

Conservation and Sustainable Development of the Hoan Kiem Lake Area, Hanoi: Proposal for a Heritage Conservation and Planning Model

Bao Tran Quoc¹, Dung Vo Thuy^{2,*}, Truong Le Xuan², Tri Nguyen Manh¹

¹Department of Theory & History of Architecture, Faculty of Architecture and Planning,
Hanoi University of Civil Engineering, Vietnam

²Department of Architecture, Faculty of Design, Hanoi Open University, Vietnam

Received July 13, 2025; Revised October 28, 2025; Accepted November 20, 2025

Cite This Paper in the Following Citation Styles

(a): [1] Bao Tran Quoc, Dung Vo Thuy, Truong Le Xuan, Tri Nguyen Manh, "Conservation and Sustainable Development of the Hoan Kiem Lake Area, Hanoi: Proposal for a Heritage Conservation and Planning Model," *Civil Engineering and Architecture*, Vol. 14, No. 1, pp. 47 - 69, 2026. DOI: 10.13189/cea.2026.140104.

(b): Bao Tran Quoc, Dung Vo Thuy, Truong Le Xuan, Tri Nguyen Manh (2026). *Conservation and Sustainable Development of the Hoan Kiem Lake Area, Hanoi: Proposal for a Heritage Conservation and Planning Model*. *Civil Engineering and Architecture*, 14(1), 47 - 69. DOI: 10.13189/cea.2026.140104.

Copyright©2026 by authors, all rights reserved. Authors agree that this article remains permanently open access under the terms of the Creative Commons Attribution License 4.0 International License

Abstract Hoan Kiem Lake and its environs in Hanoi, Vietnam, represent a distinctive urban heritage landscape, embodying significant cultural, historical, architectural, and ecological values. This area additionally functions as a pivotal hub for community engagement and tourism. Nevertheless, escalating urbanization and economic development pressures increasingly threaten the intrinsic values of this space, leading to conflicts between heritage preservation and contemporary developmental imperatives. This research proposes a comprehensive planning-conservation model for the Hoan Kiem Lake area, emphasizing sustainable development. This model integrates modern urban planning principles, indigenous knowledge systems, and robust community participation. The methodological approach combines rigorous document analysis, extensive spatial and socio-cultural surveys, a detailed assessment of heritage functional zoning, and a review of international best practices in heritage conservation. Key findings reveal the primary factors jeopardizing the integrity of this heritage site. Furthermore, the study constructs an integrated theoretical framework that unifies urban planning, architectural and landscape conservation, and sustainable development paradigms. Based on this framework, the proposed planning-conservation model incorporates several critical components: delineated heritage functional zoning, adaptive spatial intervention strategies, multi-stakeholder

coordinated management mechanisms, and initiatives to bolster local community involvement. This research offers substantial theoretical and practical contributions to heritage planning in developing urban contexts, particularly in demonstrating adaptive conservation approaches that reconcile economic growth with the preservation of urban cultural identity. The findings are intended to inform future policy development and guide planning and renovation decisions for Hanoi's central district.

Keywords Hoan Kiem Lake, Spatial Transformation, Heritage Conservation, Sustainable Development, Urban Planning, Urban Identity

1. Introduction

Hoan Kiem Lake and its surroundings serve as both a cultural-historical symbol and a distinctive urban heritage site, embodying the blend of tradition and modernity in Hanoi's development. The area is notable for its valuable architecture, unique public spaces, and vibrant cultural activities. However, as some researchers pointed out, rapid urbanization and rising tourism threaten its original values and intensify conflicts between preservation and

development [1,2].

Research also shows that urban heritage conservation should be integrated into overall planning to balance preservation with contemporary needs [3]. The concepts of “adaptive heritage reuse” and “sustainable urban space development” are increasingly emphasized as appropriate approaches for managing central heritage areas, especially in developing cities [4].

Since the late twentieth century, Hoan Kiem Lake has been the focus of several urban planning projects. However, most have only addressed general planning or landscape improvements, without systematically integrating heritage conservation and urban development [5,6]. Issues of spatial organization, landscape management, and local cultural values remain inadequately integrated into current planning tools [7]. Therefore, this research aims to develop a sustainable planning–conservation model for Hoan Kiem Lake by integrating modern planning, local knowledge, and community participation.

This study aims to propose a sustainable planning–conservation model for Hoan Kiem Lake that balances heritage preservation with current economic, social, and tourism needs. The model seeks to protect both tangible and intangible values while creating a flexible spatial structure adaptable to future urban changes. The study addresses the following key questions:

- What factors are threatening the integrity and heritage value of the Hoan Kiem Lake area?
- What domestic and international principles and experiences can be applied to the conservation planning of central urban heritage areas in Vietnam?
- What kind of planning-conservation model can reconcile the demands of architectural-landscape preservation with sustainable urban development in the context of Hanoi?
- What is the role of the community and local authorities in implementing the planning-conservation model?

This study contributes to urban planning and conservation in three key ways. First, it develops an integrated theoretical framework combining spatial planning, architectural landscape conservation, and sustainable development, applicable to heritage urban centers like Hoan Kiem Lake. Second, by analyzing current conditions and employing spatial social survey methods, it provides empirical data for assessing and zoning heritage functions. Third, it proposes an adaptive, internationally referenced planning-conservation model, offering a new approach to heritage preservation amid rapid urbanization and supporting informed decision-making for local authorities and communities.

2. Literature Review

The relationship between urban heritage conservation and sustainable development has gained increasing

attention, particularly in the context of rapid urbanization. Integrating historic landscape conservation into comprehensive planning is essential to balance cultural preservation with modern development needs [3]. UNESCO’s Historic Urban Landscape (HUL) approach highlights the integration of heritage conservation with socio-economic development, environmental protection, and local community participation [8]. Ashworth [2] identified three main heritage conservation approaches: preservation, adaptive conservation, and heritage, focusing on the symbolic and cultural significance of urban spaces. These approaches have significantly influenced urban heritage conservation policies in the world.

2.1. Adaptive Conservation and Heritage Management

In the context of ongoing urban changes, adaptive reuse has emerged as a flexible and sustainable approach, preserving heritage while revitalizing spaces with new functions suited to modern urban needs [4,9]. This “living heritage” approach sustains cultural values through continuous community interaction. Langston and Shen argue that adaptive reuse is most effective when incorporated into participatory, multi-stakeholder planning, as it reduces conflicts and supports sustainable urban regeneration [10].

2.2. Hoan Kiem Lake in Academic Research

Hoan Kiem Lake has become a focal point in urban planning and heritage studies, with research highlighting its central role in Hanoi’s spatial structure and the ongoing challenge of balancing conservation with modern development. Scholars have emphasized the importance of the lake’s cultural space in urban strategy, advocating for integrated and adaptive planning approaches that address both tangible and intangible heritage values [1,11,12], as well as the need for spatial reorganization and tourism management [12,13]. While detailed plans approved by the Ministry of Construction prioritize landscapes and architectural conservation, they often lack comprehensive integration of transport, public space, and tourism. Studies such as [14,15] underscore the lake’s enduring significance in shaping Hanoi’s identity and activating tourism and commercial activities, particularly through connections with the Old Quarter.

Recent studies using quantitative methods and GIS have modeled significant landscape changes around Hoan Kiem Lake. Shibayama [16] reported a dramatic decrease in the lake’s water surface area from 1885 to 2005. Ren et al. [17] and Pham et al. [18] identified Hoan Kiem as central to Hanoi’s landscape policy across historic periods and highlighted the urgent need to integrate green and open spaces into urban planning, noting that per capita green space in central Hanoi remains below recommended levels.

Hoan Kiem Lake is widely recognized for its high aesthetic, ecological, and social value, providing a quality

living environment and supporting frequent community activities [19,20]. Studies have also documented its significant cooling effect [21] and its central role in both public life and contemporary cultural discourse [22,23]. However, the area still lacks sufficient open space to meet increasing demands, especially given high population density and urban climate challenges [19,24,25].

Overall, Hoan Kiem Lake serves as both a cultural symbol and a core element of Hanoi's urban structure, highlighting the need for a comprehensive planning and conservation model that balances heritage preservation with sustainable development.

2.3. Research Gap

Despite considerable research on urban heritage conservation, there is a lack of context-specific models for high-use heritage areas like Hoan Kiem Lake in Vietnam. Most studies focus on assessments or qualitative proposals rather than integrated, data-driven frameworks. This study addresses this gap by proposing a planning-conservation model tailored to the unique cultural and developmental needs of the Hoan Kiem Lake area.

3. Theoretical Framework

This research proposes an interdisciplinary framework combining heritage conservation, urban planning, and sustainable development. They offer the conceptual tools and criteria needed to analyze and propose an integrated model for conserving and developing the historically and culturally significant Hoan Kiem Lake area.

3.1. Theory on the Heritage Conservation

This study applies the Historic Urban Landscape (HUL) approach by UNESCO [8], which emphasizes integrating cultural and natural values into comprehensive urban planning. This framework is particularly suited to Hoan Kiem Lake, where tangible and intangible heritage coexist in a dense, dynamic setting. It ensures that conservation strategies address both physical structures and the preservation of cultural values, community identity, and continuity of use.

3.2. Sustainable Urban Development

Following the United Nations' Sustainable Development Goals [26], especially Goal 11, this research suggests incorporating environmental, economic, and socio-cultural sustainability into urban heritage contexts. Drawing on [27,28], it viewed sustainability as a dynamic balance between conservation and innovation, identity and modernization, and heritage value and economic growth. This framework assesses how traditional spaces like Hoan Kiem Lake can adapt to contemporary needs while

retaining authenticity.

3.3. Urban Morphology and Spatial Identity

Urban morphology theory [29,30] is used to analyze spatial patterns and architectural forms in the Hoan Kiem area, highlighting the role of physical form in expressing cultural processes and place identity. Concepts such as place identity [31] and "*genius loci*" [32] further inform the understanding of the area's unique character and community attachment.

3.4. Adaptive Reuse and Integrated Conservation Planning

Adaptive reuse is central to the study, enabling heritage buildings to serve new functions while preserving cultural value and supporting economic viability [4,9,33,34]. The research develops a multidimensional conservation model by integrating legal instruments, community-based practices, cultural strategies, and economic mechanisms. This integrated approach addresses the layered spatial, social, and symbolic complexities of the Hoan Kiem Lake area.

3.5. Landscape of Policy and Academic in Vietnam

This study grounds its theoretical framework in Vietnam's policy context by analyzing key official legal documents such as the Law on Cultural Heritage [35] and the Hanoi Capital Master Plan to 2030 [36]. Building upon these existing national conservation frameworks, the study seeks to localize and operationalize policy mandates. It proposes a feasible and adaptable strategic model for the Hoan Kiem Lake area by integrating the necessary pillars of legislation, community participation, economic strategies, and cultural policies. This approach ensures the framework is applicable within the Vietnamese planning and governance system, transforming policy into tangible, on-the-ground action for heritage activation. Bridging international theory with Vietnamese practice ensures the model's institutional compatibility and relevance to local community needs, while synthesizing heritage, sustainability, and urban morphology perspectives provides a solid foundation for context-sensitive planning and conservation.

