

ECONOMIC IMPACT OF RESTORATION OF HISTORIC POND IN BHAKTAPUR - A CASE STUDY OF BHAJU PUKHU

Eurika Rajbanshi^{1*}, Sushamna Shrestha¹, Neeru Shilpakar², Aashish Lageju¹

¹ Technical Section, Khwopa Engineering College, Nepal

² Technical Section, Khwopa College of Engineering, Nepal

Abstract

Bhaktapur, a city with several UNESCO World heritage sites, is known for its rich cultural legacy, traditional architecture and water management system, which include multiple medieval ponds. These historical ponds, which were originally essential to the city's ancient water system and cultural life has been neglected, polluted and encroached upon for decades. Recent restoration projects seek to restore its historical relevance, enhance community well-being, and contribute to sustainable urban development. This study focuses on urban implications of culturally significant pond in Bhaktapur, with particular emphasis on Bhaju Pukhu to better understand the economic impact of such projects. The restoration of historical ponds not only preserves cultural heritage but also provides tangible economic benefits to the neighbourhood. This case study explores the financial implications of restoring Bhaju Pukhu, a centuries-old pond in Bhaktapur, Nepal. The study finds that the project has made a considerable contribution to the local economy through field surveys, interviews with local stakeholders, and analysis of tourism and business activity before and after restoration. Key findings include increased number of visitors, growth in local business such as tea shops, fast food, local vendors, and higher property values in the surrounding area. Furthermore, the restored pond has become a place for cultural events and festivals, resulting in increased economic activity. Employment opportunities were created during and after the restoration process. The study indicates that heritage pond restoration, when carefully planned and supported by the community, can serve as a driver for long-term economic development in historic cities such as Bhaktapur.

Keywords: Impact; Revitalization of Ponds; Community; Sustainable

1. Introduction

Bhaktapur, an ancient Newar town in the eastern part of the Kathmandu Valley, holds a rich cultural heritage where ponds play a crucial role in the traditional water system. The degradation of these ponds has been a significant factor in the drying up of traditional hitis and wells. Historical ponds hold a noteworthy importance in the urban architecture of traditional Newar towns, where they are carefully integrated into the water landscape. They not only enhance the beauty of the neighborhood but also provide open spaces in the densely clustered community settings. Beyond their aesthetic appeal, these water bodies carry economic, cultural, and ecological value within the local environment.

This paper focuses solely on the economic aspect of Bhaju Pukhu which was reduced to an abandoned open field before restoration began in 2074 B.S. under the initiative of Bhaktapur Municipality. The Heritage Section of the municipality themselves were involved in the design with additional technical support from KhEC/KhCE undertaken by the municipality. Bhaju Pukhu is considered to be constructed in the 12th century and it had a Shikhara temple dedicated to Jaleswor at the centre, which was damaged in 1681 earthquake (P. Shrestha, 2019) and remained forgotten as a mysterious mound at the center. The pond water was later dried up due to leakage and destruction of 'rajkulo'. It is surrounded by mixed residential houses in the North, East and West, while the Bhaktapur Multiple Campus is located to the South. Siddha Pokhari, one of the famous landmarks of Bhaktapur (Figure 1), lies to the north across the road. Over the years, the dried up Bhaju Pukhu has been used to host picnics, sports days

*Corresponding author: Eurika Rajbanshi
Technical Section, Khwopa Engineering College, Nepal
Email: eurika.rajbanshi9841@gmail.com
<https://doi.org/10.3126/jsce.v13i1.89511>

