IntechOpen

Conservation of Urban and Architectural Heritage

Past, Present and Future

Edited by Kabila Hmood

Conservation of Urban and Architectural Heritage - Past, Present and Future

Edited by Kabila Hmood

Published in London, United Kingdom

Conservation of Urban and Architectural Heritage - Past, Present and Future
http://dx.doi.org/10.5772/intechopen.104195
Edited by Kabila Hmood

Contributors
Nurfer Tercan, Dejan Ratomir Dasić, Ilda Koca Baltic, Pan Husheng, Ping Li, Lie Zhang, Maya Charif Hassan, Shatha Sakher, Kabila Faris Hmood, Asma Khalid, Nur Dalilah Dahlan, Ombeni Swai, Marwa Elkady, Mohammad Mahmudul Hasan Khan, Mohammad Niamul Huda, Mohammadreza Hajialikhani

First published in London, United Kingdom, 2023 by IntechOpen
IntechOpen is the global imprint of INTECHOPEN LIMITED, registered in England and Wales, registration number: 11086078, 5 Princes Gate Court, London, SW7 2QJ, United Kingdom

British Library Cataloguing-in-Publication Data
A catalogue record for this book is available from the British Library

Additional hard and PDF copies can be obtained from orders@intechopen.com

Conservation of Urban and Architectural Heritage - Past, Present and Future
Edited by Kabila Hmood
p. cm.
Print ISBN 978-1-83768-613-1
Online ISBN 978-1-83768-614-8
eBook (PDF) ISBN 978-1-83768-615-5

Meet the editor

Prof. Dr. Kabila Faris Hmood obtained a Ph.D. in 1996. She has been a professor since 2004 and has worked at the University of Baghdad, Iraq, and Al-Zaytoonah University of Jordan. Dr. Hmood has published many books and more than thirty-five research papers. She has supervised several master's and doctoral theses. She is also a reviewer for numerous journals. She is the recipient of the 2022 Outstanding Reviewer Award from *Civil Engineering and Architecture*. She is also among the top reviewers for the *Journal of Asian Architecture and Building Engineering.* Dr. Hmood is a member of the international scientific advisory committees of many international conferences and a member of the Organization for Women in Science for the Developing World (OWSD).

Contents

Preface

Cultural heritage is an expression of the ways of living developed by society and passed down from generation to generation, including customs, practices, places, objects, artistic expressions, and values. Cultural heritage is often expressed as intangible or tangible cultural heritage. History and historical processes have contributed to the development of the concept of cultural heritage, which is constantly evolving. Urban and architectural heritage represents an important part of tangible cultural heritage. Elements of cultural heritage are symbolic and they represent identities in terms of culture and natural surroundings. Connecting and maintaining these elements creates a sense of community. At the same time, the selection of heritage elements, monuments, or preserved natural environments determines the future view of the elements of heritage and history and the societal consensus about both the past and the present as a step toward the future. We all know the importance of the architectural and urban heritage of all world countries, as it is the tangible memory of the people's history and civilization. In the last decades of the twentieth century, and even since the Second World War, interest has increased in finding appropriate methods to preserve this cultural heritage, including architectural and urban heritage. The interest in preserving heritage does not conflict with the importance of giving the present its mark and its distinguished presence based on the achievements of the past. Nor does it contradict what we aim for in our future cities. The past, present, and future present the beginning and origin connected with reality and future goals. Heritage is of increasing significance to each society. Why this is so is not entirely clear, but it probably has to do with the increasing speed of modernization and the scale of change in society. In such circumstances, evidence of past societies (heritage and ruins) can provide a sense of belonging and security to modern societies and be an anchor in a rapidly changing world. In many societies too, heritage can be an important definer of identity. Also, understanding the past could be of great help in managing the problems of the present and the future. The range of what is regarded as heritage has broadened significantly over the last half-century. Heritage properties tended to be individual monuments and buildings, such as places of worship or fortifications and were often regarded as standalone, with no particular relationship to their surrounding landscape. Today, there is general recognition that the whole environment has been affected by its interaction with humanity and is therefore capable of being recognized as heritage. It becomes even more necessary to make judgments about what has significance and what does not. The World Heritage Convention recognizes that heritage can be defined as "monuments, groups of buildings and sites." In practice, a broad set of typologies has developed that includes urban centers, archaeological sites, industrial heritage, cultural landscapes, and inherited routes. This greatly increases the range of places and landscapes that must be managed by heritage managers. Filden defines cultural heritage, of which architectural heritage is an important part, as "the physical image and physical embodiment of unique human components in which man is the basis of creation, creativity, and production." The expanding concept of heritage and the increased importance given to how heritage places relate to their surroundings mark an important shift in thinking.

Heritage places cannot be protected in isolation or as museum pieces, isolated from natural and humanmade disasters or from land-use planning considerations. Nor can they be separated from development activities, isolated from social changes that are occurring, or separated from the concerns of the communities. Why do we preserve our cultural heritage, including architectural and urban heritage?

- Heritage has and continues to play an important role in the national construction of society.
- Heritage is a way to revitalize societies intellectually, culturally, and artistically.
- Heritage is a means of education for the local or external community.
- Heritage stimulates society to take care of the environment in the present and future.
- Heritage is a means of recognizing people, their customs, their traditions, their history, and their civilization.
- Heritage is a wide area of study and research in historical documents.

Urban and architectural heritage in cities worldwide is very important, both in the present and the future. This importance leads to sustainable development, which satisfies the needs of the present and protects future rights. Preserving architectural and urban heritage is very important in illustrating the concept of "dual cities," in which the old parts preserve their architectural style while the modern part of the city is being developed in the same heritage style. Successful experiments in conserving urban and architectural heritage worldwide are also important. This book attempts to answer several questions: What is cultural heritage, including urban and architectural heritage? Why do we lose our heritage, and what about our Identity? How do we deal with current urban renewal policies? What are our policies for conservation, rehabilitation, restoration, and preservation? What is the role of digital methods in the conservation of urban and architectural heritage in our contemporary time?

This book is organized into three sections and eleven chapters.

Section 1, "Urban Heritage within Urban Renewal Policies", includes four chapters. Chapter 1, "The Role of Civil Society Organizations in Protecting the Urban Heritage in As-Salt City–Jordan", discusses the role of civil society organizations in protecting urban heritage. The authors, Dr. Shatha Sakher and Prof. Kabila Hmood conducted interviews with the heads of cultural and tourism associations and the associations concerned with reconstructing the urban heritage in As-Salt city. Based on their findings, the authors recommend establishing coordination between civil society organizations and official institutions on issues of preserving urban heritage, under a single and comprehensive umbrella with a vision to ensure the unification of efforts through dialogue, coordination, and cooperation. They also recommend exchanging ideas and opinions on programs for the maintenance, restoration, and preservation of historical buildings. In Chapter 2, "Constructing New City Downtowns: A Solution for Preserving the Historical Urban Heritage", Dr. Hajialikhani Mohammadreza highlights cities with historical urban areas that always have urban heritage. The chapter

highlights the solution to the problem of increasing the size and population of cities that may be constructing new downtowns. The solution presented has been used in Isfahan (Iran) since the seventeenth century. It was also implemented in London, Melbourne, Belfast, and Buenos Aires in the twentieth century. Chapter 3, "The Public Urban Spaces Renewal and Architectural Heritage Revitalization: A Lasting Interconnection" by Ilda Koca Baltic, examines the future of urban renewal, which involves understanding both urban spaces and architectural context. In addition, the author highlights the importance of the interconnection between historical buildings and urban areas for improving energy, economics, and social sustainability. This chapter considers innovative ways of understanding the connection between public space renewal and architectural heritage revitalization to represent the creation of modern urban centers and community meeting places. Chapter 4, "The Role of Museums and Communities in Sustainable Heritage Site Management in Bangladesh: The Case Study of Mahasthangarh", by Mohammad Mahmudul Hasan Khan and Mohammad Niamul Huda, discusses managing cultural heritage and the threats and challenges that sites face. Unfortunately, there is no effective management plan in Bangladesh. The chapter demonstrates the roles and potentialities of site museums and local communities in forming sustainable heritage management by using qualitative, and quantitative methods and SPSS software.

Section 2, "Conservation of Urban and Architectural Heritage", includes three chapters. Chapter 5, "A Conceptual Framework for Conserving Architectural Heritage in Graeco-Roman Egypt: A Goals-and-Applications Approach" by Prof. Marwa Elkady, discusses conservation programming, which is used to achieve different political, economic, social, and cultural objectives. Among all the conservation programs, religious programs make up the lion's share, most notably for the reconstruction of damaged Pharaonic temples, including those in Edfu, Dendera, Esna, and Philae. This chapter examines the concept and method of conserving architectural heritage and revitalizing traditions at that time. It also discusses the goals underlying this strategy, how they were developed, and how they affect society. Moreover, the chapter outlines a theory for reviving the past in the present through architectural heritage conservation like that of Graeco-Roman Egypt. Chapter 6, "Digital Immersion Technology and Its Strategy in the Field of Urban and Architectural Heritage Conservation" by Pan Husheng, Ping Li and Lie Zhang, discusses the application of digital immersion technology in urban and architectural heritage conservation, examining its development status and trends. The chapter analyzes relevant projects and summarizes ideas and strategies, hoping to provide a possible technical approach and reference of ideas and strategies for the digital conservation of urban and architectural heritage worldwide. In Chapter 7, "Adaptive Reuse of Historic Buildings towards a Resilient Heritage", Assistant Prof. Maya Hassan reviews the development of the global principles of historic building reuse and the theories of fundamental intervention, starting from the Italian Renaissance and the French Revolution at the end of the eighteenth century, moving on to adaptive reuse, which was manifested in the dominant architectural language during the 1960s and 1970s, and ending with the integration of heritage preservation into comprehensive sustainable development agendas at the beginning of this century.

Section 3, "Loss of Identity, cultural and Architectural Heritage", includes four chapters. Chapter 8, "Unwanted Cultural Heritage of the Republics of the Former Yugoslavia", by D.Sc. Dejan Dašić, examines the history, systematic destruction, and current state

of monuments to the national liberation struggle in the former Yugoslavia. The chapter studies cultural heritage after the breakup of the former Yugoslavia in 1990 when all republics, without exception, began to destroy the cultural heritage created between 1945 and 1990. Chapter 9, "Wind Catcher: A Lost Architectural Heritage with Timeless Passive Attributes" by Asma Khalid and Nur Dalilah Dahlan, discusses the wind catcher in metropolitan cities of Pakistan. Because it is viewed as a lost heritage of the past, campaigns to revive the wind catcher as a cooling and air displacement device are surfacing among the global communities. By using digital ethnography, the responses toward wind catchers in commercial and residential buildings are observed via online social media, blogging, and video documentaries. Chapter 10, "Fractal Dimension and Perception of Order in Islamic Art" by Dr. Nurfer Tercan, discusses how the mathematical harmony of the universe has been and continues to be one of the main components in Islamic art. This topic represents one of the most important characteristics of Islamic art. Finally, Chapter 11, "Diminishing Architectural Artifacts along the Coastal Stretch of Tanzania", by Ombeni Swai, investigates and documents the existing architectural heritage in Bagamoyo and Dar es Salaam in the midst of urbanization, during which artifacts have been dwindling over time. The author concludes that both Bagamoyo and Dar es Salaam have valuable architectural and cultural heritage elements such as Arabic, Swahili, Indian, Islamic and Western, both modern and contemporary, that must be restored, upkept, and maintained for the two cities' sustainability. According to the study, most architectural artifacts from the two localities are left to deteriorate over time due to a lack of resources, proper management, a lack of integrated policies between urban development and urban conservation, and a lack of awareness of the importance of historical heritage. There is a need to raise awareness among local officials, the government at large, and a few private individuals who own heritage buildings so that they can collaborate to develop strategies to manage the heritage.

I would like to thank all the authors for their valuable contributions to this book. I would also like to thank the Publishing Process Managers at IntechOpen for their patience, understanding, and effective coordination of the complex publishing process. I dedicate this book to my husband Sabri Kamash, who stimulated and mobilized me to work on the edition of this book. I hope that Sabri's knowledge of his specialization, which is city planning, will allow us to publish a book on this topic in the future.

Dr. Kabila Hmood
Professor,
Faculty of Architectural Engineering,
Department of Architecture,
University of Baghdad,
Baghdad, Iraq

Section 1

Urban Heritage within Urban Renewal Policies

Chapter 1

The Role of Civil Society Organizations in Protecting the Urban Heritage in As-Salt City – Jordan

Shatha Sakher and Kabila Hmood

Abstract

This book chapter aimed to identify the role of civil society organizations in protecting the urban heritage in As-Salt city in Jordan. For collecting data, the exploratory approach was employed, conducting interviews with the heads of cultural and tourism associations and the associations concerned with reconstructing the urban heritage in As-Salt city. The number of interviewees was 12 participants selected using the purposive sampling method. The results showed that despite the great desire from civil society organizations operating in As-Salt city the completed work does not reflect the actual role that civil society organizations must play in supporting and protecting the urban heritage when compared to developed countries. This can be attributed to the recent emergence of such organizations in Jordan, the idea of volunteering in the Jordanian society, lack of field experience, and the lack of awareness of the importance of nongovernmental organizations. Based on the findings, it is recommended to establish a coordination between civil society organizations and official institutions on issues of preserving urban heritage under a single and comprehensive umbrella and vision to ensure the unification of efforts through dialog, coordination, and cooperation. It is also recommended to exchange ideas and opinions on programs of maintenance, restoration, and preservation of historical buildings.