4. Research Methods

This study employs an interdisciplinary approach, integrating qualitative and quantitative methods for a corpus of empirical data and a comprehensive evaluation of Hoan Kiem Lake's spatial, heritage, and sustainable development values. Various methods include:

- Secondary document analysis of legal, planning, and heritage sources.

- Historical spatial analysis using maps to track changes in structure and land use.
- Visual field surveys to assess current architectural, landscape, and social conditions.
- Community semi-structured interviews with experts, residents, and tourists to gather diverse perspectives.
- SWOT analysis to identify strengths, weaknesses, opportunities, and threats, informing strategic recommendations for sustainable heritage conservation and development.

5. Current Situation and Issues

5.1. Identifying the spatial values of Hoan Kiem Lake

The Hoan Kiem Lake area (Figure 1) (63.72 hectares with approx. six thousand residents) is designated as a central political, cultural, and social hub in Hanoi's urban zoning [37]. It represents a comprehensive heritage site with historical, architectural, ecological, and community significance.

5.1.1. Urban-Spatial Value

The area is organized around the lake as a central landscape core, surrounded by pedestrian zones and a blend of French colonial and traditional architecture. Key landscape axes, such as Le Lai-Le Thach Street, Trang

Tien Street and Nha Tho Street, connect major heritage and administrative sites, illustrating the intersection of Eastern and Western urban forms.

5.1.2. Historical-Cultural Value

Hoan Kiem Lake is linked to important legends and historical events, serving as an administrative and military center through various periods. Monuments such as Ngọc Sơn Temple and Bút Tower, statue of King Le Thai To reflect enduring cultural and spiritual heritage.

5.1.3. Architectural-Landscape Value

The space integrates urban image elements (*landmarks, paths, edges, districts, and nodes in Lynch's theory*), though some recent developments have raised concerns about landscape harmony.

5.1.4. Ecological Value

As a rare "green core" of the inner city, the lake mitigates urban heat, supports biodiversity, and enhances the city's microclimate, which is shown in many studies [17,21,38]. With the capacity to regulate the urban climate, absorb rainwater, and sustain biodiversity, lakes are an essential ecological element that enhances resilience to the impacts of climate change, particularly flooding, pollution, and the urban heat island effect. Therefore, the ecological value of Hoàn Kiếm Lake should be recognized in the context of landscape conservation and as a foundation for adaptive and sustainable urban development strategies.

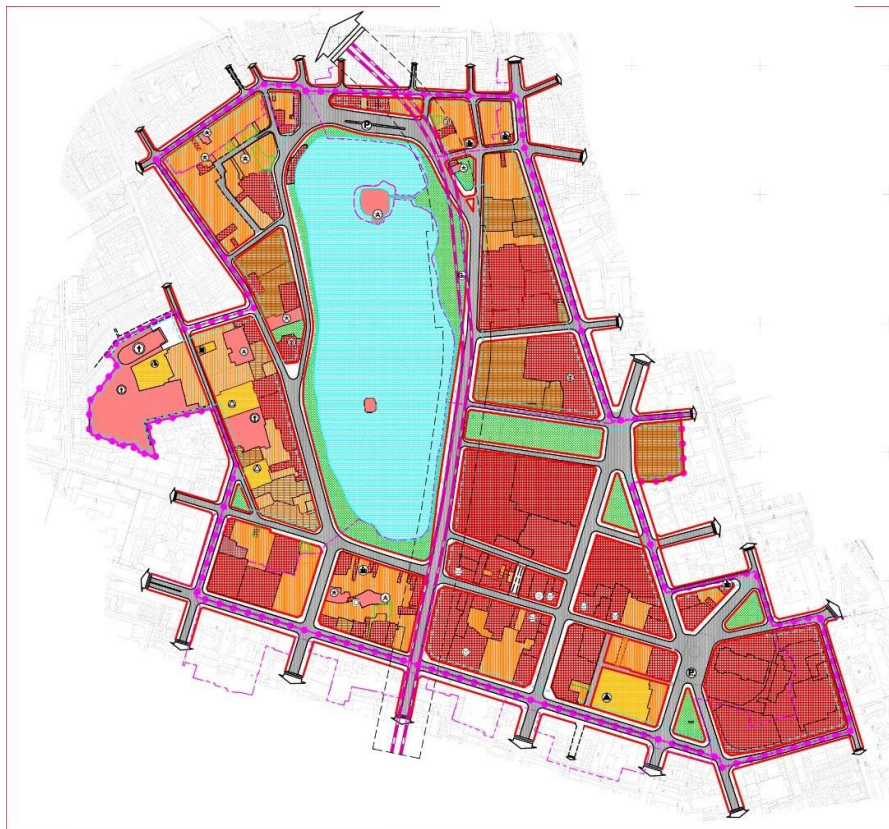


Figure 1. Zoning Plan for the Hoan Kiem Lake Urban Area and Its Surrounding. Source [37]

5.1.5. Social-Community Value

The lake functions as a central public space for cultural, artistic, and community activities, fostering collective memory and connecting tradition with modern life. It is safe to say this area is a “living room” of the Hanoians [22,23,39].

In general, Hoan Kiem Lake is a comprehensive heritage space, integrating both tangible and intangible values. It is not only a national symbol but also plays a practical role in the sustainable development of central Hanoi’s urban area.

5.2. Analysis of Spatial Transformation and Development Trends

This section builds on the historical maps, images, and studies summarized in Section 2.3 to trace spatial changes around Hồ Hoàn Kiếm Lake over time. It further assesses urban development trends in relation to heritage values, spatial structure, and the social, infrastructural, and policy dynamics of transformation.

5.2.1. Historical Spatial Dynamics

Hoan Kiem Lake is closely connected to the national legend and has served as a focal point in the establishment of the Thang Long capital since the fifteenth century. During the Le-Trinh period, the area functioned as both an administrative and spiritual center. However, it experienced a period of decline at the end of the eighteenth

century, subsequently becoming polluted and lacking effective management in the early nineteenth century. Cartographic evidence from 1873 indicates that the western and northern peripheries of the lake had evolved into densely populated residential zones, whereas the eastern side remained a swamp, maintaining a natural connection to the Red River.

From the late nineteenth century onward, under the urban planning initiatives of the French colonial administration, Hoan Kiem Lake was re-envisioned as the landscape nucleus of a modernizing city. Urban thoroughfares, public gardens, and administrative edifices (such as the Governor’s Palace, Post Office, and City Hall) were constructed around the lake, supplanting earlier historical sites. By the 1930s, the spatial configuration of the urban area surrounding the lake had stabilized, signifying a shift from a cultural–spiritual nucleus to a contemporary administrative and commercial center.

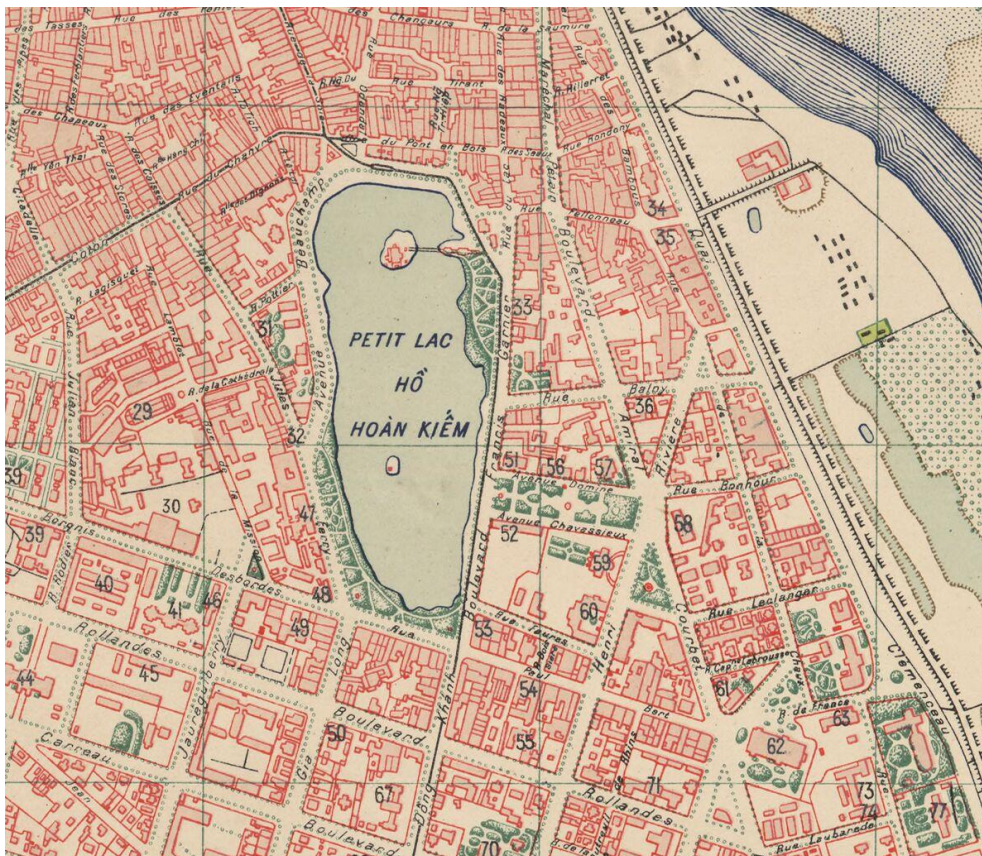
After 1954, when Hanoi became the capital of the Democratic Republic of Vietnam, the lake’s surroundings saw the addition of socialist-realist buildings and a restructuring of urban functions. Since Đổi Mới time (1986–present), the area has faced both commercial pressures and heritage preservation. Since 2016, the established pedestrian zone has marked a new phase that reinforces the lake’s role as a central public space connecting heritage (Figure 12).