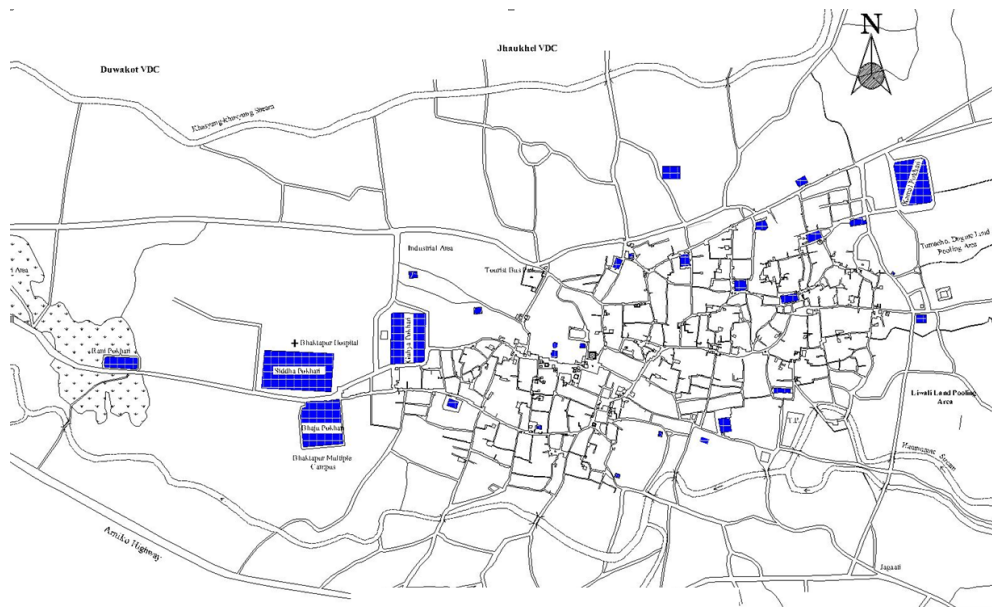


Figure 1. Map of Bhaktapur

and even served as an emergency evacuation space after the 2015 earthquake destroyed the settlements in Bhaktapur.

The revitalization of Bhaju Pukhu started as a cleaning campaign by the municipality by mobilizing local volunteers back in 2001 A.D. during which some of the archeological remains of the temple were discovered. As this pertained to archeological excavation of a heritage site, permission from DoA was obtained by the municipality for further excavation works (S. Shrestha, 2021). Not long after, the project was abandoned with the discovered artifacts being stored in a nearby shed, when the country experienced political unrest and changes. The lack of local elections from 2002 to 2017 hampered the ability of local governments to work with and provide oversight over users committees. Thus, after local elections, Bhaju Pukhu reconstruction was again initiated in 2017 as a municipal level project as a continuity of the previously disrupted work (ibid). This research aims to focus on the pond's present condition after restoration and its impact on the community.

2. Research Questions

- What is the current situation of the site areas after the restoration of Ponds?
- What economic impact has the restoration of ponds had on their respective communities?
- How has revival process addressed economic aspects for local residents?

3. Research Objectives

- To study the economic impact of the pond restoration on the community.
- To explore the relationship between the restoration of the pond and its impact on community.
- To recommend strategies for achieving a sustainable pond.

4. Methodology

A mixed-methods approach was adopted to investigate the reconstruction and usage of ponds in Bhaktapur. Primary data were obtained through site visits, direct observations, mapping, surveys, and photographic documentation. These visits enabled detailed visual assessments of the ponds and their surroundings, while structured questionnaires were administered to residents and commercial establishments to gather information on usage patterns, economic activities such as vending, tourism, and cultural events, and community perceptions of reconstruction and its impact on livelihoods. Interviews were conducted with local authorities, tourists, and community members to provide further insights into governance, cultural practices, and everyday experiences. Secondary data were collected from institutional records, including documents from Bhaktapur Municipality, Ward offices, and the Land Survey Office. Published sources such as books, journals, media reports, maps, and statistical records were reviewed, along with archival materials and prior studies on similar issues, to validate and

contextualize the primary findings. Analytical techniques included spatial mapping to trace changes in land use and pond surroundings, comparative assessments of usage patterns before and after reconstruction, and triangulation of survey, interview, and secondary data to ensure reliability. This comprehensive methodology facilitated a holistic understanding of the research area and enabled the identification of diverse concerns related to cultural heritage, community engagement, and economic activity.

5. Case Studies

Case studies were conducted in Duipokhari of Thimi, Kamalpokhari of Kathmandu, Pimbahal of Patan, and Thara Pukhu of Banepa, with data collected through surveys of ward offices, visitors, and guards, alongside activity mapping across different times of day and week. The findings reveal that pond renovation has directly stimulated local economies by increasing property values, rental rates, and commercial activity around the sites. In Duipokhari, the renovation led to higher values for homes and shutters facing the pond, while tea shops and cafés transformed the neighborhood into a vibrant business district. Similarly, in Pimbahal, revitalization boosted rental rates and land values, while boating, tea stalls, and vendor activities created a lively commercial hub. Parking management through tendered contracts and revenue-sharing further contributed to local economic structures, with the Pond Conservation Committee reinvesting collected fees into maintenance and programming. Kamalpokhari demonstrates how revitalization can attract diverse economic opportunities, including cultural industries. A daily fee is charged for film song shoots, generating revenue for maintenance, while corporate social responsibility initiatives, such as Marriott Hotel's playground project, add value to the area. Rising rental and real estate prices reflect the growing demand, though parking challenges remain, with future plans for a large facility to accommodate increased visitors. In Thara Pukhu, reconstruction has spurred foot traffic, particularly among younger visitors, leading to the emergence of small shops, snack stalls, and street vendors. Existing businesses, including hotels and eateries, have benefited from the surge in activity, transforming the pond into a thriving commercial zone. Overall, the revitalization of these ponds demonstrates the strong link between heritage conservation and economic development. Increased tourism, enhanced property values, and the growth of local commerce highlight how cultural infrastructure can serve as a catalyst for sustainable livelihoods and community prosperity.