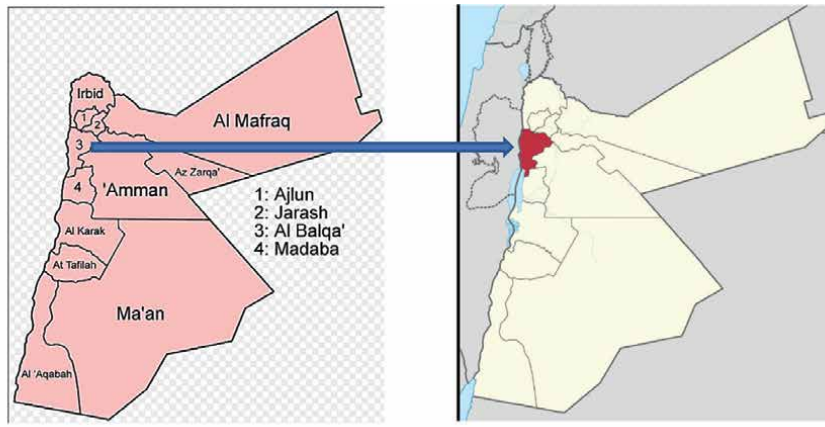
Keywords: civil society organizations, urban heritage, restoration, As-Salt, historical buildings

1. Introduction

Jordan, ancient in its history and originality, possesses many unique cultural and natural heritage sites, which date back to various eras from prehistoric times until the end of the Islamic eras. As-Salt city is one of the prominent heritage sites considered as the first urban site in Jordan to be included on the World Heritage List and the sixth Jordanian site on the list of the United Nations Educational, Scientific, and Cultural Organization (UNESCO).

As-Salt city is located 28 km west of Amman (**Figure 1**), and it is the center of Al-Balqa Governorate (**Figure 2**). It includes many important archeological sites from different eras.

As-Salt is home for the oldest museum in Jordan (the Archeological Museum), As-Salt Historical Museum (Abu Jaber House) (**Figure 3**), the English Hospital, As-Salt Secondary School for Boys, the Tomb of the Unknown Turkish Soldier, and many heritage neighborhoods such as the castle, Al-Khader, the Jada, the old As-Salt neighborhood, the Skafiya market, and the Royal Roman Cemetery in Wadi Shuaib [1]. In the city, the doors of the churches meet with the doors of the mosques. This is noticeable in the Great Mosque of As-Salt, which was built on the ruins of a mosque dating back to the Mamluk era, and it is opposite to the English Council and the Church of the Good Shepherd within the path of "Harmony". Nearby is the 1886 Latin



Jordan Map (source: https://travelistica.com)

As-Salt city in Jordan (source: https://travelistica.com)

As-Salt city

Figure 1.
As-salt city in Jordan. Jordan map. As-salt city in Jordan. As-salt city.

Figure 2.
The city of As-salt is the center of Balqa governorate.

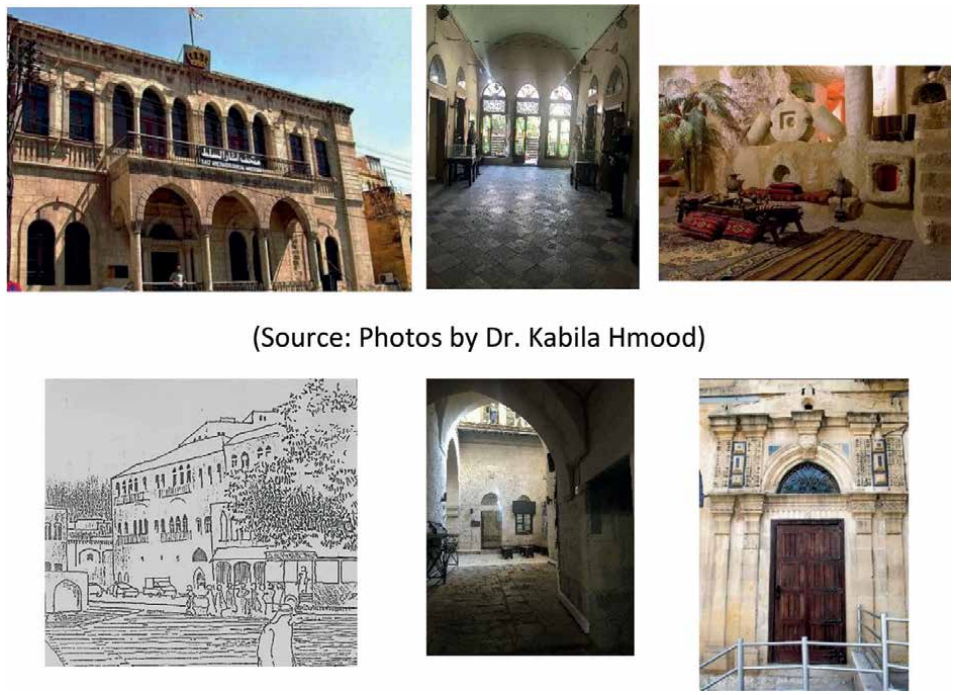


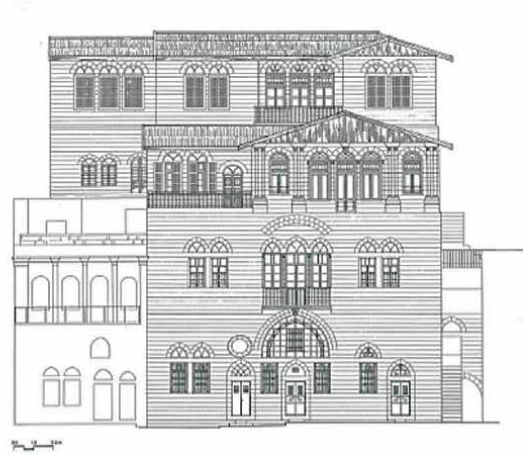
Figure 3.
As-salt historical museum (Abu Jaber house). (source: Photos by Dr. Kabila Hmood).

Church, which is among hundreds of archeological and religious sites. At the heart of the city, there are five Christian and Islamic religious shrines, including the shrine of the Prophet Al-Khidr and the Orthodox Church (**Figures 4–6**), which was built next to an Ottoman cave in 1682 and restored in 2004 [2].

This global recognition of the importance of the city requires preparation and expectation of visits and a large number of tourists. This entails greater responsibility and continuous plans for the development of the city to ensure the preservation of heritage and the continuity of the city's registration on the World Heritage List. Civil society organizations work in cooperation and interaction with governmental

Many important archaeological sites of As-Salt (source: https://travelistica.com)

Balqa Tourism Directorate



As-Sukar House

Figure 4.
As-salt includes many important archeological sites from different eras. Many important archeological sites of As-salt. Balqa tourism directorate. As-Sukar house.

organizations in order to play an important and fundamental role in defining priorities and challenges in development projects, including, in particular, the urban heritage. This is because of the specificity of these organizations represented in their relationship with the target groups, their closeness, and their integration with the different groups in society. This relationship allows civil society organizations to have a clearer and deeper vision of their urgent needs and the problems and obstacles that

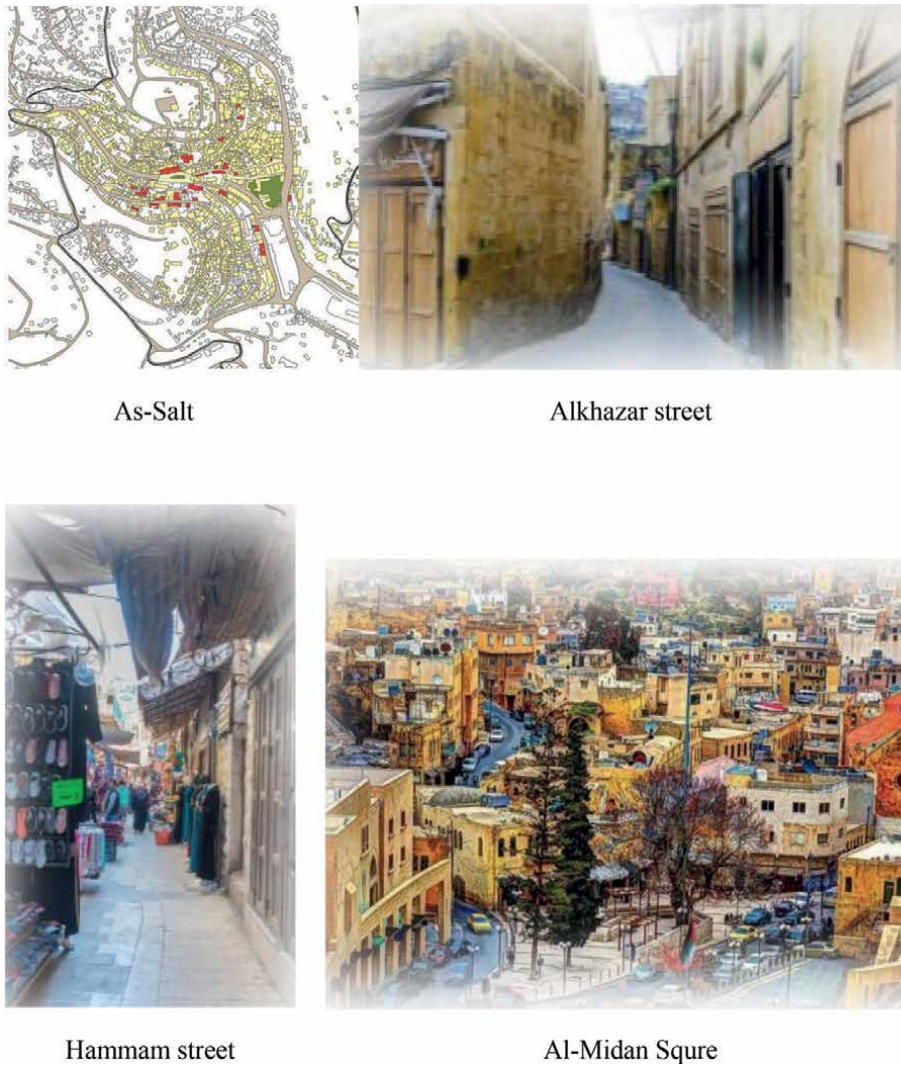


Figure 5.
As-salt includes many important archeological sites from different eras. (public sites). As-salt. Alkhazar street. Hammam street. Al-Midan Square.

may encounter development projects in this regard, and they can convey a clearer and more credible picture to the decision-making authorities [3].

In Jordan, civil society organizations began forming between 1921 and 1948. More than 50 civil organizations were established forming the basic nucleus of economic, social, and political structures such as chambers of commerce, social associations, sports, cultural, and intellectual clubs. From 1948 to1967, the conditions and the socio-political environment developed due to the high rates of education, the spread of schools and institutes, the growth of population, the construction of new cities, the revival of cities on new economic, political, and cultural bases. In addition, the work of official governmental organizations expanded, achieving stability and general development for the various sectors of the Jordanian people. During the period between 1958 and 1965, there were about 116 clubs in Jordan, in addition to numerous

Prophet Shoaib Shrine (Source: Photos by Dr. Kabila Hmood)

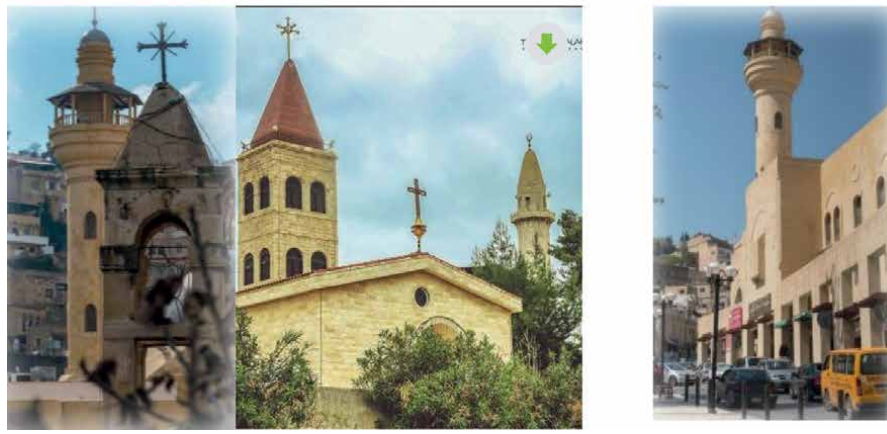


Figure 6.
As-salt includes many important archeological sites from different eras. (mosques and churches). Prophet Shoaib shrine (source: Photos by Dr. Kabila Hmood).

professional and trade union associations. Professional unions began to emerge in the year 1950, and the syndicates of lawyers, doctors, dentists, and engineers were formed. At this stage, the first legal legislation recognizing the right of workers to form a union framework for them was approved. The workers union was established in 1954, and there were more than 39 unions at the end of 1957. The number of associations increased in 1961 to 226 social associations [4], and it went up until it reached 2300 organizations. The number of members also exceeds one million, and its spread in many Jordanian cities and villages is one of its most important strength factors.

Civil society organizations in Jordan include 12 bodies of social organizations spread all over the regions of the kingdom, namely: political parties, professional unions, labor unions, social and charitable societies, environmental organizations, sports and youth clubs, human rights and democratic development organizations,

women's organizations, employers' organizations, protection and health care associations, and what is known on behalf of organizations on the edges of civil society [5]. In As-Salt city, a number of different civil society organizations emerged and diversified into various fields of work. These include charities, associations dealing with youth, sports, women and children affairs, cultural and tourism associations, and centers playing significant roles on how to preserve and protect the urban heritage in the city. This responsibility does not fall on the state or a specific entity only, but all individuals, regardless of their positions and roles. Each individual must contribute to the task of preserving the cultural heritage of the city, and with this collective concept of responsibility, society can achieve and sustain this task.

1.1 Research problem

Civil society organizations are the organizational framework for supervising and educating community members, with the aim of integration and participation in activating volunteer work in society and active participation in various societal issues, including the preservation of urban heritage. This is achieved through working to educate individuals and prepare them to be ready to face the dangers to which monuments and historical buildings are exposed. Locally, interest in the role of community organizations as a partner in change, development, and development at all levels and in various fields has escalated, as a key partner in the process of economic growth, development, education reform, and finding appropriate solutions to social issues facing society (Al-Arifi, 2012).

The Canadian Heritage Center [6] affirms that the concept of urban heritage is broad and encompasses the natural and cultural environment that includes natural landscapes, historical places, cultural sites, buildings, environmental diversity, and past and present cultural practices. It also includes the knowledge that society has acquired in the past and present, and its current life experiences. Heritage is a record of the processes of historical development, and it expresses them to form the essence of national, regional, and local identity to become part of contemporary life.

