

Advances in Science, Technology & Innovation
IEREK Interdisciplinary Series for Sustainable Development

Tarek Teba · Antonino Di Raimo
Editors

Conservation of Architectural and Urban Heritage

Indigenous and Global Sustainable Practices

Advances in Science, Technology & Innovation


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Tarek Teba • Antonino Di Raimo
Editors

Conservation of Architectural and Urban Heritage

Indigenous and Global Sustainable Practices

 Springer

Editors

Tarek Teba
Associate Professor in Architectural Heritage
University of Portsmouth
Portsmouth, UK

Antonino Di Raimo
Associate professor in Architecture
University of Portsmouth
Portsmouth, UK

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Preface

The importance of conserving architectural heritage cannot be exaggerated. Built heritage serves as a tangible link to humanity's past, reflecting the cultural, historical, and artistic expressions of generations before us. It tells the stories of communities, civilizations, and their evolution over time. By preserving these architectural treasures, humans not only retain a physical reminder of their shared history but also provide future generations with a source of inspiration and understanding. The conservation of architectural heritage promotes a sense of identity, pride, and belonging, strengthening the cultural fabric and enriching the collective memory. In addition to the points stated above, these heritage sites often have economic value, attracting tourists, supporting local economies, and contributing to sustainable development. By investing in the conservation of architectural heritage, humans invest in the preservation of their collective heritage and ensure its continued relevance and significance for generations to come. In this preface, the aim is to provide a glimpse into the significance of architectural heritage conservation and the valuable contributions made by the contributors of this book.

As time passes and societies evolve, architectural heritage faces numerous threats, including neglect, natural disasters, urbanization, and even armed conflicts. To counter these challenges and ensure the preservation of built heritage for future generations, the field of architectural heritage conservation has emerged as a pivotal development.

This book, *Conservation of Architecture and Urban Heritage: Indigenous and Global Sustainable Practices*, is a platform for the exchange of knowledge, ideas, and best practices in this constantly evolving field. The conference proceedings presented in this book showcase the latest research, case studies, and innovative approaches employed by experts from various disciplines, including architecture, archaeology, conservation science, urban planning, and heritage management.

This book is split into five sections, and within these pages, you will find a fortune of insights, strategies, and methodologies that shed light on the multifaceted nature of architectural heritage conservation. From the meticulous documentation and assessment of historic structures to the development of sustainable conservation methodologies, each chapter discusses the challenges faced by conservation professionals and offers practical solutions.

Furthermore, this collection of conference proceedings and the best papers submitted to the conference not only highlights the technical aspects of architectural heritage conservation but also emphasizes the social, economic, and cultural dimensions inherent in this field. By exploring the intricate relationship between built heritage and the communities it serves, these proceedings underline the importance of engaging local stakeholders, fostering public awareness, and promoting responsible tourism as essential components of successful conservation efforts.

Heartfelt gratitude is extended to all the contributors who have shared their expertise, experiences, and passion for architectural heritage conservation in this book. Their dedication and commitment to preserving humanity's shared architectural legacy are truly commendable, and the hope is that their contributions inspire readers to actively participate in protecting heritage for future generations.

Sincere appreciation is also expressed to the organizers of the conference that gave birth to this publication, providing a platform for discussion, networking, and the exchange of ideas.

Without their vision and hard work, this collection of conference proceedings would not have been possible.

In closing, enjoy and immerse yourself in the different perspectives and invaluable knowledge found within the pages of *Conservation of Architecture and Urban Heritage: Indigenous and Global Sustainable Practices*. Let's safeguard architectural heritage, ensuring that the stories embedded within these structures continue to inspire, educate, and connect us to the past.

Enjoy this collection of the best papers submitted to the conference, and may it encourage and call for the preservation and appreciation of architectural heritage.

Portsmouth, UK

Tarek Teba
Antonino Di Raimo

Introduction

The importance of cultural heritage within the Sustainable Development Goals (SDG) Agenda 2030 has gained increasing recognition in recent years. While SDG 11 is dedicated to making “cities and human settlements inclusive, safe, resilient, and sustainable,” target 11.4 aims to “strengthen efforts to protect and safeguard the world’s cultural and natural heritage.” Consequently, the emphasis within this target has expanded to acknowledge both the cultural and natural dimensions of heritage.

Within the built environment, architectural heritage comprises the tangible remains of human civilization, embodying cultural identities, historical narratives, and both latent and active societal values. However, architectural heritage extends beyond individual buildings; contemporary studies and practices have broadened its definitions to include natural and urban landscapes, historic districts, and the cultural values underpinning them. Beyond their physical dimensions, sites with significant heritage value encapsulate layers of human history and cultural evolution. They can offer essential insights to shape contemporary socio-economic, political, and environmental policies and practices across diverse geographical contexts.

This book focuses on acknowledging the complexity of these values. It aims to broaden the discussion around cultural heritage and highlight its connection with sustainability. Additionally, the book seeks to present an overview of diverse voices emerging within contemporary heritage investigations. We aim to contribute additional layers of knowledge about the notion of heritage and its interpretations from various geographical contexts, emphasizing its meaningful connections with the broader umbrella of sustainability.

The book also underscores that the preservation of architectural and urban heritage—perhaps now more than ever—requires a multidisciplinary approach, both in analytical practices and in design and preservation proposals. It encompasses traditional architectural conservation and historical research and extends to include community engagement. Many contributions within this book significantly emphasize the need to integrate local communities into heritage contemporary practices. Heritage should be recognized and acknowledged not only by professionals but primarily by the communities who experience it daily.

While preserving historical and cultural heritage sites is crucial for maintaining a sense of identity and continuity, it is equally important to address the needs and aspirations of the communities involved and to recognize heritage as a shared value. Thus, this book also explores how conservation efforts are increasingly seeking to balance heritage preservation with community needs. Heritage and sustainable development play a vital role in fostering and maintaining societal cohesion. Various examples presented in this book clearly demonstrate that heritage and conservation practices no longer occur in isolation. Recognizing inhabitants not merely as spectators, but as active participants and creators of local narratives, is transforming the concept of heritage into a shared practice among diverse stakeholders.

One of the key challenges in balancing heritage conservation with community considerations lies in navigating competing interests and priorities. Striking a balance between economic development, infrastructure improvements, or social services and preserving the authenticity and integrity of historical sites is often one of the most important narratives underscored by many of the experiences presented in this book.

Engaging the community in the decision-making process is essential to ensure that conservation efforts are inclusive and sustainable. Some of the works highlighted in the book illustrate how participatory processes, including public forums and community workshops, provide avenues for residents to voice their opinions, share their knowledge, and contribute to shaping the future of their neighborhoods. By fostering a sense of ownership among community members, these conservation initiatives gain broader support and foster a deeper appreciation for heritage assets. Moreover, integrating heritage conservation with community development offers multifaceted benefits. Preservation projects act as catalysts for economic revitalization, tourism promotion, and cultural enrichment, generating employment opportunities, fostering local pride, and enhancing the quality of life.

The social, economic, and environmental dimensions, underpinned by the notion of sustainability, are increasingly pivotal in promoting architecture and urban heritage to regenerate contexts and support local economies. In this regard, the adaptive reuse of historic buildings can promote sustainable actions by reducing carbon emissions and minimizing waste generation. Energy efficiency, indoor environmental quality, and ecological impacts are now integral to every operation driven by retrofitting in adaptive reuse.