6. Analysis and Discussion

The buildings surrounding the pond (Figure 2 and 3) were studied and categorized based on the types of rented

spaces and their respective uses. The rented spaces were primarily classified into categories such as commercial, residential etc. This analysis helped to understand the spatial organization, economic activities and land use pattern around pond area.

The site survey results indicated the areas potential as a local economic core, especially during events and tourist visits, as commercial and food related spaces predominate around the pond. Ponds feels more secure because of the constant human presence and covert surveillance by the residential and mixed use buildings. Furthermore, this classification provides useful information about how the built environment in the area promotes cultural activities as well as livelihood options.

The dataset consists of 18 commercial establishments surrounding the study area, with establishment years ranging from 2059 B.S. to 2082 B.S. The analysis of this timeline (Figure 4) demonstrates distinct patterns of commercial expansion, economic shifts, and the evolution of local business. Most recent establishments such as Drip Cafe (2082) and Sandar Everest Momo (2082) show continuous investment in fast food and cafe culture, suggesting that youth-oriented and tourist-oriented businesses remain the dominant emerging trend. Three Guest houses were listed during questionnaire survey reflecting growing demand for short term lodging, connected to increasing domestic tourism, student mobility, cultural events and local urban activities.

The findings from surveys, interviews and observations indicate that the pond's restoration has transformed the area from a neglected space into a vibrant heritage and economic node. The reconstruction of Bhaju Pukhu has reactivated its role as a cultural and economic node within Bhaktapur's urban landscape. The bar graphs collectively reveal how age-based behavioral patterns, temporal preferences, spending habits, and mobility choices contribute to the site's evolving economic footprint. The data from the bar graphs have been analysed under the following categories:

Demographic Engagement and Temporal Patterns: The 18–30 and 31–45 age groups consistently emerge as the most engaged demographics, dominating both visitor counts and preferred time slots (Figure 5). Evening visits are most common among these groups, as shown in the "Preferred time by age group" and "Customer flowtime by age" charts, suggesting that Bhaju Pukhu functions primarily as a twilight social space. This temporal clustering implies concentrated economic activity during post-work hours, benefiting vendors and informal businesses operating in the vicinity.

Walking is the dominant mode of travel, particularly among the 18–30 group, while older visitors rely more on public transport. This pedestrian-centric access reinforces Bhaju Pukhu's integration into Bhaktapur's walkable urban

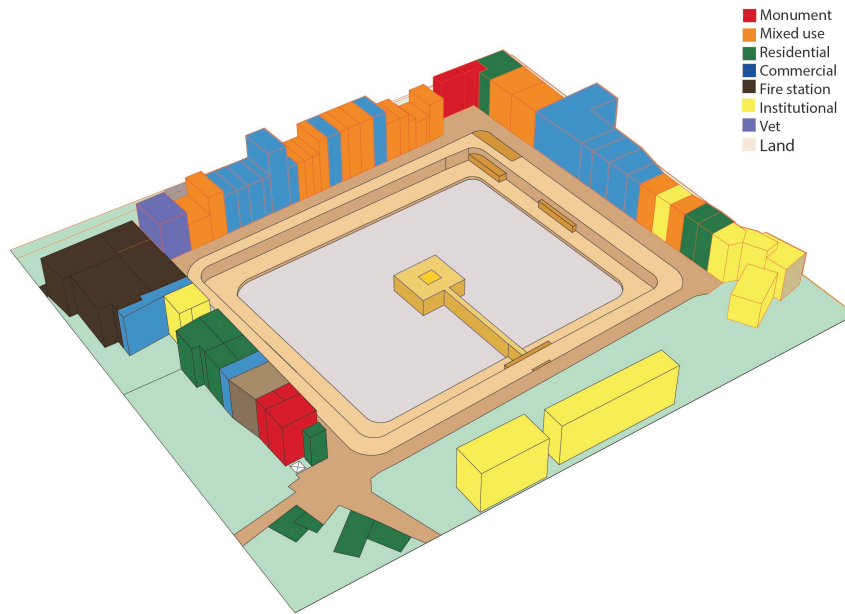


Figure 2. Building typology around the study area



Figure 3. Commercial buildings around the pond

core and suggests that economic benefits are localized, favoring small businesses within a short radius. The low reliance on private vehicles also implies reduced congestion and a more sustainable urban experience.

Visit Frequency and Duration: The “Frequency of visit” data (Figure 6) indicates that random visits far outnumber scheduled ones, especially among younger adults. This spontaneity suggests that Bhaju Pukhu’s appeal is ambient and informal, rather than programmatic. The “Time spent by people” chart (Figure 8) further supports this, showing that most visitors stay more than one hour, reinforcing the pond’s role as a destination for extended leisure and social interaction. These patterns favor businesses that thrive on unpredictable footfall—such as tea stalls, snack vendors, and

artisanal outlets.