Urban heritage is a concept that is always characterized by instability as clear and continuous changes occur to it resulting from the effects of society on the set of components of the urban heritage. Through this vision, it is assumed that there is a need to approach the concepts of urban heritage from a different point of view that requires concerted efforts, whether at the educational, political, or social level, in order to develop an action agenda capable of contributing to the preservation of urban heritage. Through this study, we try to answer the main question: What is the role of civil society organizations in As-salt city in protecting the urban heritage? What are the challenges that stand in the way of that?

1.2 Research hypothesis

The study postulates that civil society organizations have a major role in preparing and planning programs and projects and implementing policies that protect antiquities, historical buildings, and urban heritage in As-Salt city. Thus, it is assumed that these organizations play an important role in the field of tourism development and preservation of antiquities as antiquities represent the material aspect of civilization and an important material source of national income.

1.3 Significance of the study

The importance of this study stems from the great role that civil society organizations play in preserving the heritage, protecting it from deterioration, tampering and extinction, and avoiding exposing it to danger, spreading awareness among all segments of society in order not to trespassing on monuments and historical buildings. Thus, this study will contribute to the field of scientific study and enrich scientific knowledge in the field of urban heritage.

It is hoped that the following will benefit from the results of this study:

- Society, as this study can provide in terms of spreading community awareness about the process of community participation, the importance of teamwork, in addition to developing, developing and expanding areas of cooperation and participation in various fields.

- Researchers: This study would constitute an informational base and an important point for conducting other studies and research on the subject of the study with the aim of achieving its comprehensive development concept and opening new horizons and scopes to address the protection of urban heritage and the contribution of civil society in its protection.

- It is expected that this study, through its results, will enrich the Arab library in general and the Jordanian library in particular by adding a process on the subjects of the study.

1.4 Aims of the study

This study aims to identify the role of civil society organizations and organizations in preserving and protecting the urban heritage from encroachment, protecting it from deterioration, tampering and extinction, and avoiding exposing it to danger. The study also introduces some methods, techniques, and programs to protect and secure the urban heritage from risks and how to protect them through our study of a model in As-Salt city in Jordan. The study also aims to enrich the theme of urban heritage and its cultural and historical importance to the nation and the cultural status, and it represents of a cultural status contributing to the overall cultural and economic balance.

2. Literature review

2.1 Civil society in Jordan

Civil society is principally an intertwined fabric of relations that are established between its members on the one hand and between them and the state on the other hand. These relationships are based on the exchange of interests and benefits, contracting, compromise understanding, disagreement, rights, duties, responsibilities, and holding the state accountable at all times when it is necessary to hold it accountable [7].

Kandil believes that civil society represents the totality of voluntary, nonhereditary, and nongovernmental social organizations that nurture the individual and

maximize his ability to participate in public life. Civil society organizations play an intermediary role between state organizations and heritage organizations. This definition excludes the relationships based on family or clan bases, which are referred to as hereditary.

Millawi [8] states that there are a number of terms given to civil society organizations such as civil organizations, nongovernmental organizations, charitable organizations, nonprofit organizations, voluntary organizations, and volunteer work organizations. In France, for example, it is called social economy, in Britain, it is called public charities, in Germany, it is called associations and unions, and in Japan, they are referred to as public interest institutions. Tlilan [4] defines civil society organizations as voluntary political, economic, social, and cultural organizations, which operate in multiple fields and independently of the authority of the state and seek to achieve multiple purposes such as participation, upbringing, defending their goals and the interests of their members, spreading cultural awareness, and contributing to overall development.

Jaribae [9] argues that civil society is a group of free and voluntary organizations that are established to provide services to citizens, or to practice various humanitarian activities and are committed in their existence and activity to the values and standards of respect, compromise, tolerance, participation, and the peaceful management of diversity and difference.

The expansion of community organizations within a particular country, their supervision of multiple sectors, and their contribution in managing various fields is considered a positive indicator of the extent of the state's development, and its ability to absorb individual and community initiatives emanating from informal bodies, to serve vital projects in the country. The legitimacy of the participation of community organizations in public life is not an intellectual luxury, but rather there are constitutional rules and international commitments that establish this participation, give it a legal dimension, and give it a legitimacy [10].

The importance of the role of community organizations stems from the investment in creative human energies, contributing to building a society based on deep moral values. Community organizations provide any society with strong foundations for building democracy, achieving social justice, helping individuals achieve their aspirations by positively influencing public policies in the fields of education, health and human rights, supporting anti-corruption policy, and solving problems facing society in its various sectors [11].

2.2 Strengths and weaknesses of civil society organizations in Jordan

The spread of community organizations in Jordan in many Jordanian cities and villages is one of its strengths, which generates knowledge of the environment (people, culture, and customs), building good relationships with society, motivation and ability to participate, and the developmental impact that community organizations have on individuals, which includes developing and building their capabilities. In addition, community organizations are also sources of information for society and individuals, and they can provide education for individuals on general values such as participation, concern, tolerance, respect for human rights, and rejection of violence. What increases the points of strength are the state's political interest in civil society and its various organizations and the political, social, and economic openness. Jordan's signing of international agreements that helped the growth of civil society organizations in addition to their diversity and specialization

in various fields enriches and increases the strength of society. Civil society organizations play an important role in communication between individuals and organizations teaming up to achieve their goals, serve the community, and solve its issues. In addition, the multiplicity of community organizations in their directions, goals, and the field in which they work gives them a social advantage in resolving issues facing society [7].

There are a number of weakness points in community organizations, including the influence and affiliation of some organizations with political parties and religious currents. This makes them lose their independence and credibility in field work. Some organizations function for purely commercial and personal activities for the purpose of material gain and other facilities because of some financial difficulties and criticism of some organizations. One of the negative aspects is also the conservative nature of Jordanian society, especially in the areas outside the capital Amman. The conservative nature of society hinders the participation of women and youth in these organizations. In addition, the unstable economic and political conditions in the region affects the state's relationship with organizations and the nature of their work [9].

In As-Salt city, civil society organizations working in the field of tourism and culture are many and diverse, including As-Salt Reconstruction Foundation, the Jordanian Society for Heritage Preservation, the Fine Artists Association, Al-Khader Street Forum for Culture and Arts, As-Salt Cultural Association, As-Salt Cultural Club, Friends of Tourism Association. The following **Table 1** shows the organizations with their year of establishment:

2.3 The urban heritage in As-salt

As-Salt city is characterized by its old neighborhoods with a unique architectural character built of yellow stone dating back to the golden age of the city between 1890 and 1920 (**Figure 7**). Due to the nature of the area, which is composed of rugged mountain ranges, these neighborhoods were formed in a way that is akin to cumulative construction between narrow streets and connected stairs, characterized by window openings and skillfully carved door arches [12].

Before 1866, the buildings were of a single storey made of clay and coarse stone, and ceilings carried on tree trunks. After that, the city was influenced by the urban line in the city of Nablus—Palestine, where the floors were multiplied and yellow

The organization	Year founded
As-Salt Reconstruction Foundation	1982
The Jordanian Society for Heritage Preservation	2002
The Fine Artists Association	1977
Al-Khader Street Forum for Culture and Arts	2020
As-Salt Cultural Association	1989
As-Salt Cultural Club	2006
Friends of Tourism Association	2017

Source: Authors.

Table 1.
Civil society organizations working in the field of tourism and culture in As-salt city.

Figure 7.
The urban heritage in As-salt.

stone was introduced as a basic component of the city's architectural facades, with sculptural details such as protrusions, in addition to the use of domes and arches.

From 1890 to the First World War, the city was influenced by the European character, where tiled roofs, steel beams, and balconies appeared. After the emergence of reinforced concrete and the entry of imported materials into construction, the city developed in a rapid way so that it contained more than 2000 heritage buildings. However, the city was affected in 1927 by the earthquake that struck the region. In addition to the migration of the population to Amman and the development of infrastructure and the increase in the use of concrete in construction, only about 850 buildings remained of these heritage buildings built of yellow stone, which distinguished them from other cities in the kingdom [13].

2.4 Policies for the preservation of urban heritage

The urban heritage of nations is one of the most important determinants of the identity of society and distinguishes it from other societies as this concept includes several material and moral components that basically form the image of society in front of other societies. The urban heritage of nations is one of the most important elements that determine the identity of society and its distinction from other societies as this concept includes several material and moral components that form the basis for the image of society in front of other societies. Therefore, working to identify the components of urban heritage in societies is important and requires devoting effort, time, and money as urban heritage is reflected in the identity of society and the personal identity of its members, which means that working on determining the role of urban heritage in shaping identity is an important matter that needs a lot of study and research. Since it forms the basis for understanding the components of heritage identity [14].

Heritage is one of the most important determinants of cultural identity in societies as it contains material and non-material topics of value that have been inherited from

previous generations, in addition to the contributions of civilization at the present time. Heritage includes several components, the most important of which are tourist attractions and natural places. Ecosystems and traditional cities, which necessitates the need to preserve these heritage components in order to pass them on to future generations [15].

The United Nations Educational, Scientific and Cultural Organization (UNESCO, 1972) indicated during the first conference on the preservation of human urban heritage that this concept includes several components that can be developed as follows:

1. Cultural monuments, which include buildings, engineering works, statues, sculptures, paintings, manuscripts, drawings on cave walls, or any artwork of value from the point of view of historians, artists, and scientists.

2. Buildings that comprise a single building or a group of buildings linked with each other and that can be described due to their engineering construction or location as of national and global value from the point of view of historians, artists, and scientists.

3. Places, which include human works or natural phenomena that both nature and man contributed to building or drawing, in addition to historical places of cultural value at the national and human levels.

4. Natural features, which consist of physical and biological formations or any of the natural elements that contributed to building natural features of esthetic or scientific value.

5. Geological features, which constitute the natural environment for some animals or plants that are threatened with extinction and can be considered valuable from the point of view of scientists and conservationists.

6. Natural places, which are considered areas that contain a large group of natural living organisms and can be considered as valuable.

The first criterion for listing a historical site of heritage is the temporal criterion, which means everything that the elements or components were older the higher the heritage criterion, and the second criterion is the technical criterion, that is, the criterion that has to do with architecture, architecture is an artistic system as it has certain dimensions and patterns of (openings, facades, elevations, doors, and urban spaces) where these elements are considered the visual and material incubator in which a person lives to practice his activities, and the third criterion is the set of social, economic, and environmental values; For example, a specific tribal guesthouse, where tribal meetings must take place or a specific decision was issued that affected the future of the region or its planning, and the environmental criterion, which is the amount of urban response to environmental conditions, and the fourth criterion is the symbolic criterion, such as the association of areas, buildings or roads with a specific event, such as Al Ain Square in the city of Salt, Al Ain Square in the city of Salt is a (space) that does not have buildings and Al Ain Square has gained its importance because it has a symbolic value from the gathering of individuals around the springs of water in the past, and also gather them to play popular games in our time, and based on the above, and with reference to the city of Salt, all the previous criteria are available in

Figure 8.
A strong dimension in the classification of the city of salt is the architectural standard in the city center.

the city of Salt despite the availability of all four values that make the city of Salt a heritage city with distinction, one of the things that exist now in a remarkable and distinct way and took a strong dimension in the classification of the city of Salt is the architectural standard in the city center (**Figure 8**), which is represented by many distinguished buildings in the city of Salt, where the number of heritage buildings reached 657 buildings [3].

The urban heritage consists of two main elements: the tangible urban heritage, and it is expressed through works of art, paintings, sculpture, buildings, and tourist attractions. As for the intangible urban heritage, it is the means that expresses the cultural diversity in society. Its importance lies in the fact that it is based on the technical knowledge and skills that have been passed on in society from one generation to the next. Thus, the intangible urban heritage is the unwritten societal experiences and knowledge that have contributed significantly to the cultural level of society reaching what it is [16].

There are various policies for preserving urban heritage, as follows [17]:

Protection: This type of policy is limited to historical or archeological spaces, and sometimes followed by modern areas of a distinctive character, and the protection is for certain buildings, the urban fabric, or the architectural character, and sometimes it expands to include the protection of the social and economic structure along with the urban structure.

Maintenance: The process of dealing with damage or defect in the building that actually occurred or is likely to occur, and that is by the applicable means, and aims to improve the general appearance of the building, and it is a periodic work that must be carried out on an ongoing basis to preserve the building.

Restoration: It means any intervention aimed at restoring the efficiency of an act of human activity, and the restoration process aims to restore historical buildings and areas to their original condition when they were constructed.

Reconfiguration: Reassembling parts of a historic building, either in the original place or in a new place, as it is considered a national monument.

Reuse: The process of re-employing buildings of archeological and historical standards in new uses that are appropriate to the current development and at the same time ensuring the continuity of life of those buildings and preserving them in a practical way. This process poses no danger to the archeological origin or any conflict with the values or principles of society.

Renewal: The use of public funds to support an initiative aimed at improving disadvantaged populations or places.

2.5 Contribution of civil society organizations in the city of salt in the protection of urban heritage

Efforts were organized through the signing of a memorandum of understanding between the Tourism Directorate, As-Salt Reconstruction Corporation, and the greater As-Salt Municipality that resulted in several administrative committees. The first committee was assigned to manage the great museum (downtown Al-Salt) tourism. As-Salt Reconstruction Corporation and the Tourism Directorate are responsible for this committee. Another committee is responsible for organizing the activities of the local community and the services they provide to tourists. This task is carried out by As-Salt Reconstruction Foundation as a civil society institution concerned with community development.

Civil society organizations in As-Salt city are redoubling their efforts to spread awareness of the value of heritage. They are also undertaking educational efforts to form a social base that embraces the idea of caring for heritage and antiquities and caring for them, working to consolidate their value in the minds of different sects and social classes, and to bring about a qualitative shift in people's view of heritage by highlighting its historical value. The Jordanian society for the preservation of heritage prepared the famous traditional and heritage game championship in As-Salt city, which is known as (Mancala).

A number of organizations have organized festivals and heritage events and set up programs and projects that explain the professions and crafts of the pioneers and their handicrafts. They also exhibited the products of various folk arts, races, and local games, such as the annual heritage knights festival, which is held by the Friends of Tourism Association in cooperation with the Balqa Tourism Directorate, the Cultural Book Knights Association, and As-salt Reconstruction Foundation. They also organized tours for visitors from outside the city and received tourists in the city's heritage houses.