However, conservation efforts face several challenges, including inadequate funding, lack of public awareness, insufficient legal protection, and conflicting interests between development and preservation. The preservation of cultural and natural heritage is a growing concern amid rapid globalization, urbanization, climate change, and socio-political shifts. As societies strive to maintain connections with their past while fostering sustainable development, they encounter numerous challenges that demand innovative solutions. Key global challenges in heritage and conservation are driving the adoption of interdisciplinary approaches. Trends indicate that interdisciplinarity can significantly contribute to devising new ways of preserving and regenerating heritage. These key global challenges can be summarized as follows:

- **Urbanization and Human Issues:** Rapid urbanization, industrialization, and globalization present significant threats to cultural heritage sites and practices. Urban development projects frequently encroach upon historic neighborhoods, while globalization can lead to the homogenization of cultural identities. Additionally, natural disasters, armed conflicts, and political unrest endanger heritage sites, as observed in recent conflicts.
- **Environmental Challenges:** Climate change poses profound challenges to the preservation of natural and cultural heritage assets. Rising sea levels, extreme weather events, and shifting ecosystems threaten iconic landmarks and cities. Moreover, environmental degradation, pollution, and habitat loss compromise the integrity of cultural landscapes and archaeological sites.
- **Economic Pressures and Disbalances:** Heritage conservation often competes with economic interests, as governments and developers prioritize infrastructure projects and tourism development over preservation efforts. Limited funding and resources further exacerbate this challenge, particularly in developing countries where heritage sites are abundant but resources are scarce.
- **Political and Social Context:** The protection of heritage is entangled with political agendas, social dynamics, and power conflicts within and between nations. Conflicting interpretations of history and contested identities can impede international cooperation and dialogue on heritage conservation. Moreover, Indigenous communities often face marginalization and displacement due to heritage policies that prioritize top-down approaches and narratives.

This book presents a varied collection of potential approaches to contemporary challenges. Through five sections, authors from diverse backgrounds, cultural narratives, and areas of expertise present their approaches to analyzing, conceptualizing, and developing heritage solutions and strategies. Here, the notion of heritage not only embraces diverse aspects of

sustainability at both theoretical and applied levels but also integrates sustainability within a heritage perspective.

Part I, “Extending the Heritage Discourse: Unprecedented Urban and Landscape Geographies and Communities,” proposes an overview of geographies where heritage practices and discourses develop operative perspectives rooted in the notion of territory rather than individual heritage sites.

Part II, “Intersecting Techniques: Analogue and Digital Approaches for the Documentation of Heritage,” emphasizes the need to integrate digital technologies while maintaining analog approaches in heritage documentation.

Part III, “Heritage Reuse, Adaptation, and Regeneration Practices,” showcases experiences in adaptive reuse, demonstrating its viability for sustainable heritage.

Part IV, “Sustainable Conservation and Management of Heritage,” highlights protocols and methods tailored to the uniqueness of each case study.

Finally, Part V, “Examining Heritage: Sustainable Technologies,” presents current technological developments at the level of materials, conservation, and/or analysis techniques.

The book, along with the individual chapters, also emerges as an account of experiences and contexts not normally part of the heritage discourse. It illustrates how contemporary heritage is becoming increasingly inclusive and embedded in the daily lives of diverse communities. Ultimately, if heritage conservation is to become sustainable, sustainability must also evolve into a historical practice.

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Part I

**Extending the Heritage Discourse:
Unprecedented Urban and Landscape
Geographies and Communities**



Urban Heritage Role in Post-War City: Revitalizing the Routes of “Sufi Rituals” in the Syrian City of Homs

Racha Taiyara and Abeer Abdelal

Abstract

Facing various crises, both acute and chronic, seems to be a natural part of the formation and development of cities. The continuous adaptation record constitutes a specific character that distinguishes each city, reflexed by combining its physical form with the culture and behavior of its inhabitants, which is its urban heritage that will be sculpted repeatedly as long as life goes on.

Wars are among the strongest challenges that threaten the urban entity physically and functionally. In Homs city, which has suffered a considerable share of destruction and casualties due to war in Syria, considering the current stifling economic crisis, reviving urban heritage emerges as a need to be provided.

Historically, simplicity was Homs dominant feature, and its residents devised their own means to express their relation to the place. They adopted a unique celebration, the Thursday of Sufi orders' leaders “*Khamis al-Mashaykh*,” as an annual event that ignites enthusiasm in the city's residents and visitors alike. This paper proceeds from this historical point, documents the routes of Sufi celebration, links its rituals with the Old City's urban geography, draws its routes, and defines its important landmarks, relying on historical references and interviews with specialists and eyewitnesses.

Keywords

Post-War City · Urban heritage · Sufi routes · Homs · Khamis al-Mashaykh

1 Introduction

Homs is a Syrian city distinguished by several characteristics that made it an inhabited residence for more than 2000 years. Over time, it faced many natural and man-made disasters, but it has always maintained a simple way of life, which is clearly reflected in the facades of its urban fabric, devoid of decoration, and in its interconnected streets and squares, without any iconic or lavish landmarks.

With the rapid expansion of Homs in the last century, its old part suffered from neglect. Then the war erupted and caused the city to lose a great deal of its tangible and intangible heritage, which distinguishes it from other Syrian cities. Many efforts were exerted to preserve and revive the remaining of the city's historical heritage, but they were superficial in dealing with the cultural context of this heritage, in addition to the lack of historical sources and studies that dealt with documenting it. All these factors threaten the loss of the local heritage identity at various cultural, social, and urban levels.

The network of urban routes of the Sufi orders is an important material component of the cultural and spiritual heritage of Homs city, and a strongly present element in the collective memory of its people. The cessation of its celebration in Homs, around the middle of the last century, had a negative role in declining its importance. Building destruction and people displacement caused by the war in this city, especially its old part, has an added effect that exposes this cultural component to the risk of deterioration and extinction. Therefore, conducting an urban study of the Sufi orders routes of the great Sufi celebration event known as “*Khamis al-Mashaykh*” in Homs, and documenting its geography and

R. Taiyara (✉)
Vice Dean—Faculty of Architecture and Urban Planning,
Al-Wataniya Private University, Hama, Syria
e-mail: racha.taiyara@wpu.edu.sy

A. Abdelal
Technical staff member—Faculty of Architecture and Urban
Planning, Al-Wataniya Private University, Hama, Syria
e-mail: abeer.abdalaal@wpu.edu.sy

its current situation, is an important effort to preserve this valuable cultural heritage, as a distinguished event in the life and memory of the city; an annual ritual, spiritual and social, that unites the city and supports its economy. Indeed, this event used to attract thousands of people who flocked from the cities and countryside of Syria and from the Levant and Egypt, from the late eighteenth century until the middle of the twentieth century.

2 Problem Statement

The loss of the tangible elements associated with Sufi thought in the city, and the scarcity of literature explaining its details confirm the real need to tackle such context that could be summarized as follows:

- Lack of references and studies on the history of Homs city in general, and on the routes of the processions of *Khamis al-Mashaykh* in particular.
- The deterioration and loss of some historical and cultural monuments associated with the routes of Sufi processions, in addition to the poor infrastructure conditions of the paths, as a result of time obsolescence, environmental factors, inappropriate human activity, and urban changes that are inconsistent with the privacy of the Old City, and then the war.
- The gradual complete loss of Sufi processions routes and *zawiyas* (Sufi orders communities) locations within the urban fabric of the Old City, and their impact on the development of the city. Noticeable demographic changes that occurred in the city before and after the war changed the perception of the local population and their knowledge of the story of their place, especially regarding the importance of the cultural and spiritual heritage of the Sufi routes as part of the city's heritage.
- Increased challenges related to balance preserving the historical and cultural heritage, meeting the urgent needs of local communities, and promoting sustainable development, because of the acute and exacerbating economic problem created by the post-war complexities.
- Heritage documenting and revival projects are generally not given priority considering post-war conditions, whether by city administrations or by the concerned international bodies, especially in sites that are not registered in the list of World Heritage Sites, which exacerbates difficulties in securing essential financing for studies and related projects.