Implications for Heritage-Led Regeneration: Bhaju Pukhu’s post-reconstruction success lies in its ability to attract spontaneous, evening-centric, pedestrian-based engagement. The site has evolved into a dynamic urban commons, where cultural heritage intersects with economic vitality. These findings offer a replicable model for heritage-led regeneration, emphasizing the importance of behavioral data in shaping inclusive, economically resilient public spaces.

Spending Behavior and Economic Impact: The “Money spent by consumer according to age” chart reveals a nuanced economic pattern. While the 18–30 group has the highest number of visitors, they also show the highest number of

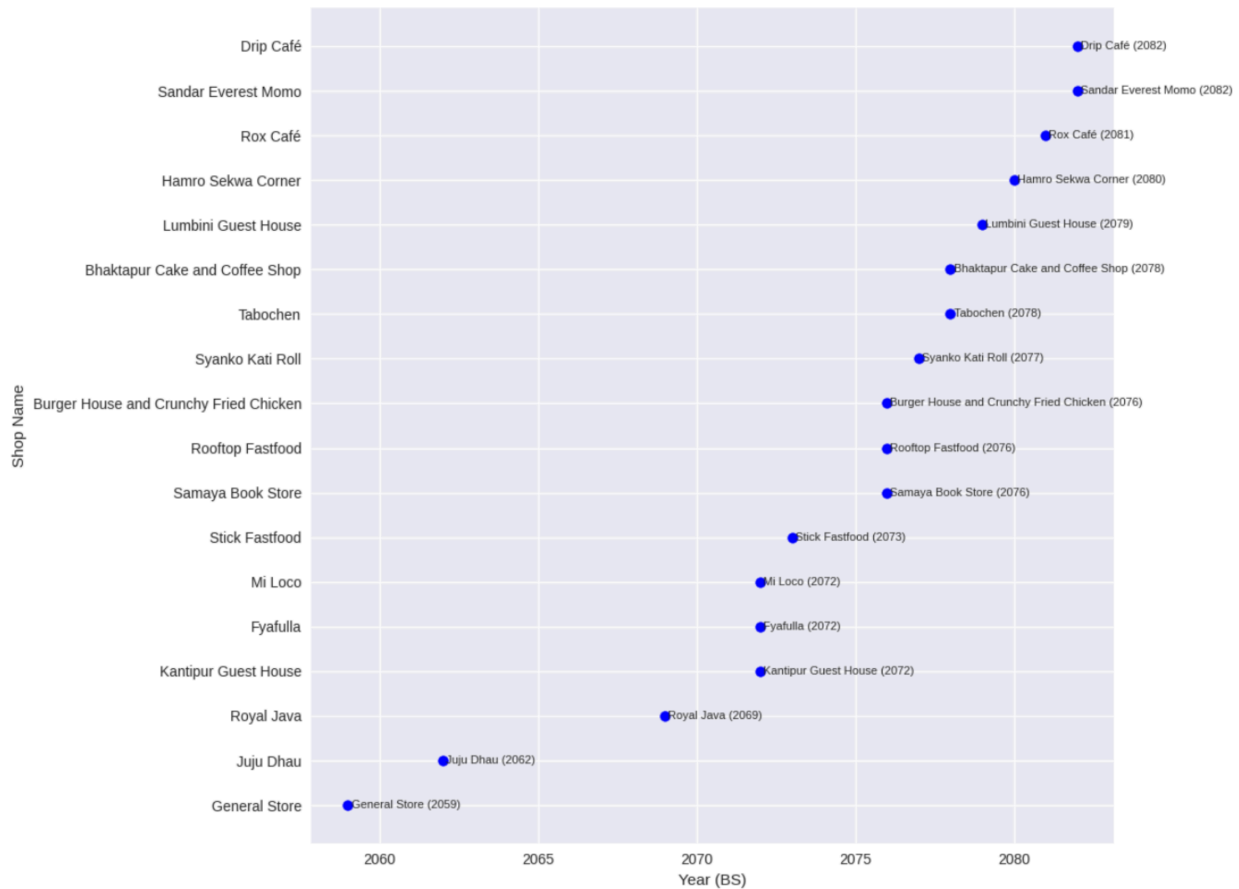


Figure 4. Timeline of shop establishment

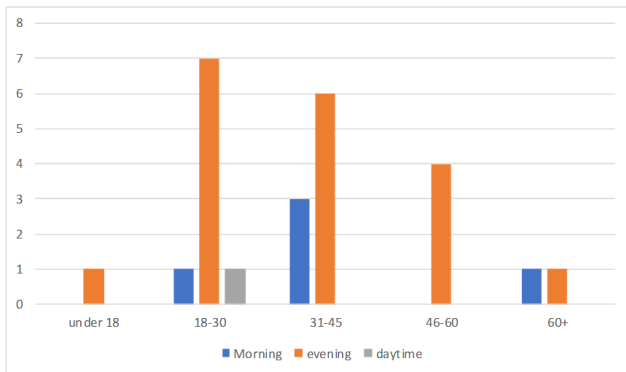


Figure 5. Preferred time by age group

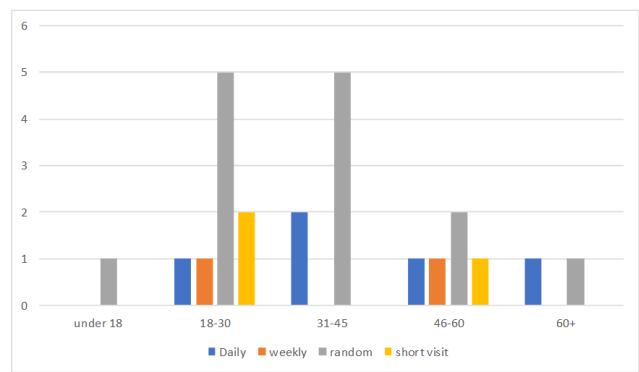


Figure 6. Frequency of visit by age group