The urban heritage was also immortalized by organizing various exhibitions, such as exhibitions of old and rare photographs, which chronicle this heritage and these antiquities according to the years they were taken. These are also compared with the present reality, to realize the extent of the changes and transformations that have occurred in the region, the repercussions, effects, and consequences of the modernization movement, urban and industrial growth on the heritage, and environment of this region. This is what the Fine Arts Association in the city does on an ongoing and regular basis as it annually attracts fine artists from the Arab region to hold an art exhibition in As-Salt city. The continuous emphasis through seminars, workshops, and meetings indicates that the issue of protecting heritage and the environment is not an intellectual luxury, but rather a national duty that must be fulfilled for developing the citizen and improving his standard of living, ensuring stability and a decent life. Annually, the Fawasil Foundation for Civil Society Development, in cooperation with As-Salt Reconstruction Foundation, holds As-Salt Spring Cultural Festival. The capacity-raising program for workers in the tourism sector was also carried out in cooperation between As-Salt Reconstruction Corporation and the Vocational Training Corporation. Al-Khader Street Association for Culture and Thought and As-Salt Cultural Forum are holding ongoing workshops and seminars related to preserving heritage in As-Salt city.

2.6 Challenges facing civil society organizations in As-salt toward protecting the urban heritage

The most important challenges facing the Jordanian antiquities in general, and in the As-Salt in particular, are urban expansion, heavy machinery, and the establishment of random housing plans. In addition, the reactions of some toward the antiquities, because they were prevented from building or maintaining their homes located in the sites of the archaeological areas form also substantial challenges. Also, one of the most important challenges is the lack of clear data and an information base that provides civil society organizations operating in the city with the necessary data about the number of visitors, the places of their tours, and the duration of their stay in the city. In addition, civil society organizations are not involved in the development and restoration of heritage houses, a task that is only borne by government institutions.

The reuse and employment of archeological sites and historical buildings compatible with development and tourism projects in the city are carried out by individuals or organizations from outside the city that have obtained financial support from international donors or through government institutions. Most of the financial support operations related to this field go to organizations from outside the city, and it does not require that the organization be from within the city and operate in the city. This wastes job opportunities, investment, and financial return for civil society organizations operating in the city.

Moreover, there are no measures that determine the long-term consequences of projects related to the renewal and protection of urban heritage in the city. The city has no clear idea or plans for keeping it on the list of UNESCO heritage cities. This is a failure on the part of the government agencies responsible for protecting the urban heritage in the city. Organizations working in the city are not directly involved and informed of the most important and latest developments in this matter. More importantly, there is a lack of social awareness among citizens in taking responsibility for civil work, and the severe shortage of volunteers to work with these organizations, whether in tourism projects, or developmental and cultural projects in general.

3. Methodology and procedures

In this study, the exploratory approach was used as it is the most appropriate for the subject of the study. The data was collected through an unstructured telephone interview, which included open-ended questions to which the respondent answered using his own expressions. Interviews were conducted with the heads of cultural and tourism associations and associations concerned with the renewal of urban heritage in As-Salt city. The number of participants was 12, chosen using the purposive sampling method. The interviews were recorded after obtaining the sample's permission for quality purposes in the interviews, and then these interviews were transcribed into written texts, after which a cross-cutting analysis was conducted for all the interviews together by extracting the main ideas to cover the main axes of the interview. Then, the general themes were adopted after reviewing the studies related to the subject of the study. The themes were as follows:

- The first axis: The contributions of civil society organizations in the city of Salt in the protection of urban heritage.

- The second axis: The challenges facing civil society organizations in the city of As-salt toward protecting the urban heritage

3.1 The validity of the tool

The mechanisms of validity in qualitative research differ from quantitative research, and this is determined by the subject and problem of the study. McMillan and Schumacher [18] indicate that reliability in qualitative research can be expressed in the compatibility of meanings of interpretations and concepts between the researcher and the participants, that is, the degree of proficiency of the researcher and the participants in describing the goals, their components, and their meanings. The validity refers to the level or accuracy of measuring and correctly recording observations as intended to be measured. The researcher relied on estimating the accuracy of the responses obtained during the interviews to ensure the validity of the data provided by the participants.

3.1.1 Stability of interviews

To ensure the stability of the interviews, two interviews were selected and presented to the heads of cultural and tourism associations and clubs who were interviewed, and they agreed with what was stated in the text of the written interview.

4. Results and discussions

From the foregoing, it is evident that civil society organizations can make a real contribution to development if they are able to build developmental awareness and employ it through positive participation in the development process. In addition, there are many civil society organizations in As-Salt that are doing their best to promote a culture of voluntary work in the community, such as working in the fields of training for the protection of antiquities. They also contribute to the revival of the cultural heritage, communicate and participate with local and international organizations in this regard. The following conclusions can be drawn and a number of proposals and recommendations can be made, as follows:

4.1 Findings

Despite the great desire on the part of civil society organizations operating in As- Salt and related to their work in the cultural and tourism field to continue voluntary work, the work done does not reflect the actual role that civil society organizations must play in supporting and protecting the urban heritage when compared to some developed world countries. This is due to several reasons, including, for example, the recent establishment of these organizations, the idea of volunteering in the life of Jordanian society, lack of field experience, and the less concern culture regarding the importance of nongovernmental organizations. Hence, there is an absence of major organizations that assume a fundamental role in a specific field, similar to other effective organizations in the world.

Inadequate financial aid generates difficulties for civil society organizations, especially those that suffer from poor funding, to carry out operations related to the protection of urban heritage and the reuse of heritage buildings. Weak societal culture toward volunteer work and the work of civil society organizations, leading to a shortage of volunteers and reducing popular participation in private civil work in the field of urban heritage protection. There is a lack of government support and cooperation between the official authorities responsible for protecting urban heritage and the civil society organizations operating in As-Salt city.

Based on the results, it is, therefore, imperative to establish a coordination between civil society organizations and official institutions on issues of preserving urban heritage, with a single and comprehensive control and vision to ensure the unification of efforts through dialogue, coordination, and cooperation, and the exchange of views and information in everything related to programs of maintenance, restoration, and preservation of historical sites. It is also important to raise archeological awareness to the extent required to involve the citizen in protecting antiquities by activating popular oversight. Archeological awareness prepares the individual and creates the climate for protecting the urban heritage. It is one of the important measures in the civilization of nations. By the absence of this awareness, the urban heritage can be wasted.

There is a need to establish a database with the necessary statistics along with developing an implementation plan for media programs to educate community members on the importance of civil work. In addition, the results suggest the need for initiating communication and participation between local and international organizations related to the protection of urban heritage and finding ways of effective partnership among them. Attracting experts to support the activities and programs of the organization for the benefit of As-Salt city is also significant. They would be able to provide advice and technical support and work on developing tourism projects aimed at preserving urban heritage, such as digitizing heritage buildings within electronic applications based on virtual and augmented reality.

5. Conclusion

In this book chapter, the aim was to identify the role of civil society organizations in protecting the urban heritage in As-Salt city in Jordan. The results reveal that the work done by concerned organizations does not reflect the actual role that civil society organizations must play in supporting and protecting the urban heritage when compared to some developed world countries. There is a lack of awareness of the importance of nongovernmental organizations. The perception of volunteer work is still not fully developed, leading to a shortage of volunteers and reducing popular participation in private civil work in the field of urban heritage protection. More importantly, there is a lack of government support and cooperation between the official authorities responsible for protecting urban heritage and the civil society organizations operating in As-Salt city.

Author details

Shatha Sakher[1] and Kabila Hmood[2*]

1 Al-Balqa Applied University, As-Salt, Jordan

2 Faculty of Architecture and Design, Department of Architecture, Al-Zaytoonah University of Jordan, Amman, Jordan

*Address all correspondence to: khmood85@gmail.com; kabila.f@zuj.edu.jo

IntechOpen

References

[1] Alhammad F. Residents' attitudes towards tourism development in AL-Salt City, Jordan. Canadian Social Science. 2012;**8**(1):152-163

[2] Al-Habis M. Heritage buildings and urban identity of the City of salt-Jordan. The Jordanian Journal of History and Antiquities. 2011;**5**(1):91-116

[3] El Faouri BF, Sibley M. Heritage-led urban regeneration in the context of WH listing: Lessons and opportunities for the newly Inscribed City of As-salt in Jordan. Sustainability. 2022;**14**:4557. DOI: 10.3390/su14084557

[4] Talilan, O. The Impact of Civil Society Organizations on Strengthening the Constitution in the Framework of the Process of Transition towards Democracy in Jordan (1989-2012). Al-Manara Magazine. Jordan: Al Albayt University; 2013;**4**(19):226-258

[5] Al-Khatib J. Civil society organizations and trade unions (general scene). In: Symposium on Trade Unions and Civil Society Organizations in Jordan. Amman: Al-Quds Center for Political Studies; 2003; 24-25. pp. 139-151

[6] Canadian Heritage. Cultural-Heritage Tourism: Review of Existing Market Research. 2008. Available from: http://www.pch.gc.ca/pcch/pubs/tourism/documents/2006-05/4_e.cfm [Accessed: January 21, 2008]

[7] Sakher S, Al Zubaun M. The reality of community participation between Omani and professional trade unions and Jordanian universities from the viewpoint of professional and labor union members and academic leaders in Jordanian universities to confront university violence. Studies, Educational Sciences. 2019;**46**(1):377-397

[8] Malawi A. The importance of civil society organizations in development. Damascus University Journal of Economic Sciences. 2008;**24**:255-275

[9] Al-Jaribee M. Civil Society and the Jordanian State, Transitioning from the Scepticism Square to the Participation and Trust Square. Jordan: Al-Thuraya Center for Publishing and Distribution; 2014

[10] Speke A. Arab international efforts in the field of developing the contribution of civil society organizations in the issue of comprehensive security. In: Scientific Forum, Civil Society Organizations and their Role in Fortifying Comprehensive Arab Security. Riyadh: Prince Nayef Arab University for Security Sciences; 2011

[11] Dweik A. Civil society organizations and their relevance to issues of comprehensive security: Human rights and the promotion of intellectual security. In: Scientific Forum, Civil Society Organizations and their Role in Fortifying Comprehensive Arab Security. Vol. 28. Riyadh: Prince Nayef Arab University for Security Sciences; 2011. pp. 30-37

[12] Alamoush S, Kertész A. Accessibility as a factor for a livable cities: The case of Salt City in Jordan. Pollack Periodica. 2022;**17**(3):147-151

[13] Khreisat M. Studies in the History of As-Salt City. Amman, Jordan: Ministry of Culture; 1997

[14] Sakher S, Muqabla R. The role of cultural heritage in preserving Arab cultural identity from the viewpoint of

faculty members in Jordanian public universities. Journal of Social and Human Sciences, University of Batna. 2019;**20**(1):103-124

[15] Atkins R. Cultural and Natural Heritage. New Jersey, USA: Prentice Hall; 2017

[16] United Nations Educational, Scientific and Cultural Organization. Intangible Urban Heritage. New York, USA: Report issued by the United Nations Educational, Scientific and Cultural Organization; 2011

[17] Shehata AM. Current trends in urban heritage conservation: Medieval historic Arab City centers. Sustainability. 2022;**14**(2):607. DOI: 10.3390/su14020607

[18] McMillan JH, Schumacher SS. Research in Education: A Conceptual Introduction. New York: Longman; 1997

Chapter 2

Constructing New City Downtowns: A Solution for Preserving the Historical Urban Heritage

Mohammadreza Hajialikhani

Abstract

Historic city centers usually include historic buildings and sites. As the size and the population of the cities increase, the price of land and real estates in the cities and, respectively, in the downtowns increases. This results in more demand for commercial buildings in city downtowns. In cities with historical and heritage urban areas, the mentioned demand may result in the demolition of heritage historical urban to be substituted by new modern buildings. A solution to this problem is constructing new city downtowns in unused, secluded, or abandoned lands or areas as regeneration megaprojects, which has been implemented in many cities worldwide during the last three centuries. But this solution also faces different challenges and needs specific arrangements. By reviewing lessons learned from some of the worldwide urban regeneration projects, this paper discusses the proposed arrangements to increase the chance of success in the mentioned megaprojects and summarizes them in three main categories as, proper planning and execution, proper institutional arrangements, and public-private cooperation.

Keywords: cultural heritage, urban heritage, city downtown, heritage management, urban regeneration, preservation

1. Introduction

During the human civilization, most cities are historic small cities that grow up due to the increase in population and economic opportunities. Ancient cities like Rome, Paris, London, Athens, Beijing, New Delhi, Mumbai, Tehran, Isfahan, Istanbul, Cairo, New York, and many other cities are example of large cities (Metropolises) that have gradually become larger and more populated during centuries and even millenniums. Large cities are attractive for people due to their facilities and opportunities for occupation, studying, living, entertainment, etc.

In 2020, more than 30% of the global population live in metropolises with 300 thousand inhabitants. In 2020, nearly 85 metropolises inhabit by more than 5 million population [1]. Rising population and uncontrolled urban land consumption rates

have been responsible for the rise of bigger and denser cities and metropolises [1]. Large cities are becoming the major pattern of global human settlements and are the main engine of economic development, which attract people for jobs, creates the highest values, and are the main support for the globalization process [2].

2. Historic urban heritage

The historic urban landscape is the urban area of a historic layering of cultural and natural values, extending beyond the notion of 'historic center' or 'ensemble' to include the broader urban context and its geographical setting [3]. As the size and the population of the cities increase, the economic value and the price of land and real estate in the cities and, respectively, in the downtowns increase. This results in the more demand for commercial space and, therefore, more demand for high-rise buildings in city downtowns, which are usually historic urban in metropolises.

The historical centers are most likely the undesirable consequence of growth and rapid technological advancement, with a range of environmental and developmental challenges [4]. The rehabilitation and conservation of historic city centers are major sources of change. Furthermore, urban regeneration of historical city centers also promotes social interaction between inhabitants of the city, and the adoption of its urban spaces encourages public activity [4].

