

## The Pukhus of Kathmandu Valley: Exploring traditional ponds through the lens of Biophilic Urbanism

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### INTRODUCTION & AIM

Biophilic Urbanism is a design approach that prioritises the human–nature relationship by integrating nature into the urban environment (Cook, 2016). Among many natural features, water is one of the most essential components of biophilic design, offering significant potential to strengthen this relationship. Research suggests that urban landscapes with water or blue space are more restorative and preferred by people compared to those without (Browning et al., 2014). Water elements that support Biophilic Urbanism range from natural features—such as rivers, lakes, and oceans—to designed interventions, including ponds, fountains, and water spouts.

Kathmandu Valley has a rich history of urban water architecture. Its traditional towns demonstrate a strong integration of water elements in their planning and design, contributing to the vitality of urban public spaces (Chitrakar, 2020). A variety of water elements—including conduits and canals, ponds, water spouts, and wells—can be found distributed throughout the towns to supply water not only for everyday practical use but also to support diverse socio-cultural and religious practices (Tiwari, 2023). The integration of water bodies—particularly ponds—thus hints at a distinctive pre-modern illustration of Biophilic Urbanism, because of their capacity to embed natural processes within everyday urban life while preserving water as both a sensory and functional element (Kellert & Calabrese, 2015). These ponds (*pukhu* or *pokhari* in the local languages) are not merely incidental landscape features, but rather integral components of a broader hydrological and ecological system that structured settlement patterns and public space networks (Tiwari, 2023; Joshi, 2025). This study examines the traditional ponds of the valley through the lens of biophilic urbanism. By analysing their provision, use, and management, it seeks to demonstrate how these water bodies embody the principles of Biophilic Urbanism through the integration of ecological processes, sensory experiences, and socio-cultural and religious practices within the process of city building.

### METHOD

This study employs a case study approach to examine traditional ponds in the Kathmandu Valley. Joshi (2025) suggests that the valley's ponds can be classified into three types based on their locations and hydrological functions related to the water management system: a) upstream ponds; b) ponds inside settlements; and c) downstream ponds (figure 1). We have, therefore, selected three ponds representing each type that belong to three principal towns, namely Kathmandu, Lalitpur, and Bhaktapur (figure 2 and 3).

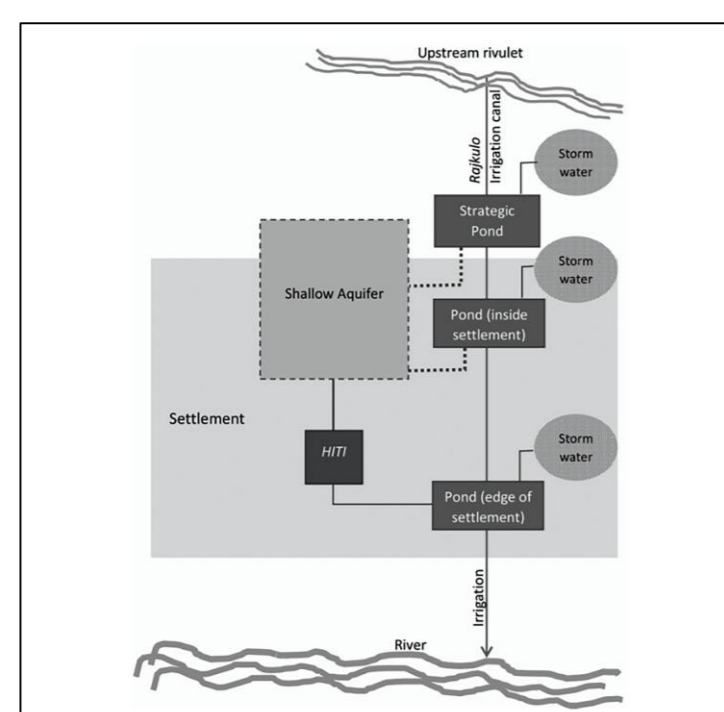


Figure 1: Diagram illustrating water management system and the location and types of ponds (Source: Joshi, 2025)

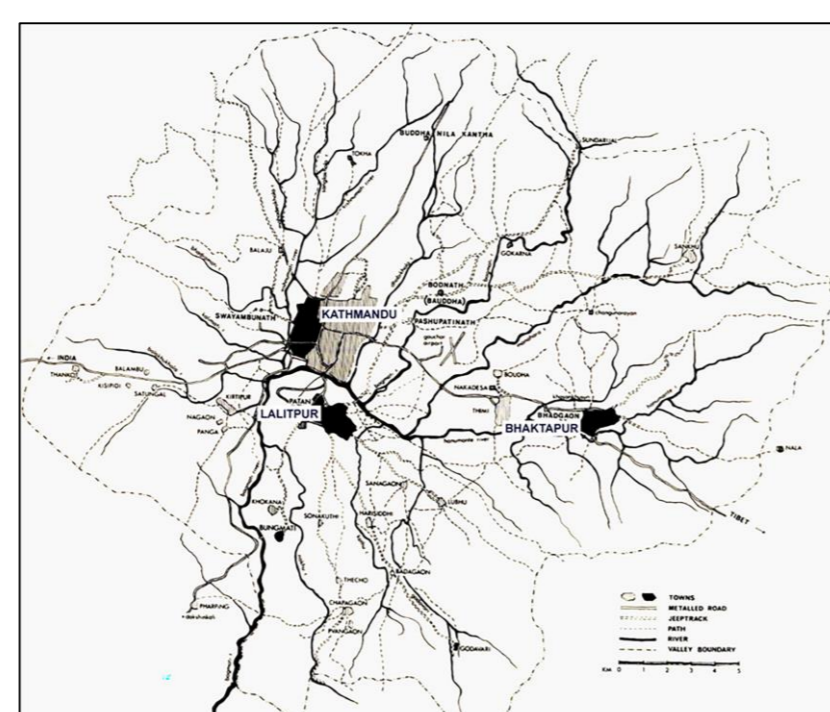


Figure 2: Map of the Kathmandu Valley showing the three principal traditional towns (Source: Hosken, 1974)



Figure 3: From left to right – Rani Pokhari (Upstream pond, Kathmandu), Pimbahal Pokhari (Inside settlement pond, Lalitpur), and Byasi Pokhari (Downstream pond, Bhaktapur) (Source: Authors and onlinekhabar.com)

We used direct observations of the selected ponds and the activities associated with them to collect primary data. Data were also gathered from secondary sources by referring to historical documents and government records, websites, media outlets, and academic and professional literature.

### RESULTS & DISCUSSION

Depending on their locations, the traditional ponds perform several hydrological and ecological functions. For instance, upstream ponds are large buffer reservoirs located at higher elevations that collect the rain and storm water preventing flooding in the settlement. Ponds inside settlements gather storm water and recharge local aquifers. Downstream ponds collect the dirty water that has passed through human activity zones and are usually located near open defecation areas, with the role of controlling floods and landslides in the low-lying areas. To achieve these functions, the ponds had to be distributed across the settlement. While doing so, these ponds—particularly the ones inside the settlement—were strategically placed within residential neighbourhoods, urban nodes, and temple complexes of the towns to function as a multipurpose urban amenity. This has allowed residents to interact with water regularly as it becomes highly visible and accessible across urban spaces in the form of ponds.

Apparently, water retention might be the main idea behind building these ponds to contribute to the water management system. Yet the findings suggest that there are implications beyond this in terms of biophilic design and socio-cultural significance. The ponds add to how humans can connect with nature through its direct experience. Our observations show that all three ponds contribute to this with their reflective qualities and dynamic movement of water to collectively generate rich sensory environments that foster emotional and psychological connections with nature. In these ponds, architectural elements, such as shrines and pavilions, heavily rely on the use of materials that reflect earth tones and natural colours, including timber, stone, brick, and tiles to foster the indirect experience of nature. Moreover, the concept of 'prospect and refuge' has been brilliantly adapted by the ponds, which has made them psychologically appealing to the people. These ponds provide expansive aesthetic views, contributing to the sense of openness within a dense urban fabric, whereas *Phalchas* and *Mandapas* (public rest houses) provide a sense of enclosure and security, creating an environment highly conducive for social interaction and relaxation. Pimbahal Pokhari in Lalitpur is an excellent example of an inside settlement pond that still continues to be an actively used community open space developed around a water body. The biophilic design of these ponds is, thus, a testimony to how natural and built environments can co-exist to enhance human well-being and experience.

Findings further show that these ponds are deeply connected to the socio-cultural and religious practices of the people. Historically, ponds have supported rituals, festivals, and everyday communal activities, with practices such as periodic cleaning, offerings to water deities, and community gatherings reinforcing a shared sense of responsibility. These engagements contribute to the long-term maintenance and ecological continuity of water infrastructures, including ponds. The convergence of cultural meaning and environmental function reflects the socio-ecological nature of biophilic systems and demonstrates a form of 'ecological intelligence' rooted in community practice.

### CONCLUSION

This study examines the traditional ponds of the Kathmandu Valley through the lens of biophilic urbanism, revealing their dual role as ecological assets and culturally embedded infrastructures. While embodying key biophilic design principles, these ponds are deeply intertwined with socio-cultural and religious practices. Despite increasing pressures from rapid urbanisation, their continued preservation and maintenance remain essential to sustaining their ecological functions and cultural significance. The findings offer valuable insights for advancing nature-based approaches to water management and public space design in rapidly urbanising contexts.

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