non-spending consumers. In contrast, the 31–45 group records the most consumers spending more than NPR 500, indicating that economic gains are not solely tied to footfall but to spending capacity and intent. This suggests that middle-aged visitors may be more inclined toward cultural consumption, dining, or artisanal purchases, contributing more directly to local revenue. Inclusivity and Design Gaps: Despite the overall increase in engagement, the under-18

and 60+ groups show consistently low participation across all metrics—visit frequency, time preference, spending, and travel mode. This points to a gap in inclusive design and programming. To broaden the site’s social and economic reach, future interventions could include shaded seating, intergenerational events, and improved accessibility features tailored to youth and seniors. In addition to everyday recreational and social activities, the pond space emerges

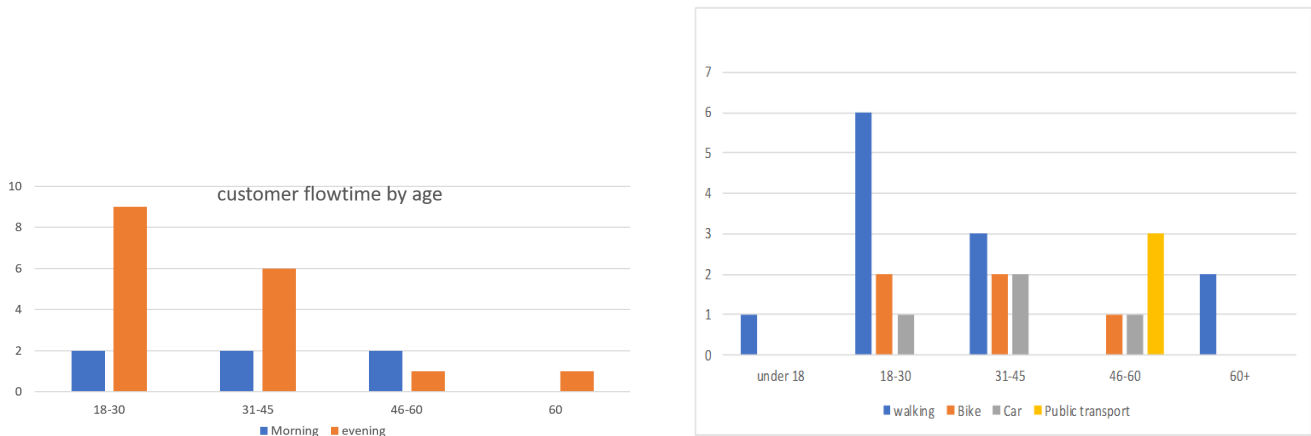


Figure 7. Customer flowtime (left), mode of travel by age group (right)

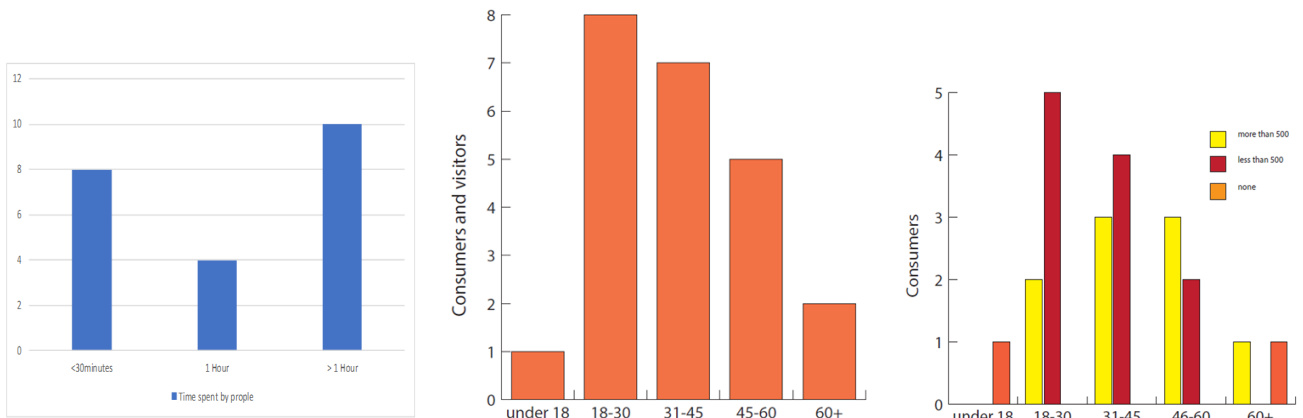


Figure 8. Time spent by people (left), age group of visitors (center), money spent by consumer acc. to age (right)