In cities with historical heritage urban areas, city managers have different choices for managing rapid growth, whether to protect their urban heritage or let new development take its place [5]. But the mentioned demand sometimes results in demolition of heritage historical urban to be substituted by newly built modern buildings.

3. Construction of new city downtowns, a historic review

Instead of demolition of historic centers of cities, what would be the other choice to respond to the increasing demand for commercial and residential buildings? Every city has many underused and underutilized land or decaying urban areas that weaken the city's landscape, livability, and productivity [5]. Construction of new city downtowns rooted in historical planning efforts, examples of which are presented below:

3.1 Isfahan, Iran

In the seventeenth century, the capital of Iran was relocated from Qazvin to Isfahan during the Safavids dynasty. Isfahan used to be the capital of Iran till the tenth century A.D., Therefore, it was a major developed city. But after five centuries, it needed considerable construction to adopt the new government buildings and urban planning to be the capital again. The traditional method was to demolish the old urban and reconstruct new urban buildings. But Iranian engineers and government decided to avoid demolishing and construct a new city center with a newly planned complex consisting of the main square, the King's palace, Mosques (religious center), and the Bazar (economic center). The complex is named Naghsh-e Jahan square (newly known as Meidan Emam). The new complex was planned to be located in the wastelands surrounding the city but connected to the old urban of the city by the Bazar (**Figure 1**).

The city planners at that period decided to construct a new city complex nearby the old one in remote areas and connected it through a long Bazar (city market) that

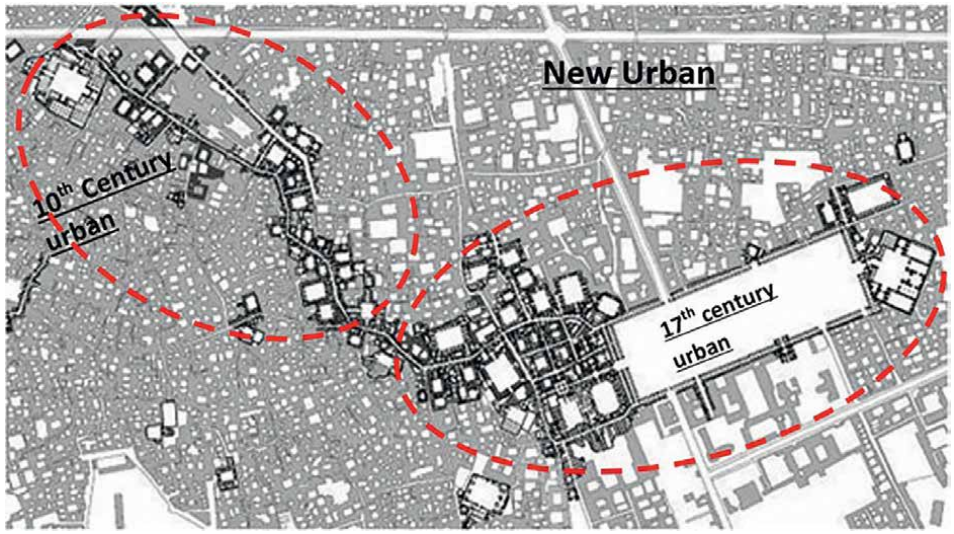


Figure 1.
The seventeenth century Isfahan city center vs. the tenth century one.

was constructed from the old urban to the new urban. This helped the government to avoid the cost of demolitions and relocation of people. Since the new complex was beside the city, logistics (transportation of manpower and material) was cheaper. Also, there was not any constraint for new construction. Therefore, a very nice architectural complex was constructed to be the 1st historic monument of Iran, which was registered in the world heritages Convention of UNESCO (**Figure 2**). The project was a megaproject for the period and was funded by the government at that time.

3.2 Istanbul, Turkey

Constantinople was the capital of the Eastern Roman Empire (also known as the Byzantine Empire) from 330 to 1204 A.D. It was also the capital of Latin Empire (1204–1261), again the capital of Byzantine Empire (1261–1453), and then the Ottoman Empire (1453–1922). Following the Turkish War of Independence, the Turkish capital then moved to Ankara. It is officially renamed Istanbul in 1930, and the city is today the largest city and financial center of the Republic of Turkey (1923–present). Therefore, the grand Bazar (main market) has been the financial center of the city for centuries. In the twentieth century, modern construction has been implemented and the economic and financial urban were constructed in new areas in Istanbul, such as Levent, Maslak, and Şişli financial districts, which are the home to the headquarters of Turkey's largest companies and banks and financial sector. Therefore, the grand Bazar was renovated and nowadays is just a tourist attraction in Istanbul. In fact, in its new role as a tourist attraction, it is one of the most attractions with more than 90 million visitors per year (**Figure 3**). This method is continued and the Istanbul Finance Center, the latest Turkey's new economic hub, is under construction and opened partially in 2022 and is planned to construct 300.000 m^2 of modern buildings (**Figure 4**).

In fact, the construction of new economic and financial centers in Istanbul saved the grand Bazar and the surrounding historic urban from demolition and reconstruction.

Figure 2.
The seventeenth century Isfahan city center (Naghsh-e-Jahan Square complex).

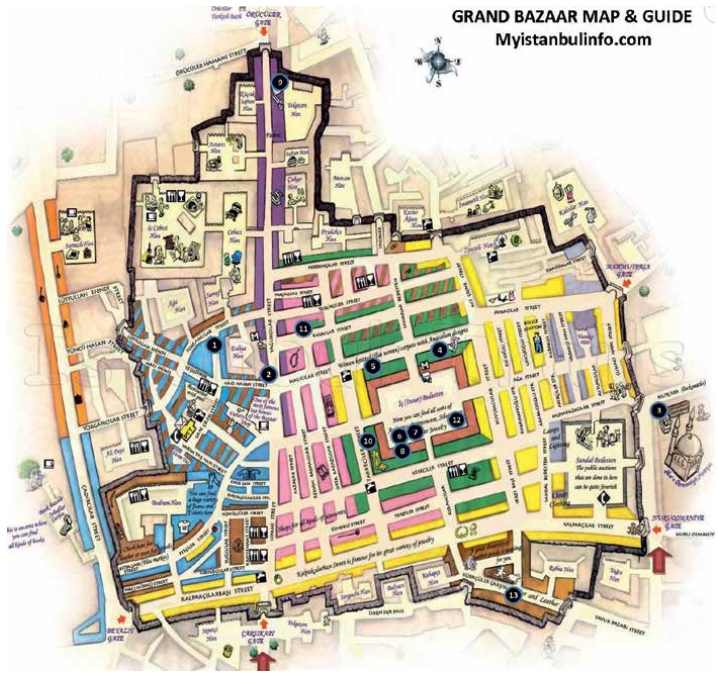


Figure 3.
Istanbul Grand Bazaar in historical urban.

Figure 4.
Istanbul financial center.

3.3 Puerto Madero, Buenos Aires, Argentina

Puerto Madero Waterfront is a neighborhood of Buenos Aires (Argentina), placed in the central business district, on the Río de la Plata riverbank, and represents the latest architectural trends. The city of Buenos Aires always had a problem accommodating large cargo ships, because the shallow river did not allow for direct docking. In the late nineteenth century, the national government contracted local businessman to take charge of the construction of a new port to solve these problems. It was a costly project and an engineering landmark at the time. But 10 years after its completion, the appearance of larger cargo ships made Puerto Madero obsolete (**Figure 5**).

In the 1990s, local and foreign investment led to a massive regeneration, recycling, and refurbishing of the west side warehouses into elegant houses, offices, universities, luxurious hotels, and restaurants for this new district in a city that grew up turning its back to the river. Luxurious hotels, state-of-the-art multiplex cinemas, theaters, cultural centers, and office and corporate buildings are located mostly on the east side (**Figure 6**). By 2010, a total of 2.25 million m^2 of space had been built in Puerto Madero. Public and private investment till 2009 was USD 1.7 billion and was estimated to reach USD 2.5 billion upon project completion [6].

3.4 Melbourne Docklands, Australia

Melbourne Docklands was a swamp land that became a bustling dock area in the 1880s, as part of the Port of Melbourne (**Figure 7**). It had an extensive network of wharfs, heavy rail infrastructure, and light industries. By increase in container shipping traffic, Docklands was virtually abandoned by the 1990s. The construction of Docklands Stadium in the late 1990s attracted interested developers, and urban renewal began in 2000 with several independent privately developed areas. Docklands subsequently experienced an apartment boom and became a sought-after business address (**Figure 8**). The suburb is known for landmarks and is also home

Figure 5.
Buenos Aires Harbors.

Figure 6.
Puerto Madero, Buenos Aires.

to a number of heritage buildings, retained for adaptive reuse. Docklands is one of Australia's largest urban renewal projects, reconnecting central Melbourne with its historic waterfront. Docklands comprise a number of precincts, each with a diverse

Figure 7.
Melbourne Docklands in 1997.

Figure 8.
Melbourne Docklands (Today).

variety of residential, commercial, retail, and leisure spaces. It is a 15 billion USD project including more than 1 million m^2 of commercial office space completed, or under construction, and includes 17,000 residences, of which, more than 60% are completed [7].

The size of the Melbourne Docklands project required political influences and the government's support [8].

3.5 Canary Wharf, London

From 1802 to the late 1980s, Canary Wharf was one of the busiest docks in the world (**Figure 9**). It is an area of London, located in the London Borough of Tower Hamlets.

In the 1990s, a regeneration project was implemented and, nowadays, it is part of London's central business district, alongside central London. It is one of the main financial centers in the United Kingdom and the world [9], containing many high-rise buildings (**Figure 10**). The area was developed on the site of the former West India Docks, containing around 1,500,000 m^2 of office and retail space. It is the home of the world or European headquarters of many major banks, professional services, and media firms.

3.6 Titanic Quarter, Belfast, Ireland

Belfast's Titanic Quarter is one of Europe's largest urban waterfront regeneration projects. Over 700 USD million has already been invested. Titanic Quarter is home to over

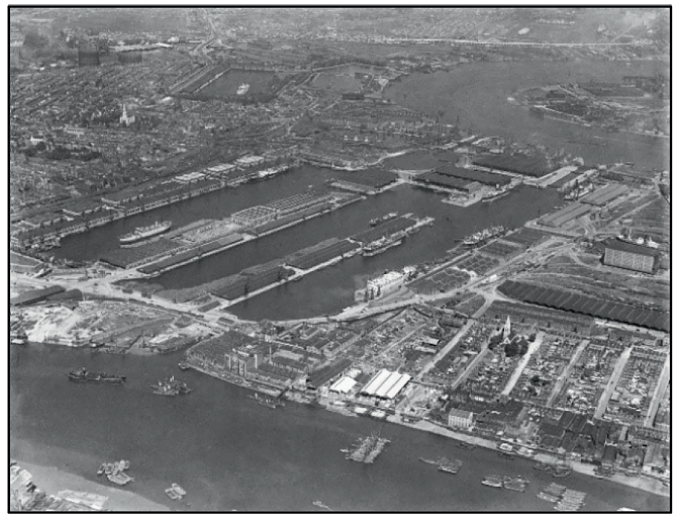


Figure 9.
Canary Wharf (early twentieth century).

Figure 10.
Canary Wharf (Today).

Figure 11.
Harland and Wolff shipyard (early tweniteth century).

Figure 12.
Titanic quarter (today).

100 national and international businesses. The 75-ha site is part of the Harland and Wolff shipyard, the company that made the famous Titanic ship (**Figures 11** and **12**) [10].

Titanic Quarter is Northern Ireland's most internationally known regeneration opportunity. Titanic Quarter has a proven track record, having already attracted more than 700 million USD of investment for the construction of some 170.000 m^2 of mixed-use development during the last decade and has a plan for a further 400.000 m^2 of development.

4. Discussion

Urban population is increasing all over the world and the demand for more residential and commercial buildings, shops, and malls is increasing yearly. In the nineteenth and twentieth centuries, demolition and reconstruction of old heritage buildings in city downtowns happened, mainly in developing countries.

But every city usually has unused, secluded, or abandoned lands or areas that may be regenerated to provide extra residential and commercial areas to afford the demand increase due to economic development and population increase.

Samples of these projects were mentioned and many others are constructed or under construction all over the world, such as Ahmedabad (India), Johannesburg (South Africa), Santiago (Chile), Seoul (South Korea), Shanghai (China), Singapore, and Washington DC (United States) [6], etc.

4.1 Required arrangements

In order to be sure about the success of preservation of urban heritage, the city managers shall assure the success of the new urban regeneration project that is planned to be constructed as the new city center (downtown). Success means that

public and private sectors shall be attracted to the new regenerated project, so that the heritage urban be preserved without extra business load and even reduce its business load to just tourist attractions (similar to Istanbul Grand Bazaar).

But all of the above regeneration projects are large-scale megaprojects with construction areas from 200 thousand to more than two million m^2. Therefore, they may face different challenges that make them specific from normal projects and require specific arrangements to overcome the challenges. Major arrangement may be as below (the categorization is extracted and mentioned in the next section "lessons learned"):

Proper planning and execution: The project technical and project implementation plan shall be properly designed and also properly executed to minimize delays and over-budget. This is in fact the easiest challenge of megaprojects and is often technical and there are a lot of solutions for it.

Proper institutional arrangements: These megaprojects are often multi-organizational with diverse public and private sectors whose interactions shape the project path [11]. They face institutional challenges that differentiate them from normal projects [12]. Institutional challenges are challenges due to cultural, political, social, regulative, or normative issues that affect the projects. Historically, the main challenges of constructing infrastructure projects were primarily technical and financial in nature. However, today, one of the greatest challenges of such projects are social and/or political issues [13]. These challenges require proper institutional arrangements to be overcome. Institutional factors have different impacts on megaprojects and their performance. Some of these impacts are direct, such as impact on performance, success, governance, cost, etc. A considerable number of these impacts are studied as indirect factors that affect the performance of megaprojects, such as the impacts affecting the society and surrounding community, project management, creating institutional conflict and challenges between project actors and other stakeholders, lack of institutional knowledge, form of contracts, or the impact on cooperation of partners that consequently impact final megaproject performance [14]. Literature review and also empirical findings emphasized the significance of political factors and their impact on megaprojects. In fact, political elements are due to political behavior or interests of individuals or political parties and impact the megaprojects [15].