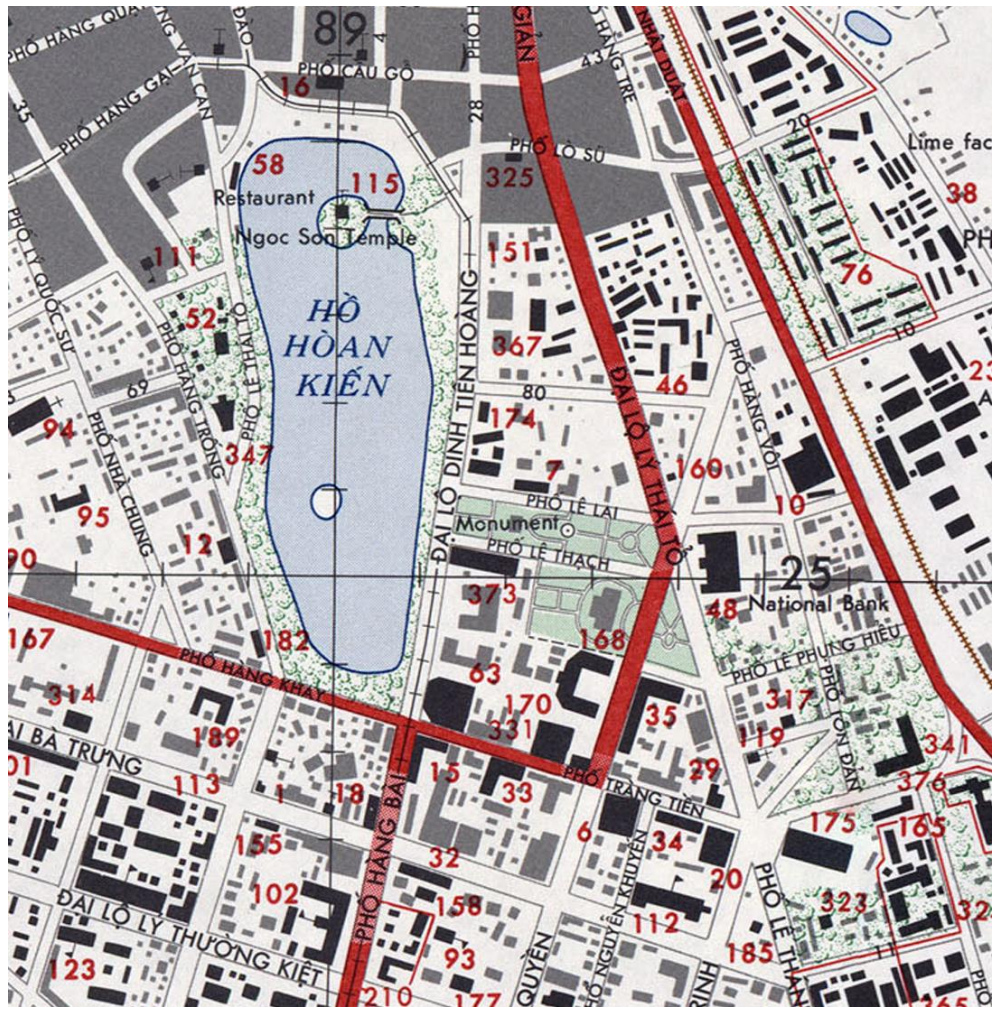
Pre-colonial landscape (1873)



French zoning (1890)

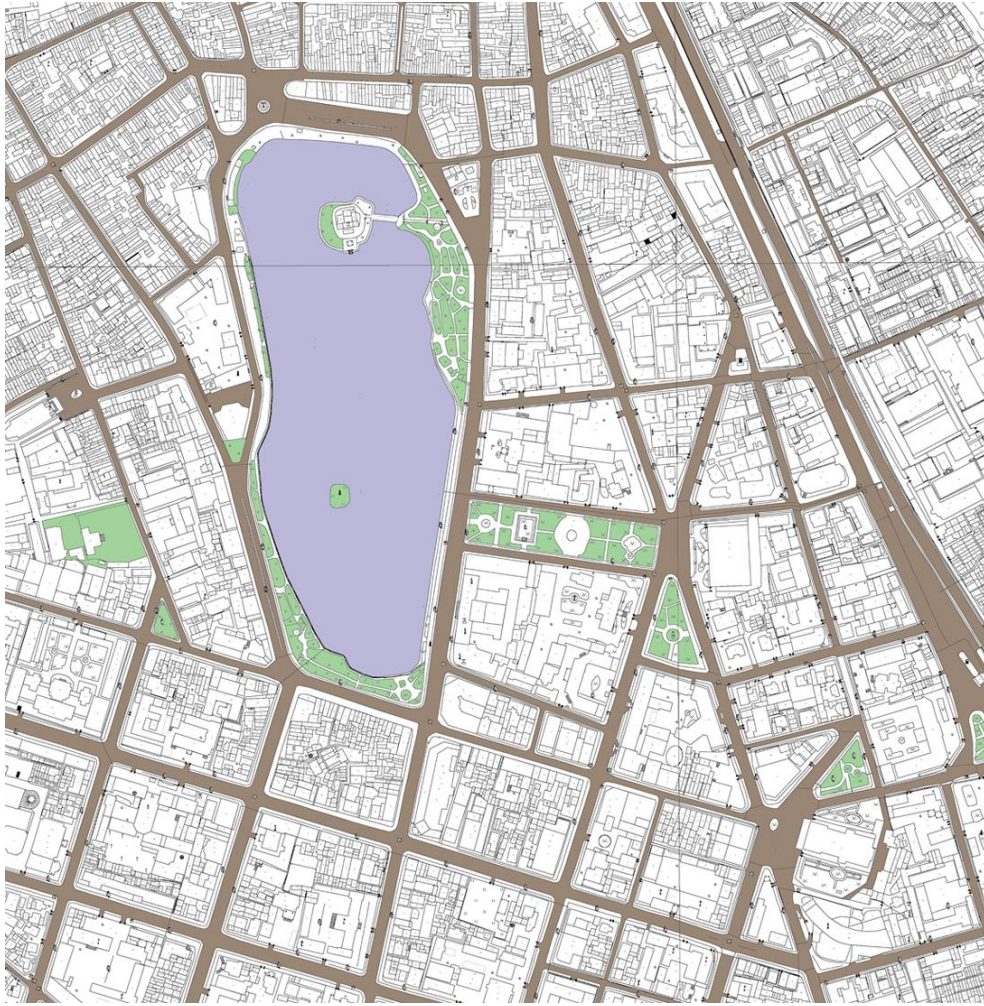


Colonial administrative grid (1929)



Socialist spatial restructuring (1968)

Post-Renovation transition (1992)



Pedestrian-centered planning (2024)

Figure 2. Spatial transformation sequences of Hoan Kiem Lake since 1873 (compiled by the authors from the Vietnamese National Archives and local authority)

5.2.2. Transportation System and Trends of Transition

Following its central location, the area surrounding Hoan Kiem Lake is characterized by a dense and complex transportation network, organized as one-way systems to mitigate traffic congestion. Nevertheless, infrastructural disparities remain, frequently resulting in traffic conflicts at critical nodes such as Dong Kinh Nghia Thuc Square [1]. The planned implementation of Metro Line 2, featuring the underground C9 station on Dinh Tien Hoang Street, is projected to alter the spatial configuration of transportation and heritage accessibility in the area, thereby introducing significant challenges for heritage conservation [5].

Since 2016, the establishment of pedestrian streets around the lake has generated vibrant public spaces and enhanced connectivity between the lake and the Old Quarter. This development exemplifies a broader shift from “motorized traffic” to “pedestrian-oriented spaces,” consistent with the principles of sustainable urban development.

5.2.3. Urban Spatial Organization

According to Lynch’s spatial cognition framework [40] the Hoan Kiem Lake area demonstrates a clearly defined urban visual structure, comprising the following elements:

- **Landmarks:** The Ngọc Sơn Temple complex, The Huc Bridge, Pen Tower, and Turtle Tower.
- **Paths:** The axes formed by Ly Thai To Garden and the Hang Khay–Trang Tien corridor.
- **Edges:** The streets encircling the lake, each distinguished by unique architectural and functional characteristics.
- **Districts:** The eastern sector (administrative), the northern sector (cultural–religious), the western sector (commercial–press), and the southern sector (vibrant commercial activity).
- **Nodes:** Dong Kinh Nghia Thuc Square and Ly Thai To Garden.

This spatial organization facilitates functional diversity and accentuates the lake’s role as a focal point of urban identity and as a key reference in the spatial cognition of central Hanoi.

5.2.4. Architectural and Landscape Heritage

The environs of Hoan Kiem Lake are notable for their high concentration of significant heritage structures (Figure 3), including the Ngọc Sơn Temple complex, Ba Kieu Temple, the statue of King Le Thai To, Ba Da Pagoda, Quang Minh Pagoda, and a range of colonial-era architectural works. The area also exhibits a remarkable

diversity of architectural styles—encompassing traditional, colonial, Art Deco, socialist realist, and modern forms—which collectively reflect the ongoing processes of urban transformation across multiple historical periods. Achieving a harmonious balance between preservation and development remains a fundamental challenge for future urban planning in this context.



a) Panoramic view of Hoàn Kiếm Lake in the colonial period (Source: Vietnamese National Archives)



b) Panoramic view of Hoàn Kiếm Lake in the colonial period (Source Vũ Minh Quan)



c) Đinh Tiên Hoàng Street before the pedestrian zone (Source: Authors)



d) Đinh Tiên Hoàng Street after the pedestrian zone (Source: Authors)



e) Ngọc Sơn Temple in the colonial period (Source: Vietnamese National Archives)



f) Ngọc Sơn Temple today (Source: Authors)



g) The office of L'Avenir du Tonkin in the colonial period (Source: Vietnamese National Archives)



h) The office of L'Avenir du Tonkin today (Source: Authors)

Figure 3. Then-and-Now photo pairs illustrating the spatial transformation of Ho àn Kiém Lake and its surroundings

5.2.5. Causes and Interpretation of Spatial Transformation

The spatial transformations of the Ho àn Kiém Lake area are not merely material changes but also deeply reflect historical–political contexts, urban governance models, and shifting perceptions of heritage values. These dynamics can be explained by the following factors:

(i) *Functional shifts in line with power contexts:* The replacement of traditional monuments with administrative buildings during the French colonial period illustrates how the central space was redefined under the logic of colonial urbanism, which regarded Ho àn Kiém Lake as an administrative–landscape axis rather than a communal spiritual space.

(ii) *Impact of modernization and economic growth:* Following Vietnam's *Đổi Mới* policy in 1986, the Ho àn Kiém area witnessed an expansion of commercial and service functions. This aligns with the “urban growth machine” theory [33], which highlights the role of economic and investment dynamics in restructuring central urban spaces.

(iii) *Reclaiming public space:* The establishment of the pedestrian zone in 2016 reflects the repositioning of Ho àn Kiém Lake as a strategic public space. It signals a shift in urban governance—from prioritizing motorized traffic to emphasizing community experience and heritage preservation.

(iv) *Influence of conservation policies and legal frameworks:* Efforts to preserve and restore heritage sites around the lake have been driven by the Law on Cultural Heritage (2001, amended 2009) and Old Quarter planning policies, demonstrating a direct link between spatial change and institutional adjustments.