as a significant temporary economic asset during festivals and cultural events, particularly the Bhaktapur Mahotsav organized in the community. During these events, the pond surroundings are used as space for rents which directly contributes to the local economy. From an urban economic perspective, the Mahotsav based spatial renting illustrates how heritage restoration projects can evolve into self-sustaining economic nodes, generating both rental income and indirect commercial benefits. It highlights the strategic significance of ponds as multifunctional urban assets, capable of simultaneously supporting cultural identity, social gathering and economic activity.

To understand the economic impact of the pond more, Activity mapping was conducted across three time periods-morning, daytime and evening during weekdays and weekends. This method helped to identify how people use the area throughout the day, the intensity of footfall, and the types of activities that contribute to or indicate potential for local economic development. The visitor flow

patterns were observed at 7 am, 2 pm and 6 pm which helped us to identify the peak activity hours that influence the demand for services such as cafe and recreational areas. During morning time the pond area was mostly used by people for morning walks, temple visits, light exercise and casual social interaction. This indicates a stable flow of regular local visitors who contribute to the morning economy, especially tea shops. During Daytime, activity remained comparatively low, mostly limited to passers-by, students or nearby residents. During Evening, the pond area began active again as people gathered for coffee, meeting friends and leisure time. This evening footfall shows strong potential for cafe, stalls and small business to thrive (Figure 10), especially if supported with seating arrangements and proper light with safety measures. Overall, the activity mapping helped establish how different times of the day shape economic opportunities around the pond and provided a basis for recommending time sensitive improvements to strengthen local livelihood and commercial vibrancy.



Figure 9. Maintenance events by School



Figure 10. During Bhaktapur mahotsab

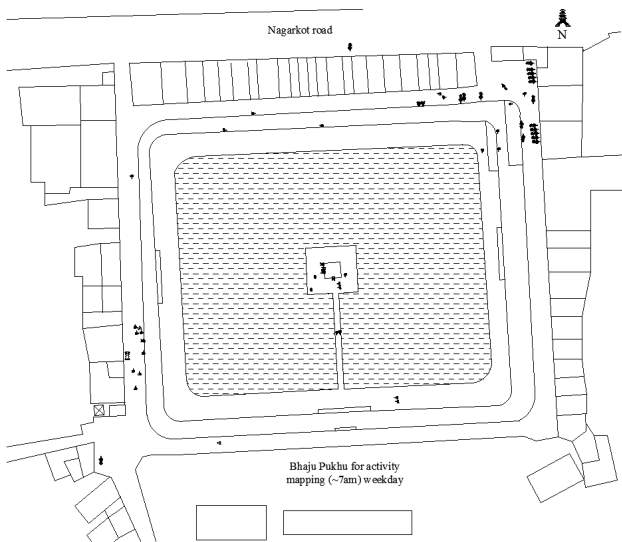


Figure 11. Activity mapping (7 am) weekday

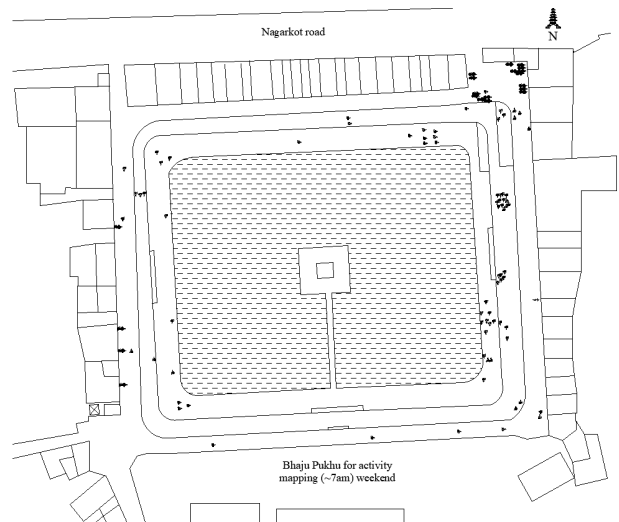


Figure 12. Activity mapping (7 am) weekend

In Bhaju Pukhu, fishing plays an important role in supporting the local economy and serves as one of the income-generating activities for Bhaktapur Municipality. Fish farming has been practiced in this pond since its early development, reflecting the community's long-standing engagement in sustainable resource use. The activity not only provides financial benefits but also helps maintain the ecological balance of the pond through regular management and harvesting. Visitors who come to Bhaju Pukhu often engage in feeding the fish, which has become a popular and interactive activity at the site. Many locals and tourists, including families and children, enjoy offering food pellets or grains to the fish as part of their visit, making it both a recreational and educational experience. In the year 2082 BS, organized fishing was conducted for first time over a span of five consecutive days—on Asar 31st and 32nd, and Shrawan 1st, 2nd, and 3rd. Prior to this event, the municipality had opened a public tender for fishing rights in

