen, K. 2022. Integrated water resources management in cities in the world: Global solutions. Sustainable Cities and Society, 86, 104137. https://doi.org/10.1016/j.scs.2022.104137

Krishnan, V., Raj, K. and Rao, P. 2019. Participatory approaches in lake management: A case study from South

India. Journal of Water and Climate Change, 10(3), 520-532. https://doi.org/10.2166/wcc.2019.043

Kumar, R. and Shah, T. 2019. Urban lakes and their ecosystem services: Challenges and opportunities. Environmental Management Journal, 23(4), 455-468. https://doi.org/10.1016/emj.2019.04.005

Lin, S., Shen, S., Zhou, A. and Lyu, H. 2021. Assessment and management of lake eutrophication: A case study in Lake Erhai, China. The Science of the Total Environment, 751, 141618. https://doi.org/10.1016/j.scitotenv.2020.141618

Mahanta, N., Samuel, A. and Rajput, B. 2020. Community participation and bio rights possibilities in the conservation of urban wetlands: A study of Deepor Beel (Lake), Guwahati, India. pp. 1367-1372. In: 8th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions) (ICRITO), Noida, India, 2020, https://doi.org/10.1109/ICRITO48877.2020.9197997

Nair, S. and Krishnan, S. 2018. Ecological engineering approaches for urban lake restoration in India. Journal of Environmental Management, 217, 536-545. https://doi.org/10.1016/j.jenvman.2018.03.095

Ostrom, E. 2009. A general framework for analyzing sustainability of social-ecological systems. Science, 325(5939), 419-422. https://doi.org/10.1126/science.1172133

Ramachandra, T.V., Bharath, H.A. and Aithal, B.H. 2018. Environmental degradation of urban wetlands: A case study of Bangalore. Environmental Monitoring and Assessment, 190(7), 416. https://doi.org/10.1007/s10661-018-6806-z

Ravindra, B., Manjunatha, M. and Shashidhar, S. 2021. Assessment of water quality and pollution sources of urban lakes in Mysore, India. International Journal of Environmental Science, 16(2), 122-134. https://doi.org/10.1007/s11356-021-12415-7

Sharma, A., Hamlet, A.F., Fernando, H.J.S., Catlett, C.E., Horton, D.E., Kotamarthi, V.R., Kristovich, D.A.R., Packman, A.I., Tank, J.L. and Wuebbles, D.J. 2018. The need for an integrated land-lake-atmosphere modeling system, exemplified by North America's Great Lakes Region. Earth's Future, 6(10), 1366-1379. https://doi.org/10.1029/2018EF000870

Singh, A., Gupta, S. and Tiwari, R. 2021. Urbanization and its impact on surface water bodies: A spatial analysis. Sustainable Cities and Society, 68, 102778. https://doi.org/10.1016/j.scs.2021.102778

Singh, D.K. and Singh, N. 2019. Drying Urban lakes: A consequence of climate change, urbanization or other anthropogenic causes? An insight from northern India. Lakes & Reservoirs: Science, Policy and Management for Sustainable Use, 24(2), 115-126. https://doi.org/10.1111/lre.12262

Vidya, V.K., Putty, M.R.Y. and Manjunath, K. 2015. Urban tanks for facilitating reuse of municipal sewage: A case study in Mysuru, Karnataka. Aquatic Procedia, 4, 1508-1513. https://doi.org/10.1016/j.aqpro.2015.02.195

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