Overall, spatial transformations at Ho àn Kiém Lake emerge from the interplay of three main forces: (1) political power and urban governance; (2) market dynamics and

economic growth; and (3) global trends in heritage conservation and public space regeneration. This interweaving has shaped the area's distinctive trajectory of change and development.

5.3. Field Survey of the Hoan Kiem Lake Space

The research team conducted a comprehensive field survey in the Hoan Kiem Lake area between April and June 2025. This investigation entailed systematic observation, detailed note-taking, photographic documentation, and the evaluation of the current condition of architectural spaces, landscapes, and patterns of public space utilization within the study area. The scope of the survey encompassed the entire lakeside zone, including architecturally and culturally significant structures, community gathering spaces, pedestrianized streets, as well as areas identified as being at risk of deterioration or subject to inappropriate interventions.

The methodological approach integrated both qualitative and quantitative techniques. The research team subdivided the area surrounding the lake into spatial segments according to usage characteristics, user density, and heritage value. Within each segment, detailed records were compiled regarding: (i) the current use of space; (ii) the state of architectural and landscape heritage conservation; (iii) the impacts of commercial and tourism activities; and (iv) the condition of green spaces, water surfaces, and urban infrastructure.

The findings of the survey (see Table 1) yielded a robust body of empirical data, which serves as a foundation for analyzing existing challenges, identifying developmental potential, and formulating recommendations for interventions aimed at preserving distinctive values and enhancing the sustainability of the Hoan Kiem Lake space.

Table 1. The findings of the survey, conducted by researchers

No.	Survey Area	Spatial Type	Current Use	Heritage Value	Conservation Status	Existing Issues / Recent Changes
1	Ngoc Son Temple Complex, The Huc Bridge	Historical and Cultural Heritage Site	Tourism and Pilgrimage	High	Well Preserved	Overcrowding, Impacted by Commercialization
2	Ba Kieu Temple	Historical and Cultural Heritage Site	Tourism and Pilgrimage	High	Well Preserved	Located Next to a Busy Intersection, Lacking Buffer Space
3	King Le Thai To Statue Area	Historical and Cultural Heritage Site	Tourism and Pilgrimage	High	Well Preserved	Conflict Between Memorial Function and Community Activities
4	Dong Kinh Nghia Thuc Square	Public and Social Space	High Concentration of People, Numerous Festivals	Medium	Relatively Well Preserved	High Tourism Pressure, Lack of Sound Control
5	East and South Lakeside Area (Dinh Tien Hoang Street)	Pedestrian Street, Lakeside Landscape Route	Walking, Photography, Resting	Medium	Fairly Well Preserved	Some Pavement Sections Deteriorated, Uneven Greenery
6	West Lakeside Area (Le Thai To Street)	Walking Route, Food and Beverage Services	Combination of Walking and Business Services	Medium	Strongly Intervened	Sidewalk Encroachment, Lack of Urban Activity Organization
6	South Lakeside Area (Hang Khay Street)	Walking Route, Diverse Services	Combination of Walking and Business Services	Medium	Relatively Well Preserved	Sidewalk Encroachment, Lack of Urban Activity Organization
7	King Ly Thai To Statue Area	Square, Memorial Space	Community Activities, Political and Cultural Events	High	Well Preserved	Some Landscape Details Encroach on Public Walkways
8	Hoan Kiem Lake Water Surface	Ecological and Landscape Space	Open Space, No Direct Use	High	Stable but Environmentally Impacted	Some Minor Pollution Phenomena, Seasonal Algal Blooms

5.4. Community Survey on the Hoan Kiem Lake Space

To evaluate public perceptions, expectations, and levels of satisfaction concerning the spatial environment of the Hoan Kiem Lake area, the research team administered an anonymous survey comprising $n = 302$ participants. The sample included locals, tourists, subject matter experts, and administrative officials, of whom 50.3% reported prior involvement in conservation activities. The demographic composition of the respondents is presented in Figure 4, while a summary of the survey findings is provided in Table 2.

The survey results indicate that both residents and users of the Hoan Kiem Lake area possess a clear awareness of the urban heritage value and the role of the lake as a central public space. Nevertheless, there are considerable concerns regarding the decline in the quality of the living environment, pressures on infrastructure, and the impact of mass tourism. Notably, nearly half of the respondents reported prior participation in conservation activities, highlighting the potential for mobilizing community engagement in sustainable development initiatives. These findings constitute a critical foundation for formulating feasible and contextually relevant models for planning and conservation.

Semi-structured interviews further reveal that:

- **Experts** emphasize the necessity for a comprehensive conservation model, grounded in functional zoning and heritage stratification.
- **Local authorities** express challenges in coordinating among administrative levels and point to inconsistencies in planning policies.
- **Residents and visitors** express a desire for the continued development of the Hoan Kiem Lake space, provided that its historical identity is preserved, alongside improvements in public amenities, green environments, and accessible infrastructure.

5.5. SWOT Analysis in Management and Development Spatial Planning of Hoan Kiem Lake's Area

The Hoan Kiem Lake area constitutes a significant cultural and historical center, embodying millennia of accumulated civilizational values. The application of SWOT matrix analysis, as presented in Table 3, to the management, planning and spatial development of this area and its surroundings provides a scientific foundation for formulating strategies aimed at the conservation and sustainable development of Hanoi's urban heritage space.

A comprehensive SWOT analysis reveals that the spatial

context of the Hoan Kiem Lake area is endowed with numerous favorable conditions for sustainable conservation-oriented development, while simultaneously

confronting significant challenges related to institutional frameworks, physical space, and socio-environmental pressures.

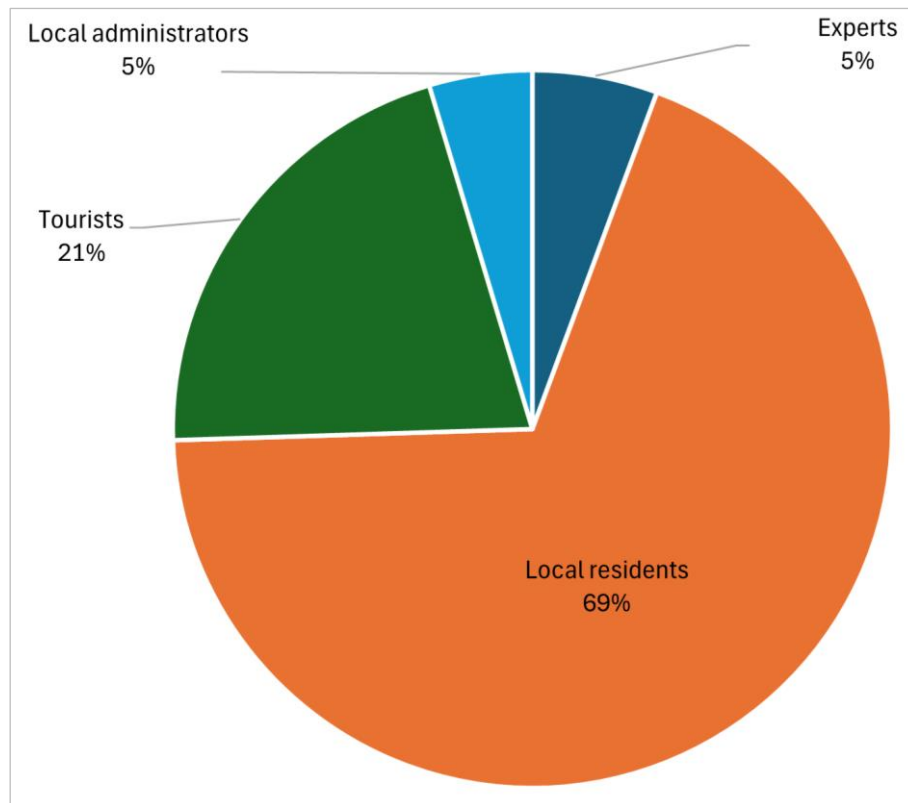


Figure 4. Chart of demographic composition of the respondents

Table 2. Key findings

<i>Survey topic</i>	<i>Key findings</i>	<i>Proportion Rated "important" or higher (%)</i>
<i>Highly valued spatial elements</i>		
<i>Hoan Kiem Lake, ancient structures, and cultural monuments</i>	These elements are highly appreciated by respondents.	>60%
<i>Sidewalks, pedestrian spaces, lakeside greenery</i>	Recognized for their contribution to the quality of public space.	>65%
<i>French colonial architecture, squares, pedestrian streets</i>	Valued for their historical and urban character.	~60%
<i>Intangible cultural values (traditions, legends, festivals)</i>	Acknowledged as important to the area's identity.	~60%
<i>Prominent Issues Needing Resolution</i>		
<i>Lack of community spaces, traffic congestion, environmental pollution</i>	Identified as the most pressing concerns.	>65%
<i>Uncontrolled urbanization, pressure from commercialization</i>	Seen as significant challenges to the area's sustainability.	~60%
<i>Limitations in management mechanisms, lack of community consensus</i>	Noted as barriers to effective conservation and development.	>55%

Table 3. SWOT analysis in management, planning and spatial development of the area. Source authors

Strengths	Weaknesses	Opportunities	Threats
S1. There is a clearly defined zoning plan and specific management regulations; recognized as a National Historical and Cultural Monument, providing a strong legal foundation for conservation efforts.	W1. Limited vacant land; population growth exerts pressure, and population dispersal policies are not feasible.	O1. Digital transformation and new technologies enable more effective management and conservation methods.	T1. Climate change accelerates heritage degradation and reduces the quality of life.
S2. The area's scale and population are clearly delineated (63.72 hectares, 6,200 residents projected by 2050), facilitating effective management of needs and services.	W2. Lack of suitable space to supplement deficient technical and social infrastructure.	O2. Population growth and increased tourism drive demand for new services and products	T2. Population and technological growth may cause pollution and urban environmental decline.
S3. The planning framework emphasizes both tangible and intangible heritage values; the successful expansion of pedestrian streets has enhanced cultural and tourism appeal.	W3. Conservation models lack innovation and do not meet practical requirements.	O3. Green development trends and globalization promote Green Economy and Circular Economy models.	T3. Overloaded and deteriorating technical–social infrastructure is difficult to upgrade in limited space.
S4. The location serves as a link between the Old Quarter and the French Quarter, bringing together diverse architectural styles and cultural–spiritual values, resulting in a historically rich and distinctive space.	W4. Complex ownership and functional arrangements of buildings complicate unified management.	O4. Virtual reality technology supports heritage conservation and communication, attracting external investment.	T4. New architecture and landscape changes risk disrupting traditional identity.
S5. Open spaces with abundant ecological landscapes; integration of residential and commercial functions creates distinctive urban value.	W5. Conflicts between conservation and development slow progress, increase costs, and limit investment effectiveness.	O5. Distinctive intangible cultural heritage can be leveraged for service development and institutional innovation.	T5. Ineffective population dispersal policies; residents' livelihoods are not guaranteed.
S6. As the political, economic, and cultural center of the capital, the area fosters strong cultural and commercial exchanges and increases available resources.	W6. Insufficient data and ineffective conservation methods; challenges in restoration and achieving social consensus.	O6. Digital technology acts as a catalyst for addressing management and sustainable development challenges.	T6. Nighttime cultural and service activities are often incompatible with heritage spaces.
S7. The area is prioritized for investment in cultural projects and features a relatively high educational level, enabling rapid absorption of sustainable urban development trends.	W7. Financial resources are dispersed and budget-dependent; lack of strategies to promote sustainable urban culture.		T7. Rising land prices and investment costs hinder urban renewal and conservation.
S8. Local authorities possess deep experience and understanding of the heritage spatial characteristics, playing a coordinating role and ensuring stability during transitions.	W8. Local planning adjustments are inconsistent; risks of interest group influence and insufficient community consultation.		T8. There is a risk of losing urban identity in the context of globalization if timely strategies are lacking.