3 Study Aim

The research aims to study the routes of the Sufi orders in Homs city from various aspects, historical, architectural, urban, social, cultural, spiritual, and economic, focusing on the following:

- Identifying and documenting the historical buildings and all the *zawiyas* and shrines that link the paths of the Sufi processions inside and outside the Old City and reflecting them on plans showing an integrated network of routes and vital points.
- Comparing these traditional paths with the current urban network of the city.
- Drawing the urban features of the local culture of Homs during a specific time period, shedding light on elements that can be employed in the future to enhance local, regional, or international tourism aspects.
- Acknowledging the role of urban routes of the Sufi orders in forming the cultural and historical heritage of Homs.

4 Methodology

Homs Old City and its intangible heritage were not among the concerns of the heritage authorities in Syria. Most studies related to this type of heritage focused on the old cities of Damascus and Aleppo, so it was difficult to obtain any drawn documents such as plans indicating the locations of Sufi procession routes and *zawiyas* within the urban geography of the Old City. The historical sources to which the research resorted, dealt with the main routes of Sufi processions without addressing the exact locations of the *zawiyas* and individual routes of the processions of each Sufi order, and the directions of their movement.

Therefore, to fill these gaps and link the rituals with their places according to their time schedule, the research relied on conducting interviews with specialists from historical associations in Homs to ensure the accuracy of the locations related to this annual event. Some architectural features have been changed or no longer exist today as a result of the urban changes that have occurred.

In addition, the field visits and interviews conducted within the Old City, with those who still live near the *zawiyas* sites or experienced the events of some seasons during their childhood, contributed to knowing the current status of the paths, the remaining *zawiyas*, their current functions and

their accurate locations on the plans. The work methodology can be summarized as follows:

- Comparing the available historical sources and studies related to the focused event “*Khamis al-Mashaykh*” in Homs city.
- Benefit from the archive of the official departments concerned with heritage in Homs, interviewing some of their officials.
- Interviews with members of historical associations and discussions with local researchers who witnessed the last celebrations.
- Field tours inside and outside the Old City to trace routes, *zawiyas*, shrines, and historical buildings associated with these routes, including interviews with the local residents there.

5 Literature Review

Sufism is a spiritual aspect of Islam that focuses on direct personal experiences of God and includes various mystical paths to reveal the truth of divine love, knowledge, and wisdom. It emerged in religious circles as a reaction against the worldliness of the early Umayyad period (661–749), and its orders began to take shape in the twelfth century and flourished in the thirteenth century (Schimmel 2023).

Sufism has a strong potential in all countries of Central Asia. Studies highlight that the tolerant nature of Sufism attracts a diverse range of individuals from different religious affiliations, leading to a significant increase in tourist visits to Sufi holy sites worldwide over the past decade.

Various religions have been utilized to promote spiritual tourism, such as Catholicism for the Vatican, Hinduism for the Ganges and Indian Temples and Ashrams, and Islam for Mecca and Sufi Shrines (Badar and Chakradeo 2016).

Religiously or spiritually motivated travel has gained popularity in recent decades, and thus, it constitutes a significant part of global tourism nowadays (Bouyahya 2016). Religious rituals can support community-based tourism initiatives, even when tourists may not be overtly religious (Rashid 2018).

The relationship between Sufism and tourism offers mutual benefits through heritage site promotion, authentic sacred experiences, and the potential for economic growth in the hosting community (Badar and Chakradeo 2016).

Consequently, most studies that deal with Sufism focus on its meaning, history, thought, practice, and orders. Some studies are interested in linking Sufi or religious sites and routes to tourism activity as an economic resource, more than promoting of sites’ local identity (Abaza et al. 2022).

There are no specific studies that deal with the concept of reviving the Sufi routes in Syria. Most researchers focused on the Sufi practices themselves.

Regarding *Khamis al-Mashaykh* in Homs, available studies focused on the historical aspects, such as the emergence, development of festive ceremonies, organizational processes that arrange the sequence of processions, numbers of groups, traditions, fashion, chants, musical tools, traditional weapons, and others. However, urban paths as a network were not noticed sufficiently to determine accurate locations of the Sufi *zawiyas* and to depict a clear and integrated map of Sufi procession routes on various celebration days.

A single attempt was made by a French researcher (Gillon 1997) to draw a part of these routes in and around the city without a detailed study that links Sufi *zawiyas*, paths, and shrines that formed main points of the whole event as tangible elements with groups of believers, leaders, and audience as intangible elements.

6 Homs City

Homs city is characterized by its strategic location, gentle climate, and abundance of agricultural lands in its vicinity, which made it a residence for a variety of people from the twenty-third century B. C. (Asaad 1983). Homs is located on an important trade node, linking the eastern part (semi-desert region) in Syria to its western part (eastern coast of the Mediterranean), and the northern part, including Aleppo, with Damascus in the southern part (Asaad 1984).

The spiritual importance of the city increased after the Islamic conquest because the number of shrines of the Companions who were martyred or chose to stay in Homs was the largest among the other Levantine cities (Sheikhani 2011). The city benefited from annual pilgrims Caravans coming from all northern cities heading to Damascus, as they intended to reach the *Hijaz* region (currently Saudi Arabia) in *Al-Hajj* and *Al-Umrah*, the most important Islamic rituals (Al-Nabelsi 1715/1989).

On the social level, the residents of Homs consist of different origins and religions and mostly include middle and low-income levels. The city was not attractive to great merchants, therefore life costs in it were reasonable, so it was named “Mother of the Poor.” It adopted a simple lifestyle that appeared in people’s behavior and the facades of their homes and public buildings. The presence of vast green spaces in the west of the city had a great impact on creating a cheerful, lively mood among the city’s residents. They loved poetry and singing and were famous for their sense of humor, making jokes about themselves, which they continue to do to this day.

Homs was exposed to long periods of instability due to regional conflicts. During the Crusades, a specific event was launched in the city of Jerusalem to announce the truce and celebrate peace. This event was called “Thursday of Jerusalem,” which was spread and adopted by many cities including Homs city.

The qualities that distinguished the residents of this city, such as simplicity, humility, and sincere passion for religion, may explain why this event was widely accepted, as they found in it a creative way to express their political position, religious affiliation, social identity, in addition to the economic benefit.

By that time, the Thursday of Jerusalem developed in Homs remarkably and became one of the most important celebrations in it. Its importance increased till the forties of the twentieth century, and it was strongly associated with the city’s cultural heritage, shared by residents and visitors alike, despite stopping celebrating it since the middle of the last century. (Hussein Agha 2019).

7 The Ancient Spring Festivals in Homs

A combination of geographical, climatic, and cultural factors led to Homs being characterized by a local calendar of annual rituals, some of which date back to ancient times.

Until the early fifties of the twentieth century, Homs city was the scene of the Spring Festival celebrations, which culminated in the famous Sufi processions that used to take place in the streets and suburbs of the city.

The spring festivals in Homs extended to seven consecutive Thursdays:

The first four: Thursday of the Lost “*al-Tayh*,” Thursday of the Neglected “*al-Shanuna*,” Thursday of the Crazy “*al-Majnuna*,” Thursday of the Cats (or animals); there were no popular celebrations left of these days in the second half of the nineteenth century, but they may have had its own celebrations in a different past.