several ponds of Bhaktapur, among which Bhaju Pukhu was one of the selected sites. This process ensured transparency and fair participation of interested bidders. During the five-day fishing period, a total of 628 kilograms of fish were harvested, with daily catches of 200 kg, 210 kg, 102 kg, 65 kg, and 51 kg, respectively. The collected fish were then sold to the winning bidder at a fixed rate of NRs. 265 per kilogram. The proceeds contributed to the municipality's local revenue, while the activity itself fostered community involvement and awareness regarding the economic and environmental value of Bhaju Pukhu.

7. Conclusion

Bhaju Pukhu has been restored, bringing back its physical presence and historical significance; however, its socio-economic benefits have not yet been fully used. The restoration process has not fully turned it into a hub of social and commercial activity. The results show that the pond's

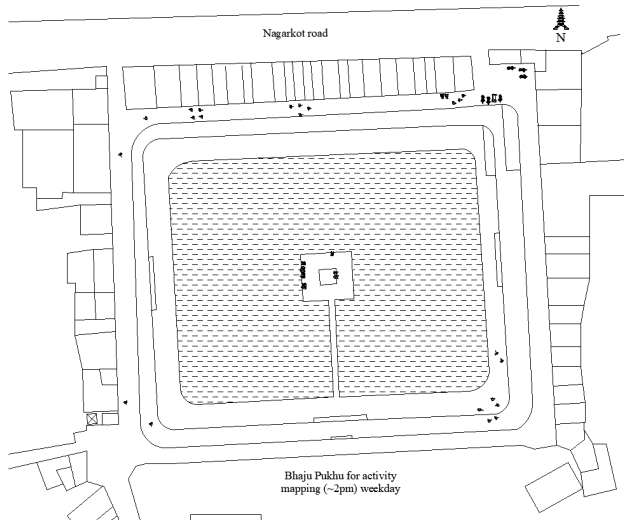


Figure 13. Activity mapping (2 pm) weekday

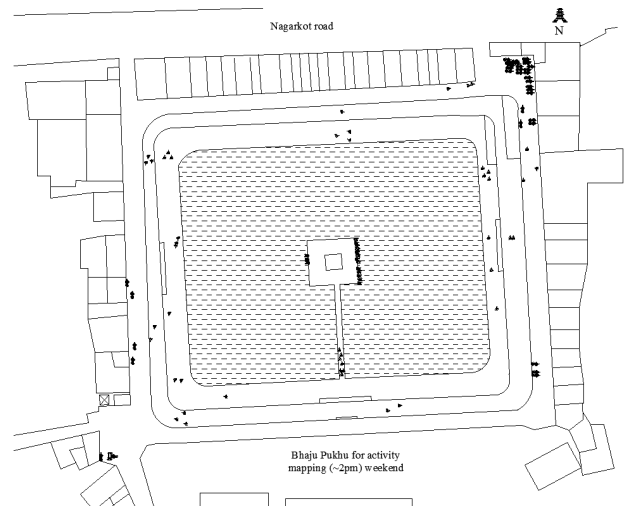


Figure 14. Activity mapping (2 pm) weekend

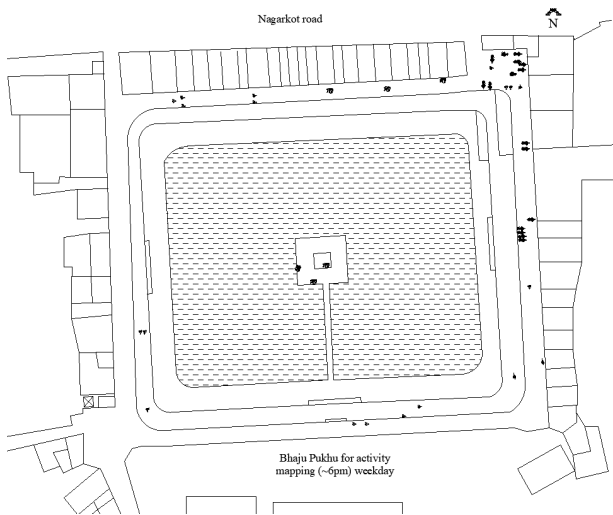


Figure 15. Activity mapping (6 pm) weekday

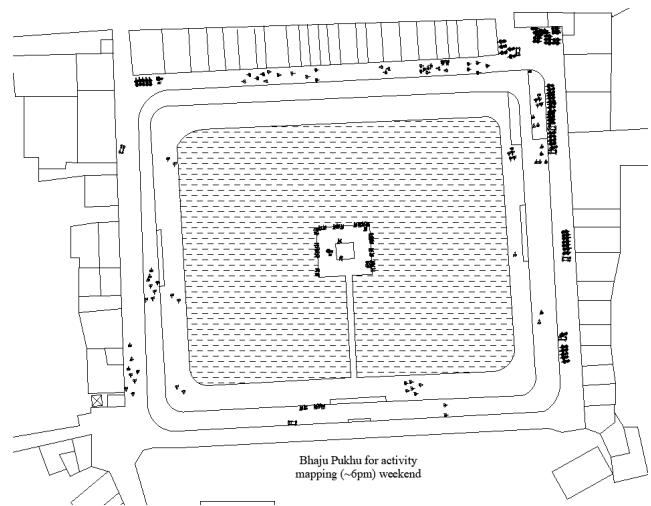


Figure 16. Activity mapping (6 pm) weekend

capacity to create economic activity for neighbourhood has been limited by the lack of closed temple, selling restrictions and leisure amenities. Additionally, inadequate public amenities such as toilets, seating areas and shaded spaces have reduced the time limit to stay for visitors. Bhaju Pukhu, however, has a great chance of developing into a long-term source of local income. The pond can be a vibrant cultural and recreational center if it is managed carefully. This can be achieved by programs like the restoration of Sanjha Aarati, restricted boating and fish feeding and the provision of Public amenities. In addition to increasing the number of visitors, such actions would boost tourism, encourage business and improve community involvement in heritage preservation. Restored ponds like Bhaju Pukhu can support long term economic resilience, community well-being and the preservation of Bhaktapur's living history through the

use of sustainable management approaches, participatory decision making, and frequent cultural programming.

8. Recommendation

The following recommendations are suggested to improve the economic and social vibrancy around the pond area, based on the field observations, stakeholder interviews and visitors feedback.

Revitalizing Religious and Cultural Activities:

The temple is currently closed, which restricts religious tourism and lowers community involvement. Regular cultural and religious events may draw more tourists, according to many locals and businessowners. It is suggested that an evening aarati similar to those practiced in other Mahadev temples, be initiated. This would encourage local involvement and the everyday flow of visitors, boost