5.5.1. Strengths

The area benefits from an approved zoning plan and an established system of regulations governing construction, conservation, and heritage enhancements, thereby providing a robust legal foundation for effective management. Hoan Kiem Lake functions as a pivotal nexus between two urban districts of distinct historical and cultural significance—the Old Quarter and the French Quarter—while also serving as a prominent urban landscape center. The presence of water bodies, greenery, spiritual architecture, and traditional cultural activities not only enhances spatial identity but also facilitates the integration of heritage values into the fabric of contemporary urban development.

5.5.2. Weaknesses

Conversely, the area's principal weaknesses reflect

practical limitations, particularly in terms of spatial and resource constraints. Limited land availability, incomplete technical infrastructure, fragmented management structures, and the absence of effective coordination mechanisms across administrative levels constitute major barriers to the implementation of heritage space renewal and restructuring initiatives. Additionally, existing conservation models tend to be formalistic and lack the flexibility required to adapt to emerging development needs and the evolving aspirations of the resident community.

5.5.3. Opportunities

In this context, opportunities arise from digital transformation, virtual reality technologies, and the global trend towards green development, all of which open new avenues for the creative preservation and promotion of

heritage values. The advancement of cultural industries and the development of tourism services associated with intangible cultural spaces provide a foundation for revitalizing the heritage area while ensuring sustainability.

5.5.4. Threats

On the other hand, the most pressing contemporary threat lies in the potential loss of urban identity amid rapid urbanization and the absence of a strategic orientation. Climate change, infrastructure overload, conflicts between conservation and development, escalating reconstruction costs, and the risk of excessive commercialization collectively necessitate a highly integrated, flexible, multidisciplinary, and community-based planning and conservation model.

5.5.5. Synthesis

The sustainable development of the Hoan Kiem Lake area requires a transition from fragmented management to an integrated approach that closely aligns urban planning, heritage conservation, and socio-economic development. The model proposed in this study aims to address fundamental contradictions, leverage strengths and opportunities, and systematically mitigate weaknesses and challenges.

6. Proposed Model for Planning and Heritage Conservation in the Hoan Kiem Lake Area

The proposed planning and heritage conservation model for the Hoan Kiem Lake area is developed by integrating international heritage conservation principles with the unique context of a rapidly developing historic city such as Hanoi, while emphasizing multi-stakeholder participation. This model seeks to balance the preservation of both tangible and intangible heritage values with the need to fulfill sustainable economic, social, and environmental development objectives.

6.1. Principles of the Proposed Model

- **Preservation of authenticity and integrity:** Maximizes the preservation of historical, architectural, and contextual values of structures, spaces, and landscapes within the Hoan Kiem Lake area. All interventions must respect original structures, materials, and historical significance.
- **Adaptation and enhancement of amenities:** Improve the quality of life for current residents and enhance visitor experiences by upgrading amenities and technical infrastructure in a manner harmonious with heritage elements, ensuring effective functionality in contemporary climatic and social conditions.

- **Environmental sustainability:** Minimizes negative environmental impacts, protects aquatic ecosystems and green landscapes of Hoan Kiem Lake, and promotes green spatial solutions to reduce air, water, and noise pollution in the area.
- **Sustainable and responsible economic development:** Enhances the economic value derived from heritage through cultural tourism and related service activities, while ensuring core values are not compromised, avoiding excessive commercialization, and promoting the interests of the local community.
- **Harmonious integration:** Permits the development of new spatial and functional elements (architectural works, cultural spaces, urban services) only when they respect the spatial structure and traditional architectural forms, ensuring continuity and aesthetic harmony.
- **Multi-stakeholder governance and Community participation:** Guarantee the voices, roles, and interests of all stakeholders (government, experts, residents, businesses, tourists) in decision-making, planning, and the implementation of conservation and development activities.

6.2. Structure of the Planning Conservation Model

The model contained three integrated layers (Figure 5):

6.2.1. Spatial Architectural Layer

Within this layer, the area is divided into zones for conservation purposes:

- **Core Zone:** Encompasses areas of exceptional heritage value, including Hoan Kiem Lake (the water surface and associated architectural elements such as Ngoc Son Temple, Turtle Tower, etc.), King Le Thai To Monument, Ba Kieu Temple, and adjacent nationally recognized monuments. This zone requires the strictest conservation, focusing on maintaining authenticity and integrity.
- **Buffer Zone:** Surrounds the core, including streets, valuable historic buildings, and public spaces around the lake. Its function is to shield the core of adverse impacts while allowing tightly regulated economic, social, and tourism activities in harmony with the landscape and heritage values. Renovation and new construction must comply with strict regulations on height, density, and architectural form.
- **Transition Zone:** Adjacent to the buffer, this area mediates between the conservation zones and modern urban development. Planning here should ensure a smooth, aesthetically harmonious transition. Development activities may be more flexible but must adhere to guiding principles to avoid disrupting the overall landscape and heritage values.

In addition, the model calls for the establishment of architectural control regulations regarding building height,

massing, materials, and color palettes, to preserve the harmony and integrity of the whole urban landscape.

6.2.2. Functional–Economic Layer

This layer focuses on the following aspects:

- **Maintain traditional living spaces:** Combine with the development of a heritage-based economy, including handicrafts, cultural tourism, and services related to gastronomy and performing arts.
- **Support livelihood transitions:** Provide assistance for occupational transitions and livelihood improvements for residents affected by relocation or changes in land use.

6.2.3. Governance–Institutional Layer

Key components of this layer include:

- **Establish a specialized urban heritage management system:** Create a Hoan Kiem Lake Management Board operating under a multi-stakeholder cooperation model.
- **Implement Heritage Impact Assessment (HIA):** Require HIA processes for all architectural or planning interventions.
- **Enhance digital capacity:** Digitally archive building data, planning maps, and heritage status for use in monitoring, maintenance, and communication.

The proposed model aims to resolve inherent contradictions, leverage strengths and opportunities, and provide an integrated, adaptive framework for the sustainable conservation and development of the Hoan Kiem Lake heritage area.

6.3. Principal Solutions of the Proposed Model

6.3.1. Spatial Planning and Design Solutions

- **Clear functional zoning:** The model specifies three spatial tiers (core, buffer, and regulated development zones) through detailed 1:500 planning maps, accompanied by explicit regulations on density, height, setbacks, materials, color schemes, and architectural forms.
- **Identity-based urban design:** It advocates heritage-sensitive urban design principles, ensuring harmonious transitions between new developments and existing architectural contexts.
- **Expansion of public and lakeside spaces:** The model calls for the renovation of pedestrian routes, enhancement of open lakeside spaces, and improved connectivity among cultural and tourism nodes to increase both the attractiveness and multifunctional usability of the area.

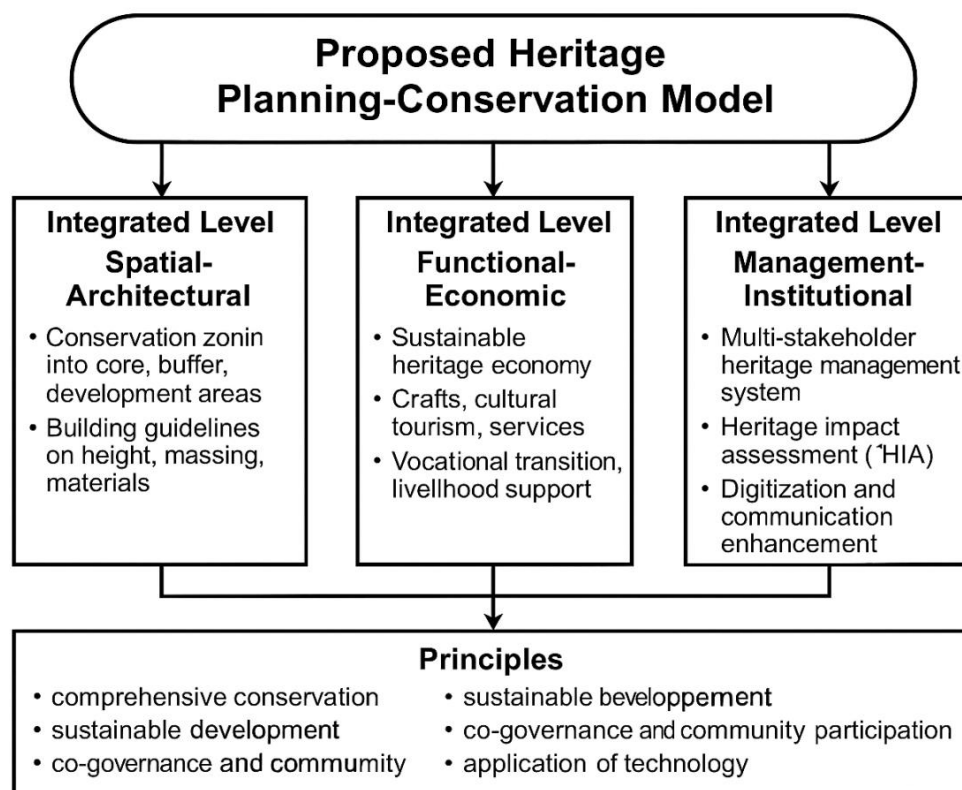


Figure 5. Diagram of proposed model by authors

6.3.2. Heritage Conservation and Infrastructure Upgrading

- **Integrated conservation of structures and landscapes:** Beyond the restoration of nationally recognized monuments, the model emphasizes the sustainable adaptive reuse of historic buildings and traditional streetscapes.
- **Transportation system improvements:** Proposals include smart and sustainable mobility solutions, such as restricting private vehicles in the core zone, developing environmentally friendly public transport (e.g., electric vehicles, buses, bike-sharing), and promoting walkability.
- **Heritage-friendly infrastructure upgrades:** The plan involves modernizing water supply and drainage, electrical and lighting systems, and environmental sanitation, with underground installations and materials compatible with the historic urban landscape.
- **Development of public amenities:** Essential facilities such as standardized public restrooms, multilingual tourist information points, shaded rest areas, first-aid stations, and phone charging points are to be provided.