Public-private cooperation: There are very few urban regeneration projects that are implemented only by the public sector because they need a lot of financial resources. Very few cities have the resources to finance all of the costs of such large projects. The partnership with the private sector is necessary to share the costs, risks, and technical capacities. Therefore, cities use a combination of internal and external funding sources, policy and regulatory tools, and strategic partnerships with the private sector [6]. These large-scale megaprojects surely cannot be funded only by government or private sector but need both types of investments. Even for rich governments, the authorities shall be sure that there are enough customers for the project. Therefore, participation of the private sector is very important for the success of regeneration projects of underutilizing urban lands [6]. The main reasons for the necessity of joint investment of public and private funds may be mentioned as:

a. The size of investment is large and cannot be afforded only by the governments or private sectors.

b. The joint investment of both sectors may guarantee that the constructed buildings will be sold and, therefore, may increase the success of regeneration project.

4.2 Lessons learned

The World Bank has a study on some urban regeneration projects in Ahmedabad, Johannesburg, Santiago, Seoul, Shanghai, Singapore, and Washington DC and presented some lessons learned from these projects that may be summarized below [6], which emphasizes the challenges and arrangements mentioned above and may be useful for future projects (some of the below lessons learned may fall in more than one category, but it is categorized as per the author's idea):

4.2.1 Planning and execution

Proper vision: Complex regeneration projects are rooted in a powerful, well-thought-out, historically rooted, contextual, long-term, and inspiring vision for the city and the areas that will be the focus of regeneration.

Think long term because urban redevelopment requires forward thinking and planning and is initiated in tandem with formulating a comprehensive master plan.

Consistency in local government ideas and priorities for the project is important, especially in longer-term redevelopment efforts.

Redevelopment of a special area within a larger area as a whole can be helpful in balancing the long-term costs and benefits.

Plan ahead for how best to create an organizational strategy, to give the best chance for success in the long term. There is not one answer or way to do this, and this can change over time.

Simple development instruments within the existing zoning are important and only modify what was strictly necessary to facilitate project implementation and minimize confrontation with other affected interests.

Flexible zoning allows for mixed-use developments (residential, retail offices, recreational, and commercial uses) and creates an active pedestrian area.

Commitment and technical capability by all parties are crucial.

An implementation organization should be properly defined to be capable of the megaproject.

Short-term action plans, along with a long-term vision, need to be developed to ensure success.

Create urgency to act and to create momentum, otherwise, the project risks being perceived as "yet another plan."

Phase the project in order to manage the expectations of the public that want to see change "overnight". It is important not to succumb to the pressure of overpromising results that cannot be achieved.

Overcome intimidating barriers to success, despite challenges that appear overwhelming and discouraging.

Fast implementation, due to proper funding arrangements, empowers project sponsors to execute the project without extensive political interference.

Ongoing implementation of the plan (despite unfavorable/unforeseen circumstances) may reassure developers and investors of their expectations.

Seizing opportunities to identify anchors and catalytic actions, send a strong message that the project is "for real." It is important to demonstrate real commitments to the vision as early as possible and to be opportunistic and aggressive in securing commitments.

4.2.2 Institutional arrangements

Holistic approach to collaboration and renovation by all stakeholders shall be concerned to achieve the goal of repopulating and revitalizing the city.

Addressing social justice measures to overcome extreme poverty: The resettlement of poor urban residents to the periphery may be a source of violence.

Political leadership matters, so the project shall be planned and presented properly to the public and different parties to attract all political parties' consensus.

A flexible approach to negotiating with investors allows for the adjustment to contractual terms, negotiation of extensions, and alterations in land use when market conditions rendered project financial feasibility difficult.

Strong, diverse, and vocal board of directors encompasses diverse technical and professional capacities contributed to the success of the project.

Portraying the project as a civic improvement project rather than a partisan political project with the presence of the opposition party on the board, help the project to be viewed as a party project and do not lose support with changes in political climate.

Maintaining proactive municipal leadership and institutional and political stability are very important when creating major change.

An experienced and capable city resource team with strong civic-minded leadership from the private sector would help and support the development of the city.

A key, flagship project should lead urban regeneration efforts.

Adjust incentives and regulations for private developers to respond to changes in market dynamics, such as attracting private investors and low- and middle-income household buyers.

Continuous community participation and engagement for city regeneration processes shall be done during the design phase and project implementation.

Taking external managerial support along with other technical and professional inputs in the very early stages of the project may help the success of the project. Early stages of the project can be highly challenging because there is little tangible evidence of progress and it is not always feasible to expect an internal managerial team to rally behind a project whose future is uncertain.

Consensus of public officials and other stakeholders may be achieved by an initial draft master plan or urban design framework.

Cultural heritage should be considered an asset and a form of capital that can enhance the identity of a place, generating and even raising property values.

Leading with vision and pragmatism has an important impact on planning and implementation. One important aspect of leadership is having the political will to push through policies or projects that are considered unpopular or politically difficult (if leaders are convinced that such policies or projects have long-term benefits for the city).

Understanding market position, land ownership, and existing conditions of the proposed regeneration area are important in order to assess the scale and scope of the challenge, the barriers that will need to be overcome, and the opportunities that can be created.

Integrated framework and approach in order to recognize the inter-dependencies.

Leverage public and private resources in the most effective manner.

Tenacity and focus, as a primary emphasis of the vision for the city, sent a powerful message that the regeneration project is a foundation for the city.

4.2.3 Public-private cooperation

Create institutional arrangements to support public and private cooperation, such as establishing a PPP (Public-Private Partnership) with real estate developers.

Creating institutional arrangements for absorbing private funds is an important factor in the success of the project. The lack of public financing gave credibility to the corporation with the private sector, and reduce continuous scrutiny and reporting.

Working with markets and a clear, transparent framework for the development in the form of land sale conditions and tender process is an important tool to assure success of the project. The private sector may propose creative forms for providing financial capital.

5. Conclusions

A large number of global population live in metropolises, urban population is increasing all over the world, and the demand for more residential and commercial spaces is increasing yearly. This results in the increase of the economic value and the price of land and real estate in the cities and, respectively, in the downtowns.

The historical centers often were the first choices to be demolished and substituted by modern urban reconstruction. In past, demolition and reconstruction of old heritage buildings in city downtowns was the main source of responding to the growing demand. But every city usually has unused, secluded, or abandoned lands to be used for urban regeneration to provide extra residential and commercial areas to afford the demand increase.

Examples of these new city downtown projects were addressed, which have 200 thousand to more than 2 million square meters of building construction, that are actually megaprojects. These megaprojects cannot be implemented solely by government, public sector, or private sector, but their mutual cooperation is a necessity for the success of these projects. Therefore, in order to save the heritage urban of the cities, the city planners should plan regeneration projects in unused or wastelands of the cities to transform the commercial values and attractions of the heritage urban to the new regenerated project. They shall also be aware of main challenges of this type of regeneration megaprojects, which are mainly institutional and public-private cooperation challenges.

Conflict of interest

The authors declare no conflict of interest.

Author details

Mohammadreza Hajialikhani
Danial Petro Construction Co., Tehran, Iran

*Address all correspondence to: hajialikhani_mr@yahoo.com

IntechOpen

References

[1] Global State of Metropolis 2020. Population Data Booklet [Internet]. 2020. Available from: https://unhabitat.org/global-state-of-metropolis-2020-%E2%80%93-population-data-booklet [Accessed: 2022-11-20]

[2] Huybrechts E. Built Heritage. The Historic Urban Landscape and the Metropolis. 2018;**4**:20-30

[3] UNESCO. Recommendation on the Historic Urban Landscape [Internet]. 2011. Available from: https://www.unesco.org/en/legal-affairs/recommendation-historic-urban-landscape-including-glossary-definitions [Accessed: 2022-11-20]

[4] Elnokaly A, Elseragy A. Sustainable urban regenertion of historic city centres - lessons learnt. European Journal of Sustainable Development. 2013;**2**: 31-54 ISSN: 2239-5938

[5] Rojas E. Sustainable conservation of urban heritage: The contribution of governance-focused studies. In: The Oxford Handbook of Public Heritage Theory and Practice. Oxford: Oxford University Press; 2018. DOI: 10.1093/oxfordhb/9780190676315.001.0001

[6] The World Bank. [Internet]. Available from: https://urban-regeneration.worldbank.org. [Accessed: 2022-11-21]

[7] Development Victoria. [Internet]. Available from: https://www.development.vic.gov.au/projects/docklands?page=overview. [Accessed: 2022-11-23]

[8] Dovey K. Fluid City: Transforming Melbourne's Waterfront. Sydney: University of New South Wales Press; 2005

[9] Greater London Authority. Jan 2008. The Queen's Walk, London: Greater London Authority; Available from: www.london.gov.uk. ISBN: 978-18-47811-09-7

[10] Titanic quarter. [Internet]. Available from: https://titanicquarter.com/ [Accessed: 2022-11-23]

[11] Hetemi E, Jerbrant A, Mere JO. Exploring the emergence of lock-in in large-scale projects: A process view, International Journal of Project Management. 2020;**38**:47-63. DOI: 10.1016/j.ijproman.2019.10.001

[12] Biesenthal C, Clegg S, Mahalingam A, Sankaran S. Applying institutional theories to managing megaprojects. International Journal of Project Management. 2018;**36**:43-54. DOI: 10.1016/j.ijproman.2017.06.006

[13] McAdam D, Boudet HS, Scott WR, Jennifer D, Orr RJ, Levitt RE. Site fights: Explaining opposition to pipeline projects in the developing world. Sociological Forum. 2010;**25**:401-427. DOI: 10.1111/j.1573-7861.2010.01189.x

[14] Hajialikhani M, Azizi M, Sobhiyah MH, Mortazavi M. A review of studies on the impact of institutions on the performance of megaprojects. In: Proceedings of 7th IPMA Research Conference (Trust in Major and Mega Projects); 4-7 Sept 2019. Zagreb, Croatia: International Project Management Association (IPMA); 2020. ISBN (PDF/A): 978-94-92338-29-7

[15] Hajialikhani M, Azizi M, Sobhiyah MH, Mortazavi M. A conceptual model for portraying the impact of institutional elements on performance of construction megaprojects. International Journal of Project Organization and Management. 2022;**14**:176-203

Chapter 3

The Public Urban Spaces Renewal and Architectural Heritage Revitalization: A Lasting Interconnection

Ilda Koca Baltic

Abstract

In the twenty-first century, many cities are undergoing radical urban transformations. This transformation includes the continued development of existing public spaces, but also the architectural heritage revitalization. To preserve and improve the architectural heritage, it is not enough to think only about the structure of the building, but also about the surrounding. Otherwise, the future of urban renewal involves understanding both of urban spaces and architectural context. Reframing the importance of interconnection between historical buildings and urban area improves economical, energy, and social sustainability. This chapter will consider innovative ways of understanding the connection between public spaces renewal and architectural heritage revitalization, in order to represent the creation of modern urban centers and community meeting places. Some of the successful examples that have contributed to the process of urban regeneration will be presented.

Keywords: public spaces, urban renewal, historical buildings, architectural revitalization, green revitalization

1. Introduction

Along with modernization and globalization, new challenges are facing the preservation of architectural heritage. The arrival of new technologies has expanded and increased the speed of distribution cultural elements. Schaefer (2002) sees culture as the "the totality of learned, socially transmitted customs, knowledge, material objects and behavior. It includes the ideas, value, customs and artefacts of a group of people" [1]. Cultural heritage includes also buildings and historic places which are considered worthy of preservation. An architectural heritage can be interpreted as an "artifact," where its elements are witnesses of the cultures, actors, and of events occurred during the life of the building [2]. Many studies have dealt with the importance of revitalization of cultural and architectural heritage. Most of them were related to the revitalization of historic buildings that will contribute to the quality of historical places and urban renewal. The main strategies focus on demolishing old buildings, constructing

new ones, mainly improving the quality of buildings [3], infilling construction in open areas [4], renewing deteriorating urban areas by assimilating new communities [5].

On the other side, the future of urban renewal involves understanding both of urban spaces and architectural context. This is contributed by the fact that "historic urban areas are among the most abundant and diverse manifestations of our common cultural heritage, shaped by generations and constituting a key testimony to humankind's endeavors and aspirations through space and time" [6]. According to Bolici, Gambaro and Giordano [7]: "open spaces in the urban landscapes suffer from deterioration caused by man that leads to two major outcomes: on one side they are abandoned because of newer contemporary needs, on the other hand they tend to be "cannibalized" in the attempt to satisfy our society".

The question is how can revitalization of surrounding environment lead to the creation of a higher-quality public space which contains a sense of place and local identity? What parameters are important in implementing an urban and architectural renewal strategy? The aim of this study is to understand which urban renewal planning strategy for a site produces a better quality and performance of the architectural heritage. The study focuses on the physical-spatial aspect of the open space related to the architectural heritage. The objective is to define a new urban narrative capable of reinterpreting the importance of interconnection between historic buildings and the public urban spaces revitalization.

2. Interconnection between the urban spaces renewal and architectural heritage revitalization- improving the shared space

All through history, the primary function of public space is to connect people and to promote community. Paaver and Küvetm [8] see good public space as a help to strengthen communities, promote citizen participation, reduce segregation, and encourage tolerance**.** According to Reeves, "it is the locations where citizens assemble, express themselves, celebrate victories, exchange ideas, protest, interact with new people, stage festivals, and take part in the informal economy. It is a spot where people know their fundamental rights are protected and where each person is treated as an equal and equally valued by the community" [9]. The UN-Habitat programme dealing with the future of cities and sustainable human settlements defines public spaces as all places accessible and enjoyable by all for free and without a profit motive [10]. Along with the process of urbanization, unmanaged changes in urban areas, which can threaten the integrity and the sense of place, can be observed.