The last three—Thursday of the Plants, Thursday of the Dead, and Thursday of Sufi orders’ leaders “*Khamis al-Mashaykh*”—remained days characterized by public mass rituals until the middle of the last century.

The Thursday of the Plants, also called Thursday of Citadel or Daughters, is an event that the ancient residents of the city linked to the Citadel, the highest topographical landmark in the southwest of the city. It was a route that passed through some of the pious shrines heading to the top of the Citadel, an act of closeness to God and an opportunity to pray and ask for wellness and provision.

Followed by the Thursday of the Dead (also called Thursday of Sweet “*al-Halawa*”), a date that was renewed every year to commemorate the dead, visit their graves, pray for them, and share away a specific kind of popular sweet.

All these Thursdays end with *Khamis al-Mashaykh*, also known as the Thursday of Jerusalem, or Thursday of Eggs, which is certainly the most important of all these occasions and the most expressive of the city’s culture, as it developed due to various reasons to become an annual event of great social and economic importance for both city’s residents and visitors.

These feasts start from February until April, including the period of the spring equinox, and the date of the Eastern Easter is used as a reference point to determine the specific time of these feasts. For some reason, these celebrations combined both Christian and Islamic calendars, as all the ritual calendars in the ancient Near East were lunar-solar (Al-Sibaai and Al-Zahrawi 1992; Gillon 1993/1997; Hussein Agha 2019; Safi 1983).

7.1 The Origin of *Khamis al-Mashaykh* or Thursday of Jerusalem

Khamis al-Mashaykh was certainly the most famous “Thursday” in Homs city. It became before Eastern Easter Day, and it was called in the Levant “Thursday of the Eggs.”

As the spring collective outings to the orchards near the city and the rural shrines have a long-established heritage in the Near East, it is possible that the Thursday of Jerusalem is a revival and adaptation of one of the ancient spring festivals, that is why Saladin considered that there was a benefit in renewing it (Gillon, 1993/1997; Hussein Agha 2019).

The Thursday of Jerusalem arose under the direction and arrangement of Saladin, after the truce in 1192 that allowed the Franks to visit Jerusalem and the Church of the Holy Sepulcher, and to celebrate the great Easter Day. Saladin adopted a political plan with a military appearance and a religious template to confront the Crusader gatherings during Easter celebrations. Thus, he encouraged ceremonial manifestations confirming the Islamic presence on the land of Jerusalem, and highlighting his military and moral strength, through Islamic ceremonial processions, in which knights marched with their weapons, flags, and *sanjaks* (banners), following certain ceremonial steps of their departure, march, and the reception of the *Sanjak* of *Al-Aqsa* Mosque before heading to visit the shrine of the Prophet Musa, about 28 km east of Jerusalem, as a symbol of a defensive position for the city (Al-Sibaai and Al-Zahrawi 1992; Gillon, 1993/1997; Hussein Agha 2019).

Ceremonies were mostly derived from the official Ayyubid military ceremonies, and these festive processions continued for a whole week. Later, these processions expanded and became active as a commemoration of victory in a religious nature, performed by the masters of the Sufi orders, with the participation of all classes of society in

Jerusalem and the neighboring cities and villages in the Levant and Egypt.

After the liberation of the whole country from the Crusaders, the participants transferred this festive image to their countries through the Sufi orders’ leaders, who participated in the whole process, so the event was re-celebrated in most of the cities and countryside of the Levant region (Hussein Agha 2019).

7.2 *Khamis al-Mashaykh* (Thursday of Jerusalem) in Homs

Historically, Homs city was not characterized by significant political or economic influence, as in Damascus or Aleppo, but its residents were characterized by moderate religiosity, as their beliefs were reflected in daily behavior and relationships with each other, and in the simple buildings that formed the urban fabric of their city. These factors were consistent with the principles of Sufi thought, which was a part of these behaviors that positively affected the cohesion of the city’s society and the revitalization of its economy. The Sufi community in Homs consisted of different orders, each order’s leader had his own *zawiya*, the place where he and his followers began their annual procession during the celebration of the “Thursday of Jerusalem.”

In the early years of this celebration in Homs, it was not a collective big event. The processions were simple, as they went out to visit specific shrines. Each order leader used to go out from his *zawiya* to a place of his choice outside the city as a religious and recreational outing, without being associated with another procession or intending to meet other groups. These celebrations were active in some years and weak in others, but they did not stop.

Since the end of the thirteenth century, the descendants of one of the Sufi leaders “*al-Abrini*” used to go out from *Bab Tadmor* (Palmyra Gate in the northeast of the city) to visit their grandfather’s shrine in a nearby village. At the end of the seventeenth century, the followers of another order, *al-Jandaliya al-Rifaiya*, started their ceremony from *Bab Al-Dreib* (southeast gate of the city) to visit one of the nearby shrines, the shrine of *al-Taiyar*’ sons. Then they expanded the journey geographically, visiting an important shrine “*Amro ibn Maad*” in the village of *Baba Amro* (southwest of Homs, which is currently one of the city quarters). On their return, they used to visit the shrine of *Khalid ibn al-Walid* in the village of *Al-Khalidiya* (north of Homs, which became also one of the city quarters).

At the beginning of the eighteenth century, some followers of the *al-Sadiya* order went out near the Orontes region, west of Homs, but the first documented gathering of all the city’s Sufi processions was in 1719 when they went together

to *Baba Amro* and to the shrine of *al-Taiyar* (Al-Zahrawi 2001; Gillon, 1993/1997; Hussein Agha 2019).

Gradually, new *zawiyas* emerged, founded by new Sufi orders’ leaders who came to the city, seeking to be part of the celebration processions (Hussein Agha 2019).

When the processions of the Thursday of Jerusalem became more organized and the Sufi leaders decided to gather in 1785, this day became known in the community of Homs city as “*Khamis al-Mashaykh*,” as a local expression that summarized the sequence of all Sufi processions marching proudly carrying their *sanjaks* and flags, adding their unique specific artistic features.

In order to increase the impact of the event, Sufi leaders in Homs linked the annual ceremony to other local religious symbols in the city. So, over time, this annual event has had a huge economic impact due to the huge numbers of visitors from other cities and countries participating in or watching the Sufi processions that cover the various parts of the city and its surroundings every year.

The processions of *Khamis al-Mashaykh* continued to take place in a regular sequence on Thursdays and Fridays, and the number of Sufi orders’ processions who joined them increased dramatically at the beginning of the twentieth century until the Sufi leaders stopped going out due to difficult circumstances of the First World War.

During the French mandate period (1920–1946), this celebration was banned. Then, French government representatives were laggard to give the Sufi processions approval to go out on Thursdays under many pretexts, including accidents arising from crowding and traffic chaos, so the Homs scout volunteered to arrange the march and maintain security in the city. After that, the processions returned to being organized and arranged as before, given that this occasion became the basis for the traditions of Homs city, in addition to its social and economic importance, so its reputation spread throughout the Levant (Hussein Agha 2019; Safi 1983).