Figure 17. Fishing day



Figure 18. Maintenance program by community

community pride and cultural continuity and increase foot traffic during the ritual hours to create indirect economic benefits for surrounding business.

Boating Activities:

The lack of boating services in Bhaju Pukhu at the moment causes the water body's value as a recreational area to be underutilized. Permitting supervised and environment friendly boating could provide job opportunities for maintenance workers, ticket sellers and boat operators which will also provide the Municipality with a steady stream of income. Also, will increase spending in the surrounding areas by extending guest stay time.

Regulated Vendor Management:

Vendors are currently restricted from operating around the pond. Uncontrolled vending could lead to mess, but a vendor system run by municipality could guarantee cleanliness and bring in money. In order to maintain cleanliness and order around the pond, improve visitor interaction, and generate micro-level revenue, it is recommended that specific vending areas be established.

Development of Resting space and Shade Areas:

The pond currently lacks shaded areas and resting spaces, discouraging longer visits; therefore, initiating tree plantation programs along the perimeter and constructing public seating in traditional architectural styles area recommended to enhance visitor comfort, support local artisans and promote the pond as a welcoming public gathering space.

Provision of Public Amenities:

In order to improve visitor comfort, it is advised to build a clean rest room close to the pond. Visitors expressed the lack of public restrooms as a major inconvenience with allocated parking.

References

- Gautam, D., Thapa, B. R., & Prajapati, R. N. (2018). Indigenous water management system in nepal: Cultural dimensions of water distribution, cascaded reuse and harvesting in bhaktapur city. *Environment, Development and Sustainability*, 20(4), 1889–1900.
- Poudel, R. (2006). Research paper on water and culture [Number 28]. <https://jvs-nwp.org.np/wp-content/uploads/2018/07/Number-28.pdf>

- Poudel, R. (2063). Inscriptional evidence of water management in bhaktapur [BS (Vikram Samvat)].
- Shrestha, P. (2019). *Ejhof k'v'* (tech. rep.). Bhaktapur Municipality. Bhaktapur, Nepal.
- Shrestha, S. (2021). *Community driven approach for revitalization of historic ponds in kathmandu valley* [Unpublished master's thesis], Purbanchal University.
- Tiwari, S. (n.d.). *Traditional water supply system: A historical study of bhaktapur* (tech. rep.) (Accessed via Academia.edu). https://www.academia.edu/10955846/Traditional_Water_Supply_System_A_historical_study_of_Bhaktapur

This work is licensed under a Creative Commons "Attribution-NonCommercial-NoDerivatives 4.0 International" license.