Public spaces in the surroundings of historical buildings have a special role. To preserve and improve the architectural heritage, it is not enough to think only about the structure of the building, but also about the surrounding. According to Mehanna [11], Wang, and Yang [12], historical urban areas are associated with cultural heritage and historical buildings; thus, the renewal of buildings in these areas is prioritized. Such areas retain their original urban structure and unique building characteristics and contain land used for residential economic, and cultural activities. Therefore, the environment of historic buildings should inspire people to make social interactions, but also to share historical values to the community. The value of historical environment should be in connecting the sense of the present with the past. Public places are also of great importance for understanding changes that follow the future. They are not only helping in activating the community, but also in promoting the importance of historical architecture. According to UNESCO [6]:

> *"Public spaces as a historic urban environment, and as a wider context includes notably the site's topography, geomorphology, hydrology and natural features, its built environment, both historic and contemporary, its infrastructures above and below ground, its open spaces and gardens, its land use patterns and spatial organization, perceptions and visual relationships, as well as all other elements of the urban structure. It also includes social and cultural practices and values, economic processes and the intangible dimensions of heritage as related to diversity and identity."*

To enhance the role of public spaces in historic urban landscape we need a systemic approach which consists of new strategies. Some of them are including synergistic approaches that suggest "identifying, conserving and managing historic areas within their broader urban contexts, by considering the interrelationships of their physical forms, their spatial organization and connection, their natural features and settings, and their social, cultural and economic values" [6]. On the other side, Paaver and Küvetm [8] see the maintaining and developing public space as a task for the public sector and requires creativity, professionalism, and cooperation. The major difficulty for authorities is to create and sustain public places that are promoting cultural value of architectural heritage.

Urban renewal notably emphasizes heritage conservation and renaissance [13] rather than simply demolishing and reconstructing deteriorated and obsolete buildings to construct a better living environment [14]. Therefore, these buildings should be restored when required to retain the original architectural appearance. According to the Institute of Historic Building Conservation [15] the combination of refurbished old buildings, exciting new ones, good urban design, and high quality spaces has created places where people positively choose to live, work, and spend leisure time.

Good public space enhances the spatial perception of the historic building not as a stand-alone item but an element in the public space network. On the other hand, revitalized historical buildings contribute to the improvement of the entire zone in which they are located. The architectural heritage can activate unsafe and forgotten public spaces. It is commonly agreed that heritage conservation can bring many social benefits which enhance a sense of identity and local character and bring economic benefits to the community [14]. Therefore, it is important to think about improving historical places in two directions. According to Tur, Delgado, Cortizo [16], the future involves an architecture that acts together the public space that can produce reactions that diminish the environmental impact and promote urban revitalization.

The need to integrate urban and architectural heritage revitalization strategies leads to sustainable development. Lately, the idea of shared space may be advanced to improve the connection with pedestrians in public places space jointly utilized by automobiles along with other vehicles [17]. Urban regeneration processes, when consider architecture, can generate city in the city.

There are many cases of connecting public places and historical buildings. This can be seen in Sechseläuten Square in Zürich, Switzerland and Paris, France- The Louvre Pyramid, where there are unique combinations between old buildings and modern urban renewal (**Figure 1**). In Hong Kong, there have been cases of heritage buildings converted into costly commercial places that generated sizable increases in tourism revenues and created a rise in property prices in the nearby businesses and for land owners in the entire area [18]. In comparison, the three revitalized historic building projects have been completed in different times during the last decade and they have contributed to improvement of the physical conditions of the buildings, ambience of the streets, and the regeneration of the old Wan Chai area [14].

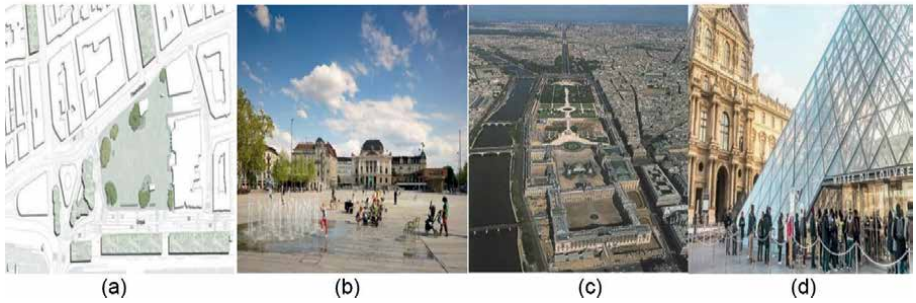


Figure 1.
The view on historic buildings and modern public spaces: Sechseläuten Square in Zürich, Switzerland and Paris, France- the louvre pyramid. a) https://www.publicspace.org/documents/220568/937195/31254 sechselaeuten_page_1pdf.pdf/a5977b2b-bf13-4123-06a4-50aed702c954?version=1.0&t=1525207045852 l, 2. b) https://aquatransform.ch/projects/sechselaeutenplatz-opernhaus-zuerich/, c) https://ar.pinterest.com/pin/536209899370524766/, d) https://www.getyourguide.de/paris-l16/paris-louvre-museum-timed-entrance-ticket-t145779/?visitor-id=CU9AEX9Q9NMB0TE9EUEZBCODNWUMD3R1&locale_autoredirect_optout=true

3. Considerations of a solution- scenes from many applied revitalization practice

3.1 Extensions in new urban-architectural outline

The renovation of historical buildings begins with an analysis of the existing condition. If one part of the building is already demolished, the special consideration is given to the extension of the building. The most often goal is to develop extensions that will be striking and modern in expression. This method can be observed in the intervention at the church of the convent of Sant Francesc, located in the Catalan town of Santpedor, which was converted into a cultural facility (**Figure 2**). This building has been developed with the goal of differentiating the new elements constructed (using contemporary construction systems and languages from the original elements of this historical church). With the aim of preserving all aspects of the building's past, the intervention has not hidden traces, wounds, or scars. Thus, they have remained visible depressions, holes where the altarpieces once were, traces of missing elements [19].

Rather than reconstructing the church, the intervention has just consolidated the old fabric, clearly distinguishing the new elements that are executed of the original ones [19]. The extension ensures the visibility of the entrance, but also emphasizes the small urban space around the building. Urban environment has a simple design. It consists of a bench and a single tree that suggests the loneliness of a culturally enlightened society. Also, its simplicity points us to the importance of an object in which silence and peace prevail.

The dynamic and contrasting connection of the historical building with the modern extension is also observed in the Royal Ontario Museum. This extension was designed by Daniel Libeskind "the best known studio for creating poignant monuments and museums for tragic events" [20] and it was completed in 2007. The impressive structure opens an intensive dialog with the surrounding, rising 37 meters above the ground, and becoming the most important focal point of contemporary architecture in Toronto. The *simple urban* functional furniture surrounds this extension—black benches and a black information panel, which are perfectly combined with the ancient original building (**Figure 3**).

Figure 2.
The church of the convent of Sant Francesc, the Catalan town of Santpedor a) https://commons.wikimedia.org/wiki/File:Obres_al_Convent_de_Sant_Francesc_de_Montblanc_5.JPG, b) https://www.archiscene.net/education/convent-de-sant-francesc-david-closes-architects/https://ca.wikipedia.org/wiki/Convent_de_Sant_Francesc_%28Santpedor%29, c) https://www.archdaily.com/251389/convent-de-sant-francesc

Figure 3.
The modern extension of the Royal Ontario Museum, Toronto. a) https://tayloronhistory.com/2015/05/31/history-of-the-royal-ontario-museum-rom/ chin-crystal-15,427,415.html, b) https://www.thestar.com/entertainment/visualarts/2017/06/26/toronto-still-cant-decide-if-it-likes-the-rom-crystal.html

Another project of Libeskind also connects the rigidity of modern expression with classical architectural values—the extension at the Contemporary Jewish Museum in San Francisco, completed in 2008. According to Allen [21], a geometric form clad in blue steel juts out of a brick building that used to be a power plant. The steel portion, which contains exhibition, performance, and event spaces, is designed to mimic the Hebrew letters *chet* and *yud*, spelling *l'chaim* or "to life" [21]. In the same way as in the project of the Royal Ontario Museum in Toronto, plain urban furniture, consisting of concrete benches and two street lamps welcome visitors and accentuate the entrance. With the synergy of urban planning and architecture, not only the urban space was revitalized, but also the historical building of the museum. The water surface, which reflects the facade of the historical part of the building, emphasizes its rhythm and the harmony of the openings (**Figure 4**).

3.2 Glazed urban spaces as a part of historical building

In order to eliminate some of weather issues, many public courtyards have horizontal glazing above. Courtyards become atriums, some of which still retain the esthetics of the urban garden. The use of glass, as a material for urban space, eliminates a visual barrier and allows an abundance of natural light to flood down into the building. This can be observed in the Isabella Stewart Gardner Museum, a Venetian-style palazzo, renovated by Pritzker Prize-winning architect Renzo Piano and the Renzo Piano Building Workshop (Genoa, Italy) in 2004 (**Figure 5**). This project of revitalization adds "70,000 square feet consisting of two new buildings. The first building attaches to the original

Figure 4.
The modern extension in contemporary museum in San Francisco. a) Unknown. b) https://www.architecturaldigest.com/gallery/daniel-libeskind-architecture, c) https://libeskind.com/work/contemporary-jewish-museum/

museum and takes on the appearance of 4-stories in glass and copper. The second building is smaller in size and uses the area for greenhouses and living quarters" [22].

Not just a new wing, houses gallery space for special exhibitions and other facilities [23] are added, but also the glass skylight, which illuminates the central atrium of the original building. This atrium is seen as an exquisite interior courtyard, and can be described both as an urban public place and as a part of a historical building. According to Artnet, "the Gardner's interior courtyard combines ever-changing horticultural displays with sculpture and architectural elements [24]. The interplay between the courtyard and the museum galleries offers visitors a fresh view from almost every room, inviting connections between art and landscape" [24]. The following testimony of a visitor describes this impressive indoor public space:

> *"Although we arrived in the afternoon, we were able to enjoy strolling the courtyard with its exotic and lush tropical plants encased in the four-story, glass-roofed, all-season conservatory. Dusk arrives early in winter in Boston, so the lighting was dim(...)The Isabella Stewart Gardner Museum has something to impress everyone, from museum antiquities to interior lush landscaping [25]."*

Beside the glass ceiling, glass walls are also frequently used. Improvements in glass processing technology have made it possible to render an effective solution for historical buildings and their esthetics. Glass walls are most commonly constructed with the full height glass panels, in order to bring a real dramatic visual feature to the core purpose of the historical place. This can be observed in a winning entry in a competition of renovating

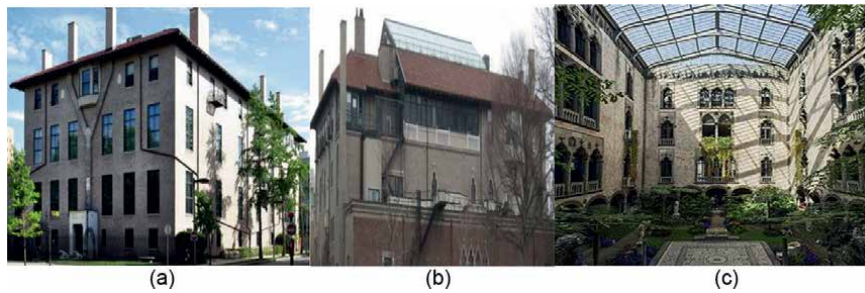


Figure 5.
Isabella Stewart Gardner Museum and the glazed atrium, Boston. a) https://www.asla.org/guide/site.aspx?id=39982, b,c) https://en.wikipedia.org/wiki/Isabella_Stewart_Gardner_Museum

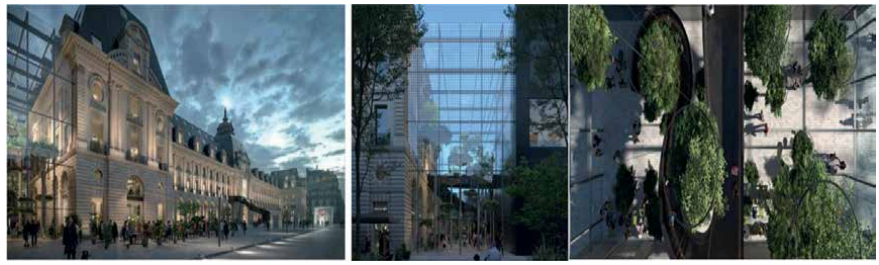


Figure 6.
Palais du commerce and the glazed atrium, Rennes. https://www.designboom.com/architecture/mvrdv-palais-du-commerce-extension-rennes-02-12-19/

and extending the historic "*palais du commerce in Rennes,*" (**Figure 6**) where glass walls are forming the atrium and the connection between new and old building. This design is considered as a tool for revitalization both the building and the surroundings. According to Barandy, "MVRDV's proposal will reactivate the place *de la république* and turn this former public building into a centerpiece of the city's main commercial street, raising it to the level of significance that was initially intended [26]. De vries, founding partner of MVRDV, elaborates: "*not only is palais du commerce a local landmark, but its transformation will turn the place de la république into a popular destination and act as a vital catalyst for its surroundings* [27]." Inside the glass cube is a closed public space enriched with greenery. Also the impressive, almost sculptural stair is added, in order to fulfill the functionality through a upper level. Construction of the project will begin in 2022, with completion expected for 2025.