The main reasons that contributed greatly to the continuation of the “Thursday of Jerusalem” celebration in Homs for several centuries and made it become the most important annual event witnessed by the city until the forties can be summarized as follows:

- Homs, like other cities in the region, gathered a diverse group of residents: Arabs, Kurds, Turkmen and Armenians, etc., and since the majority of them were Muslims when this event reached the city, celebrating the Thursday of Jerusalem had a great impact in uniting most of the city’s society in following Sufi thought and practice.
- Each Sufi leader belonged to an influential family that supported the continuation of their neighborhood procession.
- “*Khamis al-Mashaykh*” proved its economic importance to business owners in Homs, so it was a primary goal for

them to support its continuation, and they called it “the season” referring to the economic opportunity with the huge numbers of visitors coming from other cities and countryside to participate or attend this event that covered vital parts of the city and its surroundings every year.

7.3 Details of the Festive Ceremonies of *Khamis al-Mashaykh*

Wednesday, the Night Before

Although Thursday is designated for this celebration, preparations for its festive ceremonies officially used to begin on Wednesday (in fact it is preceded by several weeks of preparation by the people of the city).

On Wednesday, the Sufi leaders met their followers and other neighborhood participants in their *zawiyas* to set the final arrangements. Some representatives of the Sufi orders used to move out to the city’s main commercial square, *Bab al-Souk* (Market Gate, which still has the same function today), to receive their guest fellows coming from other Syrian cities and countryside, from the Levant, and even from Egypt, to host them in the Sufi *zawiyas*.

One of the most important Sufi orders’ processions, *al-Jandaliya al-Rifaiya*, set off from its *zawiya* in *Bab Al-Dreib* neighborhood, followed by other orders present in *Bab al-Souk* square, heading to *Khaled ibn al-Walid* Mosque (the most prominent religious symbol in the city until now) to receive the main banner for the *Sanjak* celebration, whose procession will lead on Thursday (Figs. 1, 2, 3, 4, 5, 6 and 7). This part of the celebration was a tradition that symbolized the exit of the *Sanjak* of *al-Aqsa* Mosque in Jerusalem, which led the orders’ processions in the celebration of the Thursday of Jerusalem in Palestine.

When the *Sanjak* of *Khalid ibn al-Walid* Mosque was received, its procession was followed by notables and scholars, and *al-Jandaliya al-Rifaiya* procession and representatives of the rest of the orders behind it, to reach *Zawiya al-Jandaliya al-Rifaiya*.

The people of the city considered that the celebration had already started from Wednesday evening as if it was the festival eve. At dawn on Thursday, people used to go out, individuals and groups, including children, to *Bab al-Turkman* (west-southern gate of the city, near the Citadel), where the processions gathered waiting for the announcement of the celebration’s start. As for city’s residents, they usually gathered in front of the *zawiyas* of each Sufi order, to go out together following their leader procession, who represented the whole neighborhood, its notables, and its main figures (Al-Sibaai and Al-Zahravi 1992; Gillon, 1993/1997; Hussein Agha 2019; Safi 1983).

Thursday, the Big Day

On the main celebration day of *Khamis al-Mashaykh*, the procession of each leader of the Sufi orders, consisted of several groups “*Noba*,” followed by the order leader on his horse, surrounded by his followers, fans, and young men of his neighborhood. The *Noba* consisted of several traditional musical instruments and was accompanied by a *Sanjak*. Each order was distinguished by the colors of its flags and *Sanjak* highlighted the military character of the procession.

The procession of each leader marched from his *zawiya* since Thursday morning to *Bab al-Turkman*, where the crowds eagerly awaited the arrival of the orders’ leaders (Figs. 8, 9, 10, 11 and 12). They continued their march westward to a square outside the city wall (currently *Hajj Atef* square), to the western axis of the city “Tripoli Road,” and from there to the village of *Baba Amro*, to visit the important shrine there. Everyone enjoyed a break under the trees of the village’s orchards, ate their food, and performed many of their religious chants, surrounded by crowds of people, which attracted a lot of street vendors who served this large gathering.

After the *Zuhr* (afternoon) prayer, the processions were organized for the big launch, so they returned through the western axis of the city to pass the cemetery located at *Bab Hud* (western gate of the city). Then they headed to *al-Saraya* Street (currently *al-Quwatli* Street; links the most important squares of the city, the New Clock Square and *Bab al-Souk* Square). This street received the largest number of people, so that the roofs and balconies of the buildings were rented in advance, especially by women and children (Figs. 13 and 14). After that, the processions continued their march to *Bab al-Souk* Square, heading to the northern axis of the city “Hama Road” to visit the mosque of *Khalid ibn al-Walid*. The *Asr* (late afternoon) prayer used to be performed in this mosque, and after a short break, the processions prepared again to return to the city. They exited from the mosque towards the main northern road, to reach *Bab Tadmor* (Fig. 15), next to *al-Katib* cemetery, which contained the tombs of many Muslim martyrs (until nowadays). This cemetery was and still located on a high hill, which made it an attractive place for women to wait for processions to pass. Consequently, large crowds of people gathered at this gate.

Part of the processions entered the city from *Bab Tadmor*, while the other part followed along the eastern wall to reach *Bab Al-Dreib*. Thus, the entry of the processions into the city became completed, and each Sufi leader went to his *zawiya* with his followers and visitors to eat after the *Maghrib* (sunset) prayer. Hence, suitable accommodations for guests were provided (Al-Sibaai and Al-Zahravi 1992; Gillon 1993/1997; Hussein Agha 2019; Safi 1983).

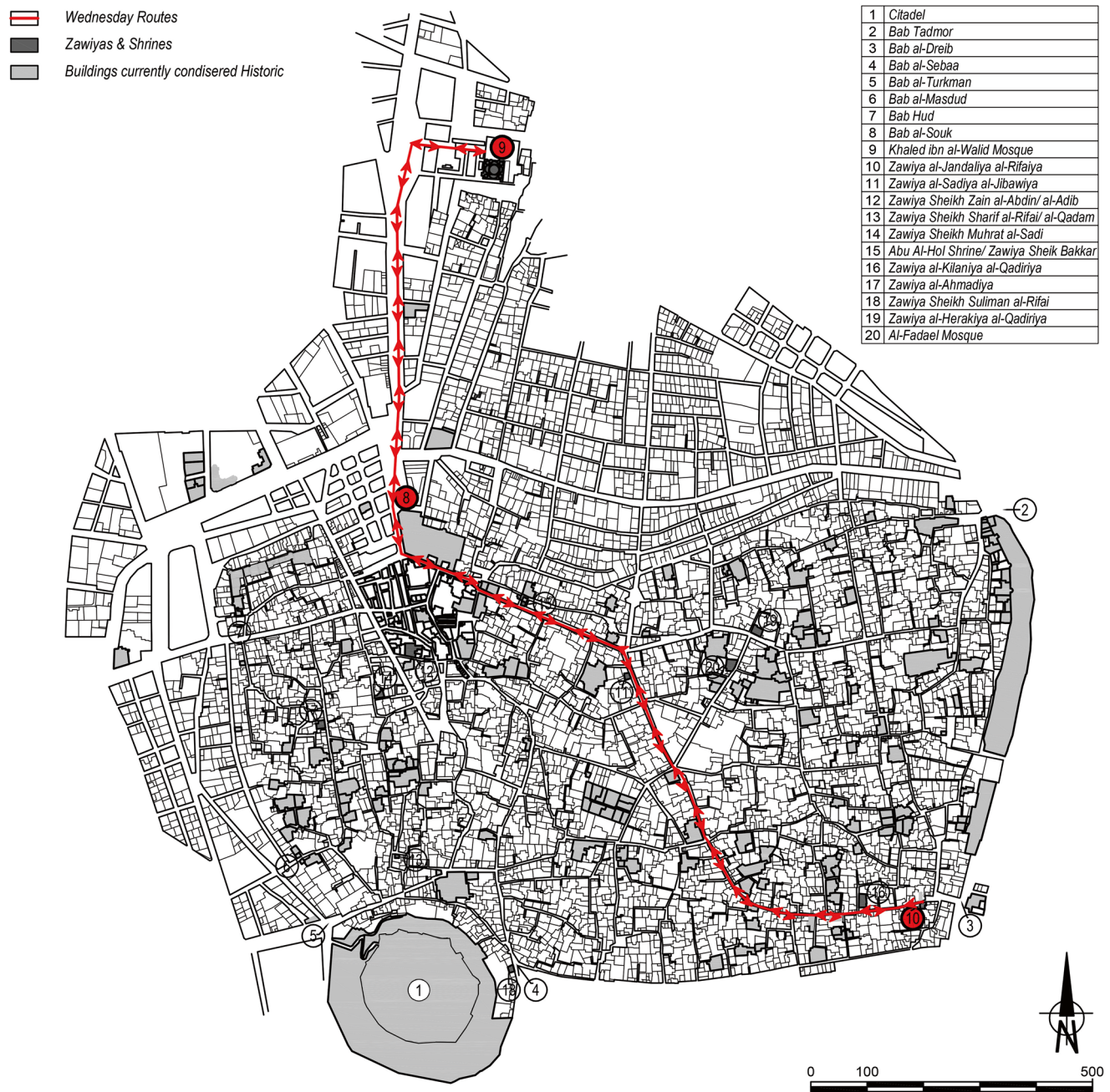


Fig. 1 Wednesday Routes of *Khamis al-Mashaykh* in Homs. (*Homs Old City Map 1923*, elaborated by authors)

Friday

On the next Friday morning, one of the Sufi orders, *al-Qadiriya*, usually left its *Zawiya* “*Abu al-Hol* shrine” (Figs. 16 and 17), near the Roofed Market, aiming to receive the main *Sanjak*. Then the processions, which were approved on Friday, started their march under the leadership of the head of *al-Qadiriya* order. Friday processions made their way passing through the Roofed Market (northwest of the city, Fig. 18), to the main commercial square “*Bab al-Souk*,”

then to the northern axis “*Hama Road*” towards *Khaled ibn al-Walid* Mosque.

After the Friday *Zuhr* prayer, the processions returned through “*Hama Road*” to *al-Saraya* Street, to reach the field square “*al-Maydan*” west of the wall, where *Asr* prayer was performed. Then the processions turned to *Bab al-Turkman* to enter the city heading to their *zawiyas* (Al-Sibai and Al-Zahravi 1992; Gillon, 1993/1997; Hussein Agha 2019; Safi 1983).

Fig. 2 *Al-Jandaliya al-Rifaiya* procession setting off from its *zawiya* (location 10) in the forties of the twentieth century. (Hussein Agha 2019, p. 192)



Fig. 3 *Zawiya al-Jandaliya al-Rifaiya* today; only its sanctuary remained due to the street widening in 1972

The procession of *al-Kilaniya al-Qadiriya* order had its own way back from *Khaled ibn al-Walid* Mosque, where they left through the southern door of the mosque, entered the city through *Bab al-Souk*, then exited through *Bab Hud*, headed south around the Citadel and the southern wall to enter the city from *Bab al-Darib* to its *zawiya* (Hussein Agha).

Saturday

On Saturday, the annual celebration of *Khamis al-Mashaykh* ended in “*al-Fadael* mosque,” in “*Bustan Al-Diwan*” neighborhood located in the north of the city, where people gathered in the mosque after the *Asr* prayer. The leader of *al-Herakiya al-Qadiriya* order headed from his *zawiya* to the

nearby “*al-Fadael* mosque” (Figs. 16 and 19). Followers, leaders, notables, and neighborhood residents and visitors, all gathered around him marching to the mosque without flags or horses, repeating their prayers till the *Isha* (night) prayer (Al-Zahrawi 2001; Gillon, 1993/1997; Hussein Agha 2019; Safi 1983).

7.4 *Khamis al-Mashaykh* as Homs Annual Economic Season

Although this event organized once a year, the preparations for it were taking place several weeks in advance, included an active religious, social, and economic movement as well. The



Fig. 13 Al-Nouri historical building in Tripoli, Lebanon: Condition before development (Author, 2023)

are crucial for addressing the preservation and restoration of historic buildings.

6.5 Preservation Challenges: Material Degradation and Restoration Techniques

In the study of the structural integrity and deterioration of building materials, an indispensable aspect of restoring historic buildings is the thorough examination of building materials to identify and assess their condition in order to prevent further deterioration and ascertain their preservation status. The building's interior condition worsens over time, raising concerns about long-lasting and irreversible damage as well as structural safety. In order to address these concerns, regular on-site inspections and evaluations were conducted to accurately diagnose any disorders and other defects. The evaluations encompass visual inspections, photographs, and measurements, which are integral components of site investigations. The findings are as follows: cracking and fracturing, breakdown, material degradation: alveolization, absence of a portion, perforation, pitting, the presence of a black crust, staining, and a moist area biological colonization encompasses the establishment of colonies by wasps and ants, as well as the growth of algae, lichen, moss, and plants. The following section will discuss preliminary recommendations for treatments.

Cracks: The existence of structural damage and fractures in building components is a matter of great concern.

Addressing fissures in historical edifices is a crucial element in safeguarding architectural legacy and fortifying the framework (Bukała et al. 2018). Because it reduces the stability and durability of the structure. Acoustic emission monitoring can detect small cracks (Verstryngge et al. 2021). Following the removal of any large loose debris, the cracks should be thoroughly cleaned using a delicate brush. The repair mortar applied should possess a similar strength to that of the original material (Maras 2021). Also, epoxy injection could be an effective way (Abdulqadir and Karim 2022).

Staining, Black Crust, and Discoloration: Heavy cleaning could damage the outer skin of the building. For that, general cleaning is important (Corvo et al. 2009). Some low-cost cleaning methods, such as gum, rubber air jets, or paper pulps, may remove discoloration with minimum impact (Macholdt et al. 2017), while a more expensive method like laser washing shows better results (Bonazza et al. 2007). Many studies show a correlation between black crusts and pollution around the site (Campos et al. 2021). Reducing pollution sources in the vicinity will mitigate the deterioration of building exteriors.

Perforation: Studying the architectural identity of a building is important when deciding on materials to fill perforation voids. Mixing polymer grids and fiber mortars significantly enhances the seismic resistance of stone masonry structures. And, it is also important to select ductile lime mortar in stone masonry to reduce stress concentrations, despite its low tensile resistance (Juhasova et al. 2008).

Moss and Algae: These organisms, when present on stone surfaces, can gradually wreak physical damage to the

building materials. Biocide can be employed for removal; however, it is vital to take note that various materials need distinct treatment methods (Ríos et al. 2012).

6.6 Developing Proposal

The architects carefully thought about what they could learn from these case studies in order to make a design for the building that made the most of its potential. We were able to see how adaptive reuse changed the use of the building in the case study after the studies were looked at. How glass was used to fill in missing walls and make case study two more clear. How 3D modeling and new technology were used to reuse case study three. How important it was to have sidewalks and public spaces for people to use, what the building needed based on, and what could be seen. All of these things were thought about when the building was planned. Adaptive reuse techniques made sure that the building could be used for different things and changed to fit different needs over time. Glass walls let natural light flood the inside and made it feel more open (as shown in Fig. 14).