6.3.3. Solutions for Climate Change Adaptation and Resilience

- **Protect and enhance the lake's ecological role:** Recognize Hoàn Kiếm Lake as blue-green infrastructure that regulates the microclimate, stores water, and sustains biodiversity, thereby integrating it into strategies for flood mitigation and reducing the urban heat island effect.
- **Strengthen sustainable infiltration and drainage:** Apply green infrastructure solutions (permeable pavements, bioretention planters, bioswales) to ease stormwater pressure during heavy rains while improving surface water quality.
- **Preserve and expand urban greenery:** Maintain, restore, and plant native trees to increase green coverage, enhancing both landscape quality and climate resilience.
- **Integrate climate criteria into planning and heritage conservation:** All architectural, infrastructural, and tourism interventions around the lake should assess climate impacts to ensure heritage preservation while adapting to extreme climate conditions.

6.3.4. Sustainable Tourism Management

- **Development of in-depth tourism products:** The focus is on creating educational and authentic cultural, historical, and ecological tourism experiences (e.g., thematic tours, folk culture, traditional crafts), while avoiding overcrowding and excessive commercialization.

- **Visitor flow and capacity management:** Measures are to be implemented to regulate visitor numbers, especially during peak hours and major events, thereby reducing pressure on infrastructure, monuments, and the environment.
- **Promotion of responsible tourism:** The model includes ongoing multimedia campaigns and educational programs to raise awareness among visitors and the community of heritage, local culture, and environmental protection, encouraging responsible tourist behavior.

6.3.5. Policy and Urban Governance Solutions

- **Strengthening interdepartmental coordination:** Mechanisms are to be established and reinforced to ensure consistency and integration across all municipal departments, with enhanced information exchange between central, local, and grassroots management levels.
- **Application of Heritage Impact Assessment (HIA):** All development, renovation, or economic-tourism projects must undergo heritage impact assessment before approval.
- **Diversification of financial resources:** The model proposes combining state budgets, private investment, international funding, and community-based funds to reduce dependency and increase flexibility in conservation program implementation.

6.3.6. Communication, Education, and Community Engagement

- **Enhancing heritage communication:** Multi-platform digital media will be used to disseminate knowledge, awareness, and pride regarding the heritage of Hoan Kiem Lake.
- **Heritage education in the community and schools:** The organization of heritage experience programs for students and residents aims to cultivate a new generation committed to protecting and developing heritage spaces.
- **Fostering community participation:** The establishment of resident advisory councils and the incorporation of community feedback into planning, design, and public space management are prioritized.

6.3.7. Technological and Digital Transformation Solutions

- **Development of digital heritage databases:** The model calls for the digitization of all planning maps, building data, area histories, and restoration records to support management and research.
- **Application of Augmented and Virtual Reality (AR/VR):** These technologies are to be employed for reconstructing historical development phases or lost structures, serving educational, tourism, and spatial planning purposes.
- **Implementation of Smart monitoring systems:** Sensors, cameras, and big data analytics will be used

to monitor infrastructure status, public space usage, environmental quality, and security within the heritage area.

The proposed model embodies a contemporary, integrated, and interdisciplinary approach, grounded in the practical demands of managing, conserving, and developing Hoan Kiem Lake as a dynamic heritage site. Its solutions are mutually reinforcing, aiming to balance heritage preservation, economic growth, and urban livability. By employing a multi-layered framework, encompassing spatial, infrastructural, policy, communities, and technological dimensions, the model promotes the long-term sustainability of both tangible and intangible heritage assets. Furthermore, it offers practical, adaptable strategies applicable to other historic urban areas in Vietnam and Southeast Asia confronting rapid urbanization and globalization.

6.3.8. Stakeholder Participatory Framework

- **Multi-level participation:** Clearly defines the roles of four main groups: (i) government and state management agencies; (ii) local communities; (iii) tourism and service enterprises; (iv) researchers, social organizations, and visitors.
- **Continuous participation mechanism:** Establishes regular consultation forums (workshops, community dialogues, online surveys) to gather input on planning, adaptive reuse of buildings, and the organization of public spaces.
- **Role in adaptive reuse projects:** Residents directly participate in selecting design options, testing new uses for old buildings, and monitoring implementation processes.
- **Operational coordination mechanism:** Forms an inter-sectoral management board with representatives from communities, government, businesses, and academia to ensure consensus, transparency, and long-term sustainability.

The proposed solution pillars embody an integrated, cross-disciplinary approach that balances heritage preservation, economic growth, and urban livability. By adopting a multidimensional lens—spanning space, infrastructure, policy, community, ecology, and technology—the model safeguards heritage values while remaining adaptable to contemporary challenges. Crucially, the stakeholder engagement framework underpins both feasibility and social consensus during implementation.

6.4. Spatial Example of the Planning-Conservation Model

To evaluate the feasibility and practical application of the proposed planning–conservation model, the study presents two key illustrations: (a) a functional zoning map of the Hoan Kiem Lake area, and (b) a sustainable façade

conservation strategy for heritage buildings along Hang Khay Street. This selection is based on current land use, intervention needs, and the potential for integrating heritage conservation with urban development.

6.4.1. Functional Zoning According to Conservation Levels

Based on heritage value and development capacity, the Hoan Kiem Lake area is delineated into three zones, each subjected to a distinct degree of intervention (Figure 6):

- **Core Zone:** This zone encompasses Hoan Kiem Lake itself, along with emblematic landmarks such as Ngọc Sơn Temple, Turtle Tower, Bút Tower, Thê Húc Bridge, and other iconic structures. It is recognized as an area of exceptional historical and cultural significance, warranting comprehensive conservation measures that preserve both its physical form and landscape integrity.
- **Buffer Zone:** Comprising the streets encircling the lake, the buffer zone acts as a transitional space between the heritage core and surrounding functional areas. Adaptive conservation strategies may be implemented here, including façade rehabilitation, the organization of traditional economic and cultural activities, and strict limitations on new construction.
- **Transition Zone:** This zone includes secondary streets and areas adjacent to major landmarks such as the Opera House and St. Joseph’s Cathedral. It is designated for the integration of new development elements, such as transportation infrastructure, public amenities, and urban services, provided that such interventions do not compromise the overall landscape character.

6.4.2. Context-Sensitive Adaptive Facade Conservation for Hang Khay Street

To enhance the aesthetic, cultural, and commercial value of Hang Khay Street—a prominent frontage along the southern edge of Hoan Kiem Lake—a context-sensitive adaptive facade conservation strategy is proposed, guided by the following design principles:

- **Unified ground floor design:** The ground floor should adopt a more open configuration, utilizing transparent glass and slender aluminum frames to strengthen the visual and physical connection between interior spaces and the pedestrian street. Glass frameworks must be flexibly articulated, standardized in height and profile across the entire street to ensure visual coherence.
- **Reorganization of signage systems:** Regulations should specify signage dimensions, placement, and materials: height not exceeding 0.6 meters aligned with the top of ground-floor glass doors, and the use of neutral colors without flashing lights or reflective materials. Signage design should be standardized in a French colonial style or a neoclassical architectural style to ensure streetscape harmony.

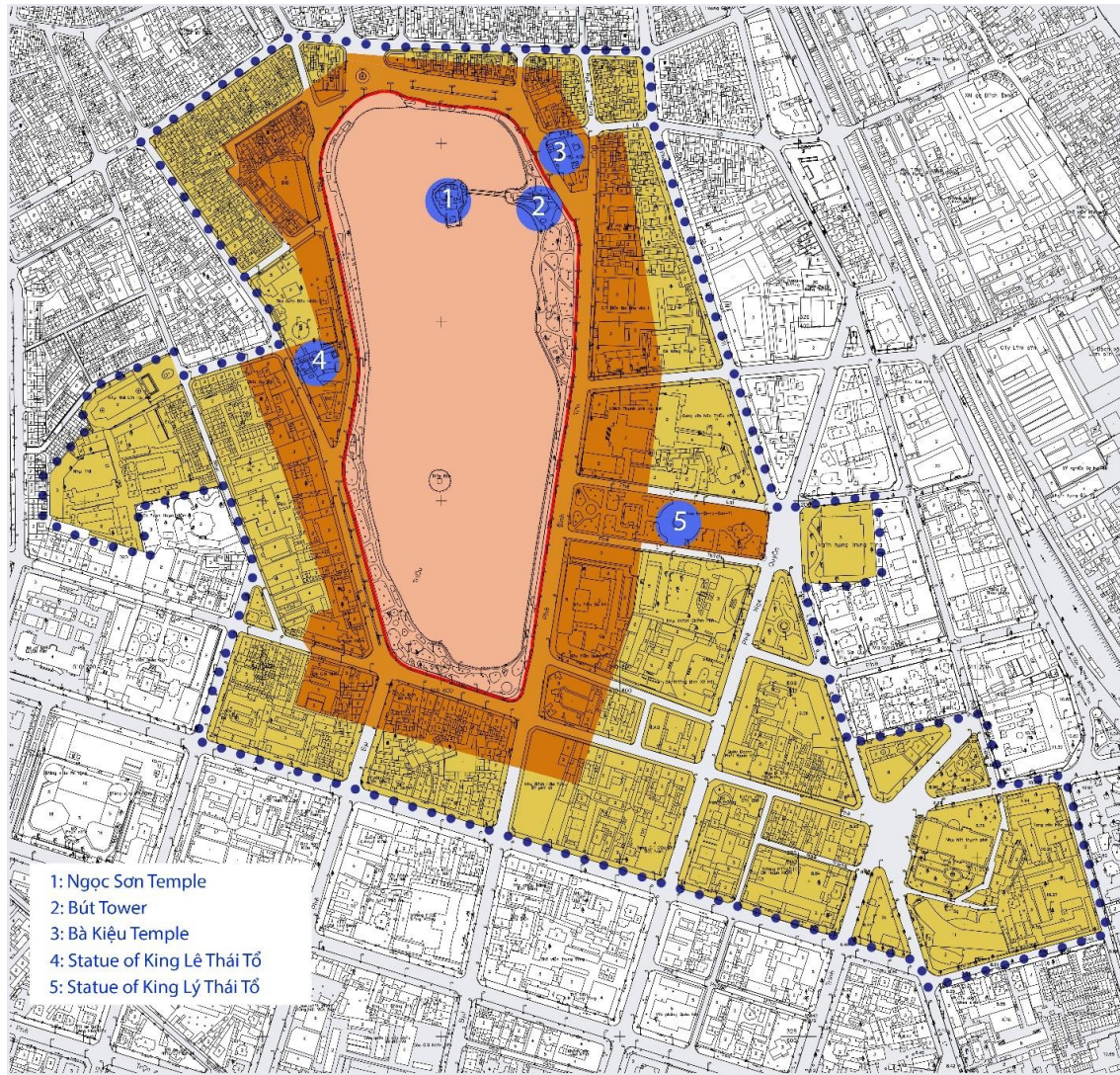


Figure 6. Diagram of the proposal zoning area. Draw by authors

- Elimination of inappropriate interventions:** Unauthorized additions such as corrugated metal roofs, protruding canopies, and oversized signage must be removed. Visual clutter, including tangled electrical wires, exposed pipes, and technical boxes, should be systematically cleared to improve the façade's appearance.
 - Restoration and conservation of original upper-floor elements:** Original architectural details—such as wrought iron balconies, wooden window frames, architectural moldings, and shutters—should be researched and restored based on archival documents or historical photographs. The use of original or aesthetically compatible materials is prioritized, and inauthentic “faux-historic” reproductions should be avoided.
 - Consistency in color and finishing materials:** Wall and window colors should follow the palette typical of the French colonial period (light yellow, ivory white, moss green, deep marine blue). Façade walls should be finished with mineral lime paint or traditional faux-stone coatings, replacing modern paints prone to peeling. Wooden windows and iron railings are to be standardized, avoiding the use of aluminum, glass, or stainless steel on the upper floors.
 - Establishment of management and renovation support mechanisms:** Technical and financial support mechanisms should be provided to residents undertaking renovations. Standardized design guidelines and façade management regulations should be issued to serve as the basis for renovation and refurbishment permits.
- To operationalize the context-sensitive adaptive facade conservation principles for Hang Khay Street (Figure 7), the research team proposes a set of illustrative design solutions. The research suggests a schematic proposal for Hang Khay Street (Figure 8), identifying architectural elements that should be preserved, renovated, or removed, aiming to achieve aesthetic, functional, and cultural-historical coherence along the entire street frontage.

The illustrative drawings detail a ground-floor renovation strategy that supports commercial use while preserving upper-floor authenticity, aiming to create a

distinctive commercial-heritage street that integrates contemporary and historical elements and enhances central Hanoi's urban identity (Figure 9, Figure 10, Figure 11).



Figure 7. Hang Khay Street in the early 20th century. Source Vietnamese National Archives

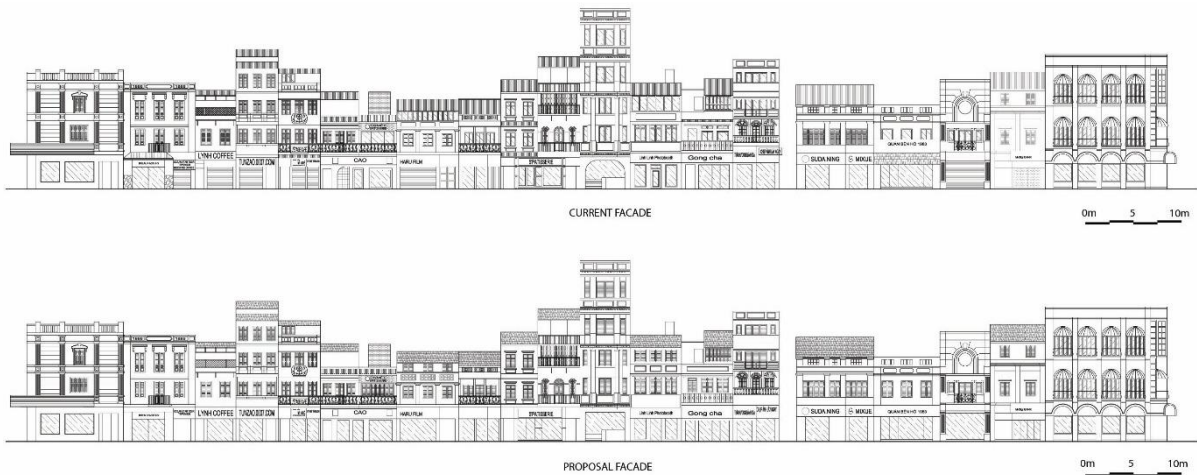


Figure 8. Current façade and proposal façade of Hang Khay Street. Drawn by authors

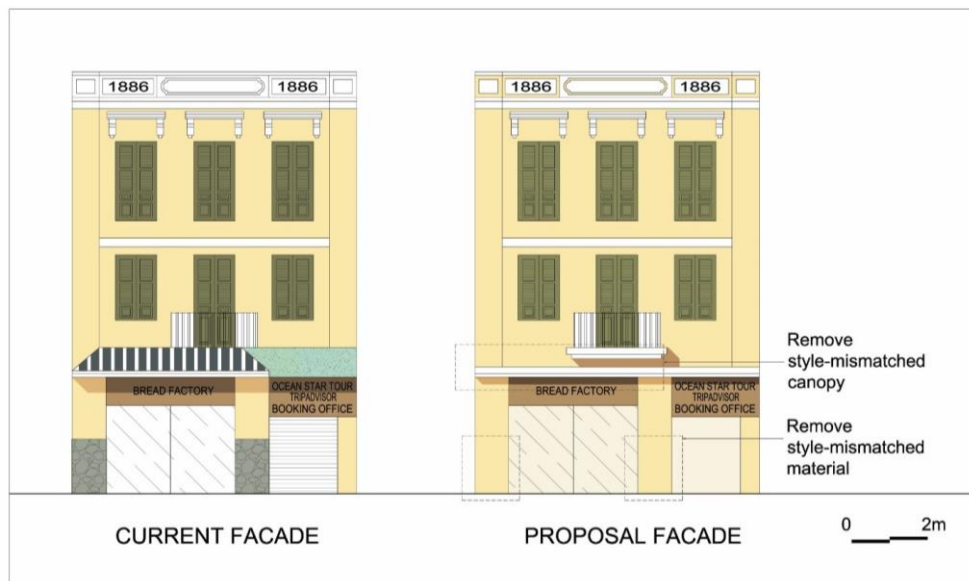


Figure 9. Proposal for house No. 3. Drawn by authors



Figure 10. Proposal for house No. 11. Drawn by authors



Figure 11. Proposal for house No. 13. Drawn by authors

7. Discussion

7.1. Comparison with Existing and International Models

The conservation and development model for Ho àn Kiém Lake adopts an integrated approach, combining heritage preservation, urban infrastructure upgrading, and the promotion of contemporary uses. Compared to the fragmented management practices in Hanoi, this model emphasizes local identity and community participation, shifting from a “static preservation” approach to one of “adaptive conservation.”

At the international level, the model shares many

similarities with UNESCO’s Historic Urban Landscape (HUL) framework (2011), which has been applied in George Town, Kyoto, and Seoul]. These international cases illustrate different emphases within the same HUL foundation: George Town prioritizes commercial–port functions; Kyoto focuses on religious and landscape values; while Insadong (Seoul) highlights community-based planning tools. By contrast, Ho àn Kiém Lake is distinctive for its “multi-layered” character—simultaneously marked by colonial architecture, indigenous spiritual spaces, and the pressures of modern commerce and services.

From this comparison, three key lessons emerge: (i) cross-sectoral governance is essential for multi-layered heritage; (ii) community participation is crucial for reconciling conservation, commerce, and cultural life; (iii)

management models must be “dynamically adaptive,” flexible in the face of development pressures.

These comparisons indicate that the HUL framework is contextually adaptable, though international studies often emphasize a single value layer (commerce, religion, or community planning). The case of Hồ àn Kiếm Lake adds a different perspective: heritage management under “multi-layered” conditions, where colonial, spiritual, and contemporary commercial values intersect. This constitutes an important academic contribution, as it not only mediates between diverse values but also expands HUL into a more “dynamically adaptive” management tool suited to culturally layered Asian cities.

7.2. Practical Applicability

The above international comparisons (Section 7.1) show that successful models combine heritage conservation, urban development, and community participation, lessons highly relevant to Hồ àn Kiếm Lake.

With supportive legal frameworks, upgraded infrastructure, and active community involvement, Hồ àn Kiếm provides a prime case for testing an integrated conservation, development model. Recent initiatives, zoning approval, expanded pedestrian areas, and metro planning, demonstrate the potential to link heritage with modern infrastructure, advancing urban heritage governance through cross-sectoral management, community participation, and adaptive approaches.

From this foundation, the model may be extended to other heritage cities in Vietnam, including Hoi An, Hue, Da Lat, and the old quarter of Ho Chi Minh City. Such extension, however, does not entail mechanical replication but rather requires flexible adaptation to local specificities. This reinforces the claim that the model possesses both universal significance and contextual adaptability in the dynamics of rapid urbanization.

7.3. Limitations and Implementation Requirements

Despite its advantages, some limitations remain:

- **Institutional:** There is currently no effective coordination mechanism among agencies managing culture, planning, infrastructure, and tourism. The lack of an interdisciplinary governance system leads to fragmentation in decision-making and the implementation of integrated conservation–development solutions.
- **Technical:** Sectoral data remain dispersed, inconsistent, and infrequently updated, complicating the assessment of current conditions, risk identification, and appropriate intervention—especially in fields such as architectural conservation, traffic organization, and tourism management.
- **Social:** Community participation in planning and conservation processes is still limited, often passive

or mobilized only after decisions are made. Moreover, prevailing perceptions of heritage tend to be static, viewing heritage as an immutable entity rather than as a living, adaptable space. This creates barriers to promoting flexible conservation models such as adaptive reuse and public space renovation.

Successful implementation requires: (i) a legal framework supporting integrated urban heritage approaches; (ii) spatial analysis tools and heritage impact assessment mechanisms; (iii) flexible financial and operational systems that combine state, private, and community resources.

8. Conclusions

Research has shown that the spatial configuration of Hoan Kiem Lake is the outcome of a long process of transformation shaped by the interplay of historical, political, cultural, and urban planning factors. By synthesizing historical maps, conducting field surveys, and analyzing secondary academic sources, the study identifies key phases in this spatial restructuring: from a spiritual–political center in the feudal era, to an administrative–commercial hub during the colonial period, and today a multifunctional public space of high symbolic value.

The planning–conservation model proposed in this study is not only a practical solution for Hoan Kiem Lake but also contributes to advancing knowledge in the field of urban heritage conservation. It emphasizes the need for an integrated approach that combines preservation with sustainable development, highlights the central role of urban identity and community, and underscores the importance of cross-sectoral governance mechanisms. In doing so, the research provides a valuable theoretical framework of reference for heritage cities facing modernization pressures in Vietnam and other developing countries.

Nevertheless, effective implementation of this model requires support from a flexible legal framework, comprehensive interdisciplinary data systems, and coordination mechanisms among stakeholders. Hoan Kiem Lake thus has the potential to serve as a representative pilot model—demonstrating not only a new approach within Vietnam but also contributing to the international discourse on urban heritage conservation strategies in the context of rapid urbanization and global integration.