In some cases, the urban area around historical buildings is glazed with spherical glass walls. Such an example can be seen in 120 meters long and 25 meters high Strasbourg Railway Station glass shell (**Figure 7**). This shell represents 6500 m^2 façade area which encloses the historic station building and serves as "the entrance building and as the link between train tracks and trains, trams, buses, taxis as well as the underground" [28]. The glass bubble along the south side of the station is an answer on thermal energy and it functions as a double "skin" of the building. "By carefully designing the building to help pull in more air than would come out naturally from the tunnel (and by adding a couple of simple, low-energy devices like a radiant slab, itself drawing from the water table), it is possible to make the space under this very large south facing glass wall comfortable in summer, almost exclusively through passive means" [29]. Now, the public space which surrounds the station becomes one of

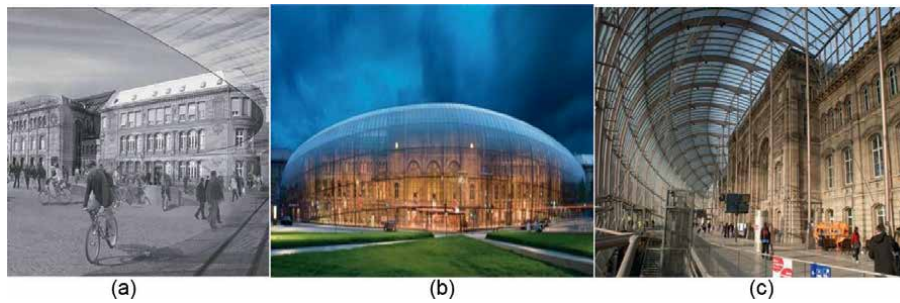


Figure 7.
Strasbourg Railway Station glass shell. a) https://www.northernarchitecture.us/performative-architecture/strasbourg-train-station-extension.html b) https://seele.com/references/strasbourg-railway-station c) Hugh Llewelyn-https://www.flickr.com/photos/58433307@N08/5698669435/

the urban features of the city. Therefore, the project of revitalization seeks to promote the historical presence of a train station. Also, it tends to link "the various points of access to the various modes of transportation and to provide proper shelter in all possible climates" [29].

3.3 Revitalization through sustainable reuse - activating urban alleys

Thinking about a broader vision for revitalization and highlighting historic resources, many architects use the opportunity to activate the surrounding alleys. According to the Alley Dwelling Act [30], an alley is "any court, thoroughfare, or passage, private or public, thirty feet or more in width, that does not open directly with a width of at least thirty feet upon a public street that is at least forty feet wide from building line to building line." As alleys have always been perceived as unsafe places, those hidden passageways are often avoided by passengers.

In historical areas, alleys should be recognized as an important point of revitalization of historical buildings. *Especially* when *taking into account that alleys can make* a compatible relationship, but also an appropriate separation between new development and historical buildings. A physical interaction with architectural heritage gives them a placemaking potential. "Most under-used spaces and buildings have both physical and intangible cultural and natural heritage with a high recreational, aesthetic, therapeutic, social, and cultural interaction value" [31]. In some cities, where a lot of downtown areas exist, activating alleys includes accommodating existing functions that are integral to the operations of downtown organization.

As highlight historical assets, alleys are also providing safety and opportunities for people to relax and visit old historical buildings. They are also "providing affordable opportunities for new small businesses and expansion of existing local businesses (e.g., Sydney, Australia small business program for alleys), supporting green corridors (Austin, xxiv Chicago), celebrating visual and performing arts, expanding the pedestrian network and connectivity to other parts of downtown, and enhancing pedestrian experiences through car free, intimately-scaled spaces" [32].

There have not been many studies that represent the importance of alleys in historical areas. However, there are some alleys, for example, Blagden Alley and Naylor Court that are officially recognized for their impact on historical buildings. Similarly, Cady's alley (**Figure 8**) "has been recently renovated, and its formerly under-utilized collection of 19th century stables, warehouses and alley dwellings have been converted into an exclusive shopping district filled with high-end designer show rooms, office spaces, and a restaurant" [32]. In Boston, there is an alley converted into a bookstore, and in Seattle, there is an "open-gallery" alley (**Figure 8**).

In all of these cases, defining strategies for overcoming challenges in revitalization of alleys, their existing conditions along with cultural and historical significance should be precisely verified. According to The City of Austin Downtown Commission, Alley Activation Workgroup (2013) "re-examining the functional vs. cultural landscape of alleys and developing a plan to re-invent one or more of the city's alleyways as a neighborhood amenity on a temporary or permanent basis should also be observed". Activation of alleys can be done through a redesign and improvement of physical place, and also through human activities and social events. This can be observed in the Austin downtown area, where several alleys are recognized as important (**Figure 9**). They are activated with a "variety of art which is designed by Dan Cheetham and Michelle Tarsney as "a temporary aerial sculpture with brightly colored, interwoven twine that was hung across the alleyway, together with

Figure 8.
Cady's Alley, Georgetown, Washington, bookstore in the alley; Boston, MA, "20' WIDE," collaborative case study in creating temporary activations for downtown alleys. Michael Knox, City of Austin, Economic Development Departmen https://de.foursquare.com/v/cadys-alley/4b6c764bf964a520143c2ce3/photos

a collection of paper origami peace cranes created by children at the Art" [32]. In this way, the appearance of historical building, recognizable by its old bricks, is preserved.

3.4 Green revitalization

Historical preservation and renewal plans should have a long-term perspective. Therefore, projects focused on finding new design approaches for heritage revitalization are also developing *green* growth *strategies. According to* Elshater [33] "since the mid-eighties of the last century, the international community began to realize the need for a combination of political and scientific efforts to solve environmental problems." At the center of this issue is ecological design strategy, which helps architect toward generating revitalization concepts based on sustainable green thought. Hunts [34], sees using "the right materials and appropriate techniques" as a method by which "our building heritage can be made sustainable".

The value of green areas is demonstrated through their multiple benefits. When applicable to the architectural revitalization and renovation of the building, the green projects can greatly reduce the embodied carbon in the buildings, creating a sustainable model of development for the future. It is well-known that adding green roofs to historical buildings can enhance their energy performance. However, "full greening" refers to full-surface coverage of a facade with climbing plants. While some plants can

Figure 9.
The Austin downtown area produced by Michael Knox, City of Austin, economic development department, City of Austin. https://www.austintexas.gov/sites/default/files/files/EGRSO/Activating_Austins_Downtown_Alleys_as_Public_Spaces.pdf

Figure 10.
Full-surface facade greening with wisteria on climbing supports, town hall Riesa / Saxony, ancient ivy in the nature park on the Ilm river in the Templar hall, Weimar/Thürigen [36]. https://www.fassadengruen.de/en/classicism-and-building-greening.html

cover an entire facade without the need of a climbing support/trellis, it is also possible to attach grids and trellises to the wall, and to combine several climbing plants to create contrast, what we call "mixed greening." (Fassadengruen.de).

As the intersection between architecture and public space, green areas can improve the walking and cycling experience. Also, it is "hoped that green open space from any urban area development planning, carried out by the respective regional governments, which in turn can have an impact on both the wider community and the surrounding environment, both as a fulfillment of the need for public space as a means of the activity or as a container or means of pollution reduction air" [35].

In addition to heritage revitalization laws and principles, a condition of the structure, load bearing capacity, planning permits, safety, and the climate must be considered. This can be observed in Saxony, where old buildings have been restored with full or part-surface facade greening. Also, an ancient ivy in the nature park on the Ilm river in the Templar hall in Weimar has been green-redesigned in the style of Romanticism. In this way, not only architectural heritage was revitalized, but also the urban environment (**Figure 10**).

4. Conclusion

Historic revitalization is complex and it is constantly evolving. In recent years, with technological innovation, understanding of the importance of the relationship between urban renewal and the restoration of architectural heritage is being recognized. Generally, this interconnection is represented as a way of promoting the sustainable development of cities. It includes improvement of historical buildings and development of land resource utilization. Therefore, a holistic approach to the revitalization of historic urban areas began to be applied.

Urban renewal strategy that includes architectural revitalization leads to the creation of a higher-quality environment. Urban places with this value can increase social interactions. Many scientific studies show the benefit of having stronger, more active communities. However, there are not many studies that give guidelines on how to redesign the historical environment to achieve this. Hereof, some of the strategies in building a lasting interconnection between public urban places and architectural heritage are represented in this chapter.

One of the ways to activate a historical place is by renovating the building itself. The special consideration is given to the extension of the building. In order to emphasize the difference between the old and the new part of the building, the most often goal is to develop modern extensions. Many of those urban environment has a simple design, given that simplicity points us to the importance of historical object.

Another way of revitalizing historical areas includes using the right materials. The use of glass, as the most common, eliminates some of weather issues, as well as a visual barrier between the building and environment. It also allows the building to be illuminated by natural light. In those projects of revitalization, the light and shade play an important role, as they become an essential component that gives an architecture a sense of identity. In some cases, with the use of glass, courtyards become atriums. Whether they are formed as a cube or the urban area around historic buildings is glazed with spherical glass walls, many of those atriums can be described both as an urban public place and as a part of a historical building. They are often enriched with greenery. In that manner, atriums get a great quality of an outdoor space.

Thinking about a broader vision for revitalization, many architects activate the surrounding alleys. In that manner, a city's alley should be space dedicated to a singular use—movement. And their primary goal should be the safe and efficient use by pedestrians**.** A spatial-physical interaction with architectural heritage gives alleys a placemaking potential. They provide many opportunities for people to gather and relax. Alleys can be revitalized as green corridors, with a good paving, or as an open gallery that celebrate visual and performing arts. Furthermore, they can expand the pedestrian network and enhance pedestrian experiences and safety in visiting historical buildings.

Historical renewal plans should also have a long-term approach. Therefore, heritage revitalization includes "*green" strategies. It is well-known that* the green projects can greatly reduce the embodied carbon and enhance energy performance of historical buildings. Furthermore, green areas can improve the walking and cycling experience. They can have an impact on the community and the environment, as a public space, and as an area that reduce pollution in air.

Architecture and public space, when cooperate, can multiply urban and architectural vitality effects. Reinterpreting the importance of interconnection between historical buildings and urban area improves economical, energy, and, the most important, social sustainability. It can be used as a social connector, where people can come together for both unique public events and visiting old buildings. Interconnection between public space and public buildings can increase performance and quality of urban areas, as well as senses of neighborliness and belongingness. Finally, making connection between the inner and outer spaces, buildings, and environment can lead into generating city in the city. This process will be increasingly common in an urbanized world, especially in some territories with a long urban history. The desired macro and micro goals may be produced: the improvement of the global social interconnection; cities, where the history and future are combined, and historical buildings as places of heritage, synergies and interconnections.

Author details

Ilda Koca Baltic
Independent Researcher, Niš, Serbia

*Address all correspondence to: ildakoca@gmail.com

IntechOpen

References

[1] Nwegbu MU, Eze CC, Asogwa BE. Globalization of Cultural Heritage: Issues, Impacts, and Inevitable Challenges for Nigeria. 2011. Available from: https://digitalcommons.unl.edu/libphilprac/674/

[2] UNESCO. World Heritage Convention. 1972. Available from: https://www.igi-global.com/dictionary/architectural-heritage/48665

[3] Carmon N. Housing policy in Israel: Review, evaluation, and lessons. Isr. Aff. 2001;**7**:181-208

[4] Newton P, Glackin S. Understanding infill: Towards new policy and practice for urban regeneration in the established suburbs of Australia's cities. Urban Policy Research. 2014;**32**:121-143

[5] Kleinhans R. Social implications of housing diversification in urban renewal: A review of recent literature. Journal of Housing Built Environment. 2004;**19**:367-390

[6] UNESCO. Recommendation on the Historic Urban Landscape, including a glossary of definitions; Paris, France. 2011. Available from: https://www.unesco.org/en/legal-affairs/recommendation-historic-urban-landscape-including-glossary-definitions

[7] Gambaro M, Bolici R, Giordano C. The regaining of public spaces to enhance the historic urban landscape, Vol. 2 No. 1. 2017. Available from: https://www.crimejusticejournal.com/article/view/240/0

[8] Paaver T, Küvet E. Public space as an interconnecting network within the living environment, Estonian Human Report Development. 2019. Available from: https://inimareng.ee/en/public-space-as-an-interconnecting-network-within-the-living-environment.html

[9] Reeves B. Activating the alleys of austin, Master of city and regional planning. Georgia Institute of Technology. 2016;**2016**:10-11

[10] United Nations. New Urban Agenda. United Nations Conference on Housing and Sustainable Urban Development (Habitat III). 2017

[11] Mehanna WAE-H, Mehanna WAE-H. Urban renewal for traditional commercial streets at the historical centers of cities. Alexandria Engineering Journal. 2019;**58**:1127-1143

[12] Wang M, Yang J, Hsu W-L, Zhang C, Liu H-L. Service facilities in heritage tourism: Identification and planning based on space syntax. Information. 2021a;**12**:504

[13] Steel R, Slayton WL. Urban Renewal/a Retrospect of Addresses and Discussions at the Chartered Surveyors Annual Conference. In: Supplementary Information on Urban Renewal Procedures in the United States of America. London, UK: Royal Institution of Chartered Surveyors; 1965

[14] Jayantha WM, Yung EH. Effect of Revitalisation of Historic Buildings on Retail Shop Values in Urban Renewal: An Empirical Analysis2018. DOI: 10.3390/SU10051418. Available from: https://www.semanticscholar.org/paper/Effect-of-Revitalisation-of-Historic-Buildings-on-Jayantha-Yung/b3a053a05d224ab432dbd228289718b7d245f94f

[15] Institute of Historic Building Conservation. Conservation of the

historic environment.2021. Available from: https://www.designingbuildings.co.uk/wiki/Conservation_of_the_historic_environment

[16] Tur J, Delgado A, Cortizo D. Architecture renewal in relationship to public space as a catalyst for urban regeneration, HUCAMP Arquitectos, Paseo de los Sauces 21. Spain: Boadilla del Monte; 2018. Available from: Available from: http://www.walk-al.com

[17] Kuzilenkova N. Social urban project. From the ghetto to a healthy neighborhood in 6 steps. 2016. Available from: https://www.researchgate.net/publication/338107933_Public_spaces_in_historic_sites_as_a_Tool_of_raising_cultural_awareness

[18] Siu SW. Cashing in on the '1881 Effect'. The Standard. 2009

[19] Closes D. The Saint Francis Convent Church by David Closes in Santpedor. Spain; 2011

[20] Crook L. 2022. Available from: https://www.dezeen.com/2022/11/23/studio-libeskind-boerentoren-tower-renovation-antwerp/

[21] Allen E. 14 Forward Thinking Buildings by Daniel Libeskind. 2016. Available from: https://www.architecturaldigest.com/gallery/daniel-libeskind-architecture

[22] Edgers G. Gardner's $118m expansion plan set. The Boston Globe. