



Community-Prioritized Barriers to Sustainable Development for Dal Lake, Srinagar: Evidence from a Garrett Ranking Analysis

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Abstract

Sustainable community development around ecologically sensitive regions require an understanding of the socioeconomic and environmental challenges faced by residents. This study examines the major problems perceived by households in the Dal Lake region of Srinagar, Jammu & Kashmir. A structured survey of 372 households was conducted to evaluate and rank the prevailing issues affecting community well-being. The Garrett Ranking Technique was employed to convert respondent's ordinal rankings into quantitative mean scores, enabling statistically grounded prioritization. Findings reveal that poor waste management systems, sanitation issues, and waterborne diseases represent the most severe problems, followed by general health challenges and economic instability, while inadequate access to education ranks lowest in severity. These results highlight how interlinked ecological deterioration and public service gaps affect the livelihoods and health of lakeside communities. Moreover, the findings expose a structural flaw in the Smart City development approach, which prioritizes visible urban modernization over essential human-centric services. The study contributes to sustainability literature by offering a perception-based problem hierarchy that can support policy planners, conservation authorities, and business strategy stakeholders in designing interventions aligned with SDG-3 (Good Health), SDG-6 (Clean Water and Sanitation), and SDG-11 (Sustainable Cities and Communities).

Keywords: Garrett Ranking, Dal Lake, Waste management, Smart City model, Sanitation, Sustainable livelihoods.

Received 05 Dec., 2025; Revised 10 Dec., 2025; Accepted 13 Dec., 2025 © The author(s) 2025.
Published with open access at www.questjournals.org

I. Introduction

Dal Lake, the socioeconomic and cultural landmark of Srinagar, is home to thousands of residents whose livelihoods depend directly or indirectly on its freshwater ecosystem. As a globally known tourist destination and ecological hotspot, the lake faces growing environmental stress triggered by urbanization, pollution, and climate change. These pressures impose substantial problems on lakeside residents, who depend on the lake for domestic and occupational needs. Sustainable development in such contexts requires an understanding of the relative severity of problems experienced by the community, ensuring that policy priorities reflect public need rather than external assumptions.

Despite various interventions, including the Dal Conservation Plan and the Smart City Mission, persistent challenges related to sanitation, waste management, and public health continue to affect the residential settlements around the lake. The present research captures the ecological degradation of Dal Lake and employs the Garrett Ranking Technique to determine the hierarchy of livelihood and environmental challenges among households residing in and around Dal Lake. The results are expected to serve as empirical guidance for future development and sustainability strategies.

II. Literature Review

Various Studies have consistently linked environmental decline to socioeconomic and health vulnerabilities in lake and wetland communities (Mara et al., 2010; Guerrero et al., 2013). Inadequate sanitation and waste disposal increase pathogen exposure, reduce productivity, and intensify household poverty (UNICEF

& WHO, 2021). In tourism-based ecosystems, declining water quality also threatens local economies by lowering tourist inflow and disrupting occupation patterns (Mohan & Gaikwad, 2020). However, community priorities vary across regions, indicating the need for perception-based, location-specific analyses.

Studies from Indian lakeside settlements demonstrate that planning interventions often underperform when local perceptions are not incorporated into development decisions (Khan, 2019; Ahmed & Qayoom, 2021). This research expands the discourse by statistically ranking household challenges through a Garrett score-based framework, reinforcing both the ecological and human dimensions of sustainability.

III. Theoretical Framework

3.1 Sustainable Livelihoods Framework

The Sustainable Livelihoods Framework posits that household well-being is dependent on a set of assets, human, economic, social, physical, and environmental. Any disruption to environmental or public service assets reduces overall livelihood resilience.

3.2 Community-Driven Development Perspective

This framework suggests that development interventions succeed when they respond directly to community priorities. Ranking studies therefore provide a foundation for bottom-up policy planning.

IV. Methodology

4.1 Research Design

A descriptive research design was adopted, focusing on identifying and ranking key development challenges.

4.2 Sampling and Data Collection

A sample of 372 households surrounding Dal Lake was surveyed using random sampling to ensure spatial representation of lakeside settlements. Participants ranked six predefined community problems.

4.3 Garrett Ranking Technique

The Garrett Ranking Technique was used to calculate percent positions of ranks, match them with conversion table scores, and determine mean Garrett scores for each issue. This method allows ordinal rankings to be converted into interval-type scores for statistical precision.

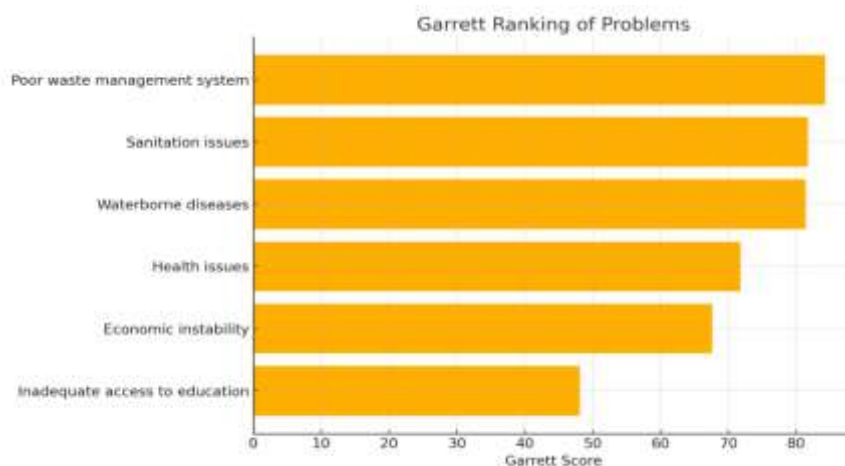
4.4 Ethical Considerations

Respondent anonymity and voluntary participation were ensured through verbal consent.

V. Results

The ranking outcomes are displayed below.

Rank	Problem	Mean Garrett Score	Severity
1	Poor waste management system	84.28	Most severe
2	Sanitation issues	81.72	Very severe
3	Waterborne diseases	81.37	Severe
4	Health issues	71.81	Moderately severe
5	Economic instability	67.61	Less severe
6	Inadequate access to education	48.12	Least severe



The results show that environmental and sanitation concerns dominate the perception profile of lakeside communities.

VI. Interpretation

The three top-ranked issues, poor waste management, sanitation deficiencies, and waterborne diseases reflect a strong ecological–health linkage. These problems represent immediate threats to household safety, particularly where families rely on lake water and live near polluted drainage channels. General health challenges and economic instability show moderate intensity, while inadequate access to education ranks lowest, which may indicate that basic educational services are comparatively stable or overshadowed by survival needs.

VII. Discussion

The findings are consistent with global evidence that environmental degradation amplifies socioeconomic vulnerability (World Bank, 2020). For Dal Lake, where tourism and fisheries play crucial economic roles, poor sanitation and unmanaged waste disposal create a circular pattern of ecosystem decline, reduced livelihood opportunities, and worsening community health. The results emphasize that improving environmental services is indispensable for restoring social and economic resilience.

VIII. Aligning Smart City Initiatives with Core Community Service Needs

Although Srinagar has been incorporated into the Smart City Mission, the core household challenges identified in this study remain largely unresolved. The findings suggest that the Smart City model, while visionary in terms of digital transformation and urban beautification, may presently place greater emphasis on visible and technology-driven upgrades compared to essential public service delivery. Urban improvements such as LED lighting, cycling tracks, waterfront redevelopment, and tourism-oriented infrastructure have received notable investment and have contributed positively to the aesthetic and recreational value of the lakefront. However, enhancements in basic community services such as household waste disposal systems, sewage connectivity, and sanitation infrastructure in residential settlement clusters—appear to have progressed more slowly.

This imbalance echoes scholarly discussions around exclusionary modernization, where rapid urban transformation sometimes benefits visitors and economically privileged groups more than long-established residents (Datta, 2018; Chatterjee, 2020). The Garrett Ranking results from this study do not negate the value of Smart City developments; rather, they highlight an opportunity to complement ongoing modernization efforts with targeted interventions addressing the most urgent community priorities—waste management, sanitation, and public health. In this way, Smart City initiatives can become more inclusive, ensuring that technological advancement and community well-being evolve hand in hand.

IX. Implications

9.1 Theoretical Implications

By applying the Garrett Ranking Technique to assess lived experience, this research emphasizes the value of perception-based quantitative approaches in unpacking development realities in ecologically sensitive settlements. The findings reinforce theories within the Sustainable Livelihoods and Community-Driven Development frameworks by showing that environmental deterioration and service gaps directly weaken household asset portfolios, particularly in terms of health, safety, and livelihood security. Moreover, the study contributes to theoretical discourse by demonstrating that modernization narratives alone do not constitute sustainability unless everyday welfare, ecological resilience, and social inclusivity form the core of planning. Thus, the work sets a foundation for future empirical studies that integrate community perspectives into urban development models.

9.2 Practical / Managerial Implications

Development agencies and conservation authorities can use the priority matrix derived from Garrett scores to allocate resources more efficiently, focusing first on the highly ranked issues of waste management and sanitation. For implementation practitioners, the results provide a clear decision-support tool to determine which interventions would yield the most immediate improvement in community well-being. Waste collection logistics, household sanitation connectivity, public health infrastructure, and lake decontamination programs represent areas where practical action will have substantial social and environmental returns. The findings also underscore the need to strengthen inter-departmental coordination among municipal bodies, Smart City units, tourism departments, and lake conservation authorities to reduce overlaps and fill service gaps. Managers can further adopt community feedback loops such as periodic perception surveys to continuously monitor whether implemented interventions align with evolving household needs.

9.3 Policy Implications

Smart City planning must be restructured to integrate community perception audits, ensuring that household welfare forms the core of urban improvement and conservation programs. Rather than viewing technological upgrades and basic service delivery as competing agendas, policymakers can position them as complementary pillars of sustainable urban transition. Incorporating community-driven issue prioritization during project formulation may help ensure that the financial and administrative attention accorded to beautification and tourism infrastructure is matched by equivalent attention to waste management, sanitation, and public health. Policies can also incorporate equity-based indicators to assess whether benefits of modernization reach long-established residents, especially those for whom livelihood and identity are tied to Dal Lake. In the long term, development policies that institutionalize participation of residents in decision-making can strengthen governance legitimacy, accelerate adoption of interventions, and ensure that urban transformation remains both inclusive and ecologically responsible.

X. Limitations

- The study focused only on households; tourism operators, business owners, and NGOs were not included.
- Only six predefined issues were examined; additional concerns may exist.
- Seasonal variations in lake pollution may alter perceptions.

XI. Future Scope

Future work could:

- Expand stakeholder representation to include commercial and institutional actors.
- Use structural equation modelling to examine causal pathways between environmental stress and socioeconomic outcomes.
- Compare Dal Lake with other Indian or global lake ecosystems to explore perception patterns.

XII. Conclusion

This study examined and prioritized the major community development challenges around Dal Lake through a quantitative Garrett Ranking framework, enabling a systematic understanding of the issues most affecting household well-being. The results emphasize that inadequate waste management, sanitation deficiencies, and waterborne diseases represent the most urgent concerns for residents, highlighting the close interconnection between ecological conditions and public health.

While Srinagar's inclusion in the Smart City Mission has brought visible improvements in urban aesthetics and modern infrastructure, the findings of this research suggest that long-term sustainability also requires sustained attention to essential household services. The study does not critique Smart City developments in principle; rather, it identifies an opportunity to strengthen them further by integrating community-defined priorities particularly those related to waste management, sanitation, and household health into ongoing and future initiatives. In doing so, Smart City interventions can evolve in a way that balances modernization with inclusive welfare.

Overall, the research advocates for community-driven sustainability planning focused on ecological restoration, improved sanitation infrastructure, and livelihood support for lakeside households. Such an integrated approach can simultaneously protect the fragile Dal Lake ecosystem and enhance the quality of life of its resident population, contributing meaningfully to broader sustainable development goals.

Acknowledgment

The authors express their sincere gratitude to the Indian Council of Social Science Research (ICSSR) for generously funding the project titled "A Social Science-Based Study to Investigate the Role of Community Engagement and Its Drivers in the Conservation of Dal Lake in Kashmir." The present paper is derived from the findings of this funded study.

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