The central role of social interaction in Lebanese society is crucial due to prevalent political, economic, and social dis-

crimination. To put an end to this discrimination, we can establish platforms where individuals can freely express their viewpoints and ideas, thereby eliminating the barriers that separate them from various groups.

The cultural center comprises three conference rooms, a multipurpose room, a designated area for coffee breaks, an electronic and traditional library, as well as a restaurant. The distribution of the rooms is as follows: basement, entrance, restaurant, director's office, office, and two conference rooms. Located on the first floor are a versatile room, an adjacent coffee break area, a conference room, and a library featuring a terrace. The restaurant features an expansive kitchen dedicated to serving patrons. This kitchen is equipped with a separate exit to ensure minimal disruption to customers. Additionally, it accommodates the coffee break zone, located on the first floor. The conference rooms on the ground floor are strategically arranged to provide an additional secure means of egress to the exterior in the event of a fire. A staircase leads us to the first floor above the conference rooms, where we find a spacious lobby and waiting area. The conference room can be accessed from beneath the stairs. Regarding the upper part, we possess the previously mentioned library that includes a terrace (as shown in Fig. 15).



Fig. 14 Al-Nouri historical building in Tripoli, Lebanon: after developing while preserving architectural identity (Author, 2023)

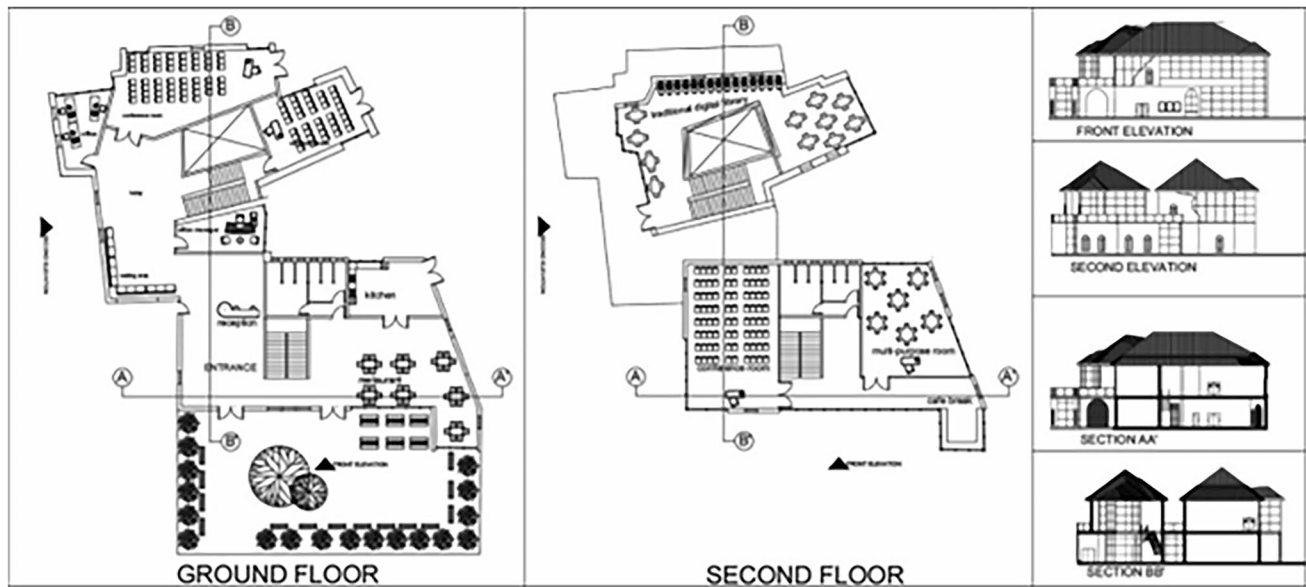


Fig. 15 Plans, section, and elevation of Al-Nouri historical building in Tripoli, Lebanon: after developing while preserving architectural identity (Author, 2023)

7 Conclusion

Incorporating the Nouri Historical Building into our study and reusing it adaptively as a cultural center exemplifies the practical application of conservation principles approach, where the Nouri Building is situated among the culturally rich landscape of Tripoli, Lebanon, and is a quintessential of the challenges and opportunities in heritage building preservation. Also, its historical significance and architectural distinctiveness make it an ideal candidate for demonstrating the effective implementation of adaptive reuse and modern integration while preserving its intrinsic historical essence. Therefore, this approach ensures that the aesthetic and historical values of the heritage buildings are preserved while accommodating modern requirements.

Therefore, the conservation and development of heritage buildings in contemporary times present distinct challenges, particularly in the context of preserving their architectural integrity. This approach delineates strategies aimed at preserving the historical and architectural integrity of heritage buildings while accommodating contemporary requirements, which can be achieved as follows:

- The preservation process should involve the assessment of potential aesthetic impact against the loss of heritage values and the embodied energy in the original materials, highlighting the need for a balanced approach that considers both aesthetic and historical significance.
- The sustainable preservation and adaptive reuse of heritage buildings require a multifaceted approach that integrates various stakeholders and advanced technologies while adhering to conservation standards and guidelines.

- The involvement of diverse stakeholders, including local communities, historians, and conservationists, is crucial to ensure a comprehensive perspective that values the historical and cultural significance of the buildings.
- The adoption of advanced technologies such as 3D scanning and smart monitoring systems plays a pivotal role in documenting, restoring, and preserving these buildings, bridging the gap between past craftsmanship and future preservation.
- The choice of materials and restoration techniques is critical, necessitating a careful selection that aligns with the original fabric in texture, color, and finish while employing traditional methods wherever possible to maintain authenticity.
- The importance of community awareness and engagement in the conservation of heritage buildings, as adequate policies and strategies are necessary to manage cultural heritage at risk.

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References

- Abdulqadir, Z., & Karim, F. R. (2022). Evaluating the Efficiency of Epoxy Injection Technique for Repairing Normal and High Strength Concrete Beams - A Critical Review. *Construction*. <https://doi.org/10.15282/construction.v2i2.8522>
- Al-Obaidi, K. M., Wei, S., Ismail, M. A., & Kam, K. J. (2017). Sustainable Building Assessment of Colonial Shophouses