Acknowledgments

This research is part of the project “Solutions for Sustainable Spatial Development of Hanoi’s Historic Urban Area,” code B2025-MHN-03, funded by the Ministry of Education and Training of Vietnam. We would like to express our sincere gratitude to Hanoi Open

University for providing an enabling working environment and facilities that have greatly supported the completion of this study.

REFERENCES

- [1] Ánh, T. H., "Năm thách thức trong quy hoạch, tổ chức giao thông và thiết kế đô thị chung quanh Hồ Gươm [Five challenges in planning, organizing traffic, and urban design around Hoan Kiem Lake]", 2025, <https://www.tapchikientruc.com.vn/chuyen-muc/nam-thach-thuc-trong-quy-hoach-to-chuc-giao-thong-va-thiet-ke-do-thi-chung-quanh-ho-guom.html>
- [2] Ashworth, G., "Preservation, Conservation and Heritage: Approaches to the Past in the Present through the Built Environment", *Asian Anthropology*, vol. 10, no. 1, pp. 1–18, 2011, DOI: 10.1080/1683478x.2011.10552601.
- [3] Bandarin, F. & R. Van Oers, "The Historic Urban Landscape: Managing Heritage in an Urban Century", Wiley, 2012, DOI: 10.1002/9781119968115.
- [4] Plevoets, B. & K. V. Cleempoel, "Adaptive reuse as an emerging discipline: an historic survey", *Reinventing architecture and interiors: a socio-political view on building adaptation*, Libri Publishing, Faringdon, 13–32, 2013.
- [5] Jamme, H.-T. W. & F. Ortega, "Modern infrastructure and historic urban landscape", *Routledge Companion to Global Heritage Conservation*, Routledge, New York: Routledge, 2019., 279–297, 2019, DOI: 10.4324/9781315659060-22.
- [6] Kashihara, S., "Incorporating Dynamic Intangible Elements in Urban Heritage Conservation The Development of Conservation Framework for Hanoi's Ancient Quarter, Vietnam", University of Architecture of Ho Chi Minh City, 2018.
- [7] Nghiêm Đ. N., "Thực trạng và thách thức về Không gian Kiến trúc – Cảnh quan khu vực Hồ Gươm [Current status and challenges of Architectural Space - Landscape of Hoan Kiem Lake area]", *Tạp chí Kiến trúc [Journal of Architecture]*, no. 11, pp. 22–27, 2014.
- [8] Unesco, "Recommendation on the historic urban landscape", 2011, https://unesco.org.uk/site/assets/files/1901/recommendation_on_the_historic_urban_landscape.pdf
- [9] Lanz, F. & J. Pendlebury, "Adaptive reuse: a critical review", *The Journal of Architecture*, vol. 27, no. 2–3, pp. 441–462, 2022, DOI: 10.1080/13602365.2022.2105381.
- [10] Langston, C. & L.-Y. Shen, "Application of the adaptive reuse potential model in Hong Kong: A case study of Lui Seng Chun", *International Journal of Strategic Property Management*, vol. 11, no. 4, pp. 193–207, 2007, DOI: 10.1080/1648715X.2007.9637569.
- [11] Qu ân, L., "Không gian kiến trúc cảnh quan hồ Hoàn Kiếm – Biểu tượng Văn hóa Lịch sử nhận diện đô thị Hà Nội [Architectural and Landscape Space of Hoan Kiem Lake – A Cultural and Historical Symbol Identifying the Urban Identity of Hanoi]", *Tạp chí Kiến trúc [Journal of Architecture]*, no. 9, pp. 25–29, 2014,
- [12] Hung, K. T. & Đ. H. Vũ, "Đặc điểm, tiềm năng và định hướng bảo tồn không gian Hồ Gươm trong sự phát triển tiếp nối [Characteristics, potential and orientation for conservation of Sword Lake's space in continuing development]", *Tạp chí Xây dựng [Journal of Construction]*, no. 10, pp. 125–131, 2023.
- [13] Duy, N. K., "Hồ Gươm cần trở thành một không gian như thế nào? [What type of space should Hoan Kiem Lake should become?]", 2014, <https://www.tapchikientruc.com.vn/tap-chi-kien-truc/tap-chi-kien-truc-09-2014.html>
- [14] Waibel, M., "The Ancient Quarter of Hanoi - A Reflection of Urban Transition Processes", *ASIEN*, no. 92, pp. 30–48, 2004.
- [15] Kashihara, S. & C. Q. Le, "Capturing the transition of historic urban landscapes using scores from Hanoi's ancient quarter", *Journal of Asian Architecture and Building Engineering*, pp. 1–16, 2024, DOI: 10.1080/13467581.2024.2422080.
- [16] Shibayama, M., "Hanoi's Urban Transformation in the 19th and 20th Centuries: An Area Informatics Approach", *Southeast Asian Studies*, vol. 36, no. 4, pp. 496–518, 2009, DOI: 10.20495/tak.46.4_496.
- [17] Ren, X. T. H. L. Le & T. T. Doan, "The Resignification of the Garden Suburb as International Heritage.", *International Planning History Society Proceedings*, vol. 20, no. 1, pp. 1431–1446, 2024, DOI: 10.7480/IPHS.2024.1.7658.
- [18] Pham, T.-T.-H. & D. Labbé "Spatial Logic and the Distribution of Open and Green Public Spaces in Hanoi: Planning in a Dense and Rapidly Changing City", *Urban Policy and Research*, vol. 36, no. 2, pp. 168–185, 2018, DOI: 10.1080/08111146.2017.1295936.
- [19] Pham, T. N. L., "Real estate prices in Hanoi pedestrian streets", *E3S Web of Conferences*, vol. 403, pp. 01003, 2023, DOI: 10.1051/e3sconf/202340301003.
- [20] Hùng P., "Hồ Gươm – Hệ sinh thái đô thị cần được bảo tồn trong quy hoạch di sản [Hoan Kiem Lake – An urban ecosystem that needs to be preserved in heritage-based planning]", 2025, <https://tapchivietnamhuongsac.vn/ho-guom-he-sinh-thai-do-thi-can-duoc-bao-ton-trong-quy-hoach-di-san-1088.html>
- [21] Le, M. T. T. A. T. Cao & N. A. Q. Tran, "The role of green space in the urbanization of Hanoi city", *E3S Web of Conferences*, vol. 97, pp. 01013, 2019, DOI: 10.1051/e3sconf/20199701013.
- [22] Nguyen, T. H. L., "Influences of Cultures on Open Space Planning for Hanoi City of Vietnam", *VNU Journal of Science: Earth and Environmental Sciences*, vol. 30, no. 2, pp. 15–29, 2014.
- [23] Thomas, M., "Out of Control: Emergent Cultural Landscapes and Political Change in Urban Vietnam", *Urban Studies*, vol. 39, no. 9, pp. 1611–1624, 2002, DOI: 10.1080/00420980220151682.
- [24] Scheiber, L. V. Zühlsdorff N. T. Son N. H. Duong N. H. Quan M. Garschagen & A. Reimuth, "Comparing the distribution and development of Urban Green Spaces in the two Vietnamese delta cities Hanoi and Ho Chi Minh City", Available at, <https://meetingorganizer.copernicus.org/EGU24/EGU24-4099.html>

- [25] Loi, D. T. & P. T. Duong, "The integrated model development for assessing urban green space quality. A case study in Hanoi inner city, Vietnam.", *GeoJournal of Tourism and Geosites*, vol. 43, no. 3, pp. 912–918, 2022, DOI: 10.30892/gtg.43310-904.
- [26] United Nation, "Transforming our world: The 2030 agenda for sustainable development", 2015, <https://docs.un.org/en/A/RES/70/1>
- [27] Sachs, J. & G. mun Ban, "The age of sustainable development", Columbia University Press, New York, 2015.
- [28] Guy, S. & G. Farmer, "Reinterpreting Sustainable Architecture: The Place of Technology", *Journal of Architectural Education*, vol. 54, no. 3, pp. 140–148, 2001.
- [29] Rapoport, A., "Attributes of tradition", *Dwellings, settlements, and tradition: cross-cultural perspectives*, University Press of America; International Association for the Study of Traditional Environments, Lanham: Berkeley, CA, 77–105, 1989.
- [30] Oliver, P., "Dwellings: the vernacular house worldwide", Phaidon, London, 2007.
- [31] Relph, E. C., "Place and placelessness", Pion, London, 2008.
- [32] Norberg-Schulz, C., "Genius loci: towards a phenomenology of architecture", Rizzoli, New York, 1984.
- [33] Plevoets, B. & K. V. Cleempoel, "Adaptive reuse as a strategy towards conservation of cultural heritage: a literature review", *WIT Transactions on The Built Environment*, WIT Press, 155–164, 2011, DOI: 10.2495/str110131.
- [34] Bullen, P. A. & P. E. D. Love, "Adaptive reuse of heritage buildings", *Structural Survey*, vol. 29, no. 5, pp. 411–421, 2011, DOI: 10.1108/02630801111182439.
- [35] National Assembly of the Socialist Republic of Vietnam, "Law on Cultural Heritage", 2024, <https://english.luatvietnam.vn/van-hoa/law-on-cultural-heritage-no-45-2024-qh15-379068-d1.html>
- [36] Prime Minister of the Socialist Republic of Vietnam, "Master plan for Hanoi Capital construction to 2030 with a vision to 2050", 2011, <https://vanban.chinhphu.vn/default.aspx?pageid=27160&docid=101900>
- [37] People Committee of Hanoi, "Approval of the H1-1B urban zoning plan (Hoan Kiem Lake area and surrounding areas)", 2021, https://qhkt.hanoi.gov.vn/cong-bo-quy-hoach/-/asset_publisher/lhsnzm6sAin/content/hoi-nghi-cong-bo-cac-o-an-quy-hoach-phan-khu-o-thi-h1-1a-h1-1b-h1-1c-h1-2-h1-3-h1-4-ty-le-1-2000
- [38] Nguyen, T. H. V. H. Dang & T. Y. Nguyen, "Thực trạng và đề xuất giải pháp bảo tồn, phát triển cây xanh đường phố quận Hoàn Kiếm, thành phố Hà Nội [Current status and proposed solutions for preserving and developing street trees in Hoan Kiem district, Hanoi city]", *Tạp chí Khoa học và Công nghệ Lâm nghiệp [Journal of Forestry Science and Technology]*, no. 1, pp. 17–25, 2017,
- [39] Ho, S. Q., "Hanoi identity and the influence of French culture and civilization", *Journal of Social Sciences Information Review*, vol. 17, no. 2, 2024, <https://vjol.info.vn/index.php/ssirev/article/download/101767/85822/>
- [40] Lynch, K., "The image of the city", M.I.T. Press, Cambridge, Mass., 2008.