- After Adaptive Reuse in Kuala Lumpur. *Buildings*. <https://doi.org/10.3390/buildings7040087>
- Al-Sakkaf, A., Zayed, T., Bagchi, A., Mahmoud, S., & Pickup, D. (2020). Development of a Sustainability Rating Tool for Heritage Buildings: Future Implications. *Smart and Sustainable Built Environment*. <https://doi.org/10.1108/sasbe-04-2020-0047>
- Ali, W. N. W., & Ahmad, A. G. (2022). A Systematic Evaluation Tool for Heritage Shophouse Facades. *Planning Malaysia*. <https://doi.org/10.21837/pm.v20i21.1087>
- Ali, Z., Zawawi, R., Myeda, N. E., & Mohamad, N. (2019). Adaptive Reuse of Historical Buildings. *International Journal of Building Pathology and Adaptation*. <https://doi.org/10.1108/ijbpa-04-2018-0029>
- Annibaldi, V., Cucchiella, F., De Berardinis, P., Gastaldi, M., & Rotilio, M. (2020). An integrated sustainable and profitable approach of energy efficiency in heritage buildings. *Journal of Cleaner Production*, 251, 119516.
- Aronsson, P., & Elgenius, G. (2014). National Museums and Nation-Building in Europe 1750–2010. <https://doi.org/10.4324/9781315737133>
- Awad, M. (2014). Montazah the royal palaces and gardens. In Alexandria, Egypt: Bibliotheca Alexandrina.
- Bahtiyar, T. B., & Yaldız, E. (2021). Disidentification in Modern Architecture Products: Edirne Government Mansion. *Global Journal of Arts Education*. <https://doi.org/10.18844/gjae.v11i1.5728>
- Balocco, C., & Marmonti, E. (2013). Optimal and sustainable plant refurbishment in historical buildings: A study of an ancient monastery converted into a showroom in florence. *Sustainability*, 5(4), 1700–1724.
- Bonazza, A., Brimblecombe, P., Grossi, C. M., & Sabbioni, C. (2007). Carbon in Black Crusts From the Tower of London. *Environmental Science & Technology*. <https://doi.org/10.1021/es062417w>
- Buda, A., Ernst Jan de Place, H., Rieser, A., Giancola, E., Pracchi, V., Mauri, S. D., . . . Herrera-Avellanosa, D. (2021). Conservation-Compatible Retrofit Solutions in Historic Buildings: An Integrated Approach. *Sustainability*. <https://doi.org/10.3390/su13052927>
- Bukała, M., Chyła, A., Kruszka, L., & Muzolf, P. (2018). Technical Diagnostics of the Historic Apartment House Located at No. 31 in Dobra Street in Warsaw. *Matec Web of Conferences*. <https://doi.org/10.1051/mateconf/201817403011>
- Busch, W. (1986). Wilhelm von Kaulbach-peintre philosophe und modern painter. Zu Kaulbachs Weltgeschichtszyklus im Berliner Neuen Museum.
- Buttlar, A. v. (2010). *Neues Museum Berlin: Architekturführer*. Deutscher Kunstverlag (DKV).
- Campos, B., Marco, A., Freire-Lista, D. M., Durães, N., Silvestre-Albero, J., Silva, E. F. d., . . . Moreira, P. (2021). Rare Biogeochemical Phenomenon Associated to Manganese Patinas on Mural Painting and Granite Ashlars. *Coatings*. <https://doi.org/10.3390/coatings11080917>
- Conejos, S., Langston, C., Chan, E. H. W., & Chew, M. Y. L. (2019). Governance of heritage buildings: Australian regulatory barriers to adaptive reuse. In *Building Governance and Climate Change* (pp. 160–171). Routledge.
- Corvo, F., Reyes, J., Valdés, C., Villaseñor, F. C., Cuesta, O., Aguilar, D. H., & Quintana, P. (2009). Influence of Air Pollution and Humidity on Limestone Materials Degradation in Historical Buildings Located in Cities Under Tropical Coastal Climates. *Water Air & Soil Pollution*. <https://doi.org/10.1007/s11270-009-0081-1>
- Coulleri, A. (2022). *El Roser Social Center / Josep Ferrando Architecture + Gallego Arquitectura*. ArchDaily. <https://www.archdaily.com/984088/el-roser-social-center-josep-ferrando-plus-gallego-arquitectura>
- Eisele, G. R., & Seiler, J. (2012). Reconstruction of the Neues Museum in Berlin, Germany. *Proceedings of the Institution of Civil Engineers - Engineering History and Heritage*. <https://doi.org/10.1680/ehah.11.00013>
- El-Daghar, K. (2019). Self-financing for Conservation Based on Global Experiences—Case Study Preserving the Architectural Heritage of Historical Tripoli, Lebanon. *Resourceedings*, 2(2), 224–236.
- Elsayed, S. (2019). Egyptian Historic Hotels and Heritage as a Customers' Attraction.
- Fadli, F., & AlSaeed, M. (2019). A Holistic Overview of Qatar's (Built) Cultural Heritage; Towards an Integrated Sustainable Conservation Strategy. *Sustainability*. <https://doi.org/10.3390/su11082277>
- Farhad, S., Tilaki, M. J. M., & Marzbali, M. H. (2022). Returning to Historic Neighborhoods: Exploring the Role of Architectural Identity Elements on the Formation of Physical Identity. *Housing Care and Support*. <https://doi.org/10.1108/hcs-09-2021-0024>
- Günçe, K., & Misirlısoy, D. (2019). Assessment of Adaptive Reuse Practices Through User Experiences: Traditional Houses in the Walled City of Nicosia. *Sustainability*. <https://doi.org/10.3390/su11020540>
- Hamid, M., Hanks, L. H., & Qi, W. (2021). Is It Possible to Define Architectural Identity More Objectively? https://doi.org/10.1007/978-3-030-51961-2_8
- Hao, L., Herrera-Avellanosa, D., Pero, C. D., & Troi, A. (2020). What Are the Implications of Climate Change for Retrofitted Historic Buildings? A Literature Review. *Sustainability*. <https://doi.org/10.3390/su12187557>
- Hassan Allam Holding. (2023). *Restoration of El-Salamlek*. <https://www.hassanallam.com/projects/restoration-of-tel-salamlek>
- Juhasova, E., Sofronie, R., & Bairrao, R. (2008). Stone Masonry in Historical Buildings — Ways to Increase Their Resistance and Durability. *Engineering Structures*. <https://doi.org/10.1016/j.engstruct.2007.07.008>
- Kim, D. H., & Felkner, J. (2018). A Sustainable Approach to the Adaptive Reuse of Historic Brick Buildings: Analysis of Energy Efficiency Strategies for Historic Facade Retrofits. <https://doi.org/10.14305/ibpc.2018.be-7.01>
- Kyaw, K., Fufa, S. M., & Kraniotis, D. (2023). Adaptive Reuse of Industrial Heritage Building—Comparative Life Cycle Assessment Using a Case Study in Norway. *Iop Conference Series Earth and Environmental Science*. <https://doi.org/10.1088/1755-1315/1196/1/012107>
- Łaskiewicz, E., Nowakowska, A., & Adamus, J. (2022). How Valuable Is Architectural Heritage? Evaluating a Monument's Perceived Value With the Use of Spatial Order Concept. *Sage Open*. <https://doi.org/10.1177/21582440221142720>
- Lou, E. C. W., Chan, P. W., & Hamzah, N. (2020). Heritage adaptation beyond the technical: conflicts and compromise between social, environmental and economic sustainability. *International Journal of Building Pathology and Adaptation*, 38(2), 257–261. <https://doi.org/10.1108/ijbpa-04-2020-112>
- Lu, S., Zhang, Y., Zhou, Z., Wei, L., & Luo, Z. (2022). BIM Information Classification and Codification for Manufacturing Heritage Buildings. *Journal of Physics Conference Series*. <https://doi.org/10.1088/1742-6596/2261/1/012020>
- Machado, S. (2020). *Machado Silvetti designs glass enclosure for Virginia home of signer of Declaration of Independence*. <https://www.dezeen.com/2020/06/15/the-glass-house-project-machado-silvetti-virginia/>
- Macholdt, D. S., Herrmann, S., Jochum, K. P., Kilcoyne, A. L. D., Laubscher, T., Pfisterer, J. H. K., . . . Andrae, M. O. (2017). Black Manganese-Rich Crusts on a Gothic Cathedral. *Atmospheric Environment*. <https://doi.org/10.1016/j.atmosenv.2017.10.022>
- Maras, M. M. (2021). Characterization of Performable Geopolymer Mortars for Use as Repair Material. *Structural Concrete*. <https://doi.org/10.1002/suco.202100355>
- Marra, A., Sabino, A., Bartolomucci, C., Trizio, I., Mannella, A., & Fabbrocino, G. (2021). On a rational and interdisciplinary framework for the safety and conservation of historical centres in Abruzzo Region. *International Journal of Architectural Heritage*, 15(4), 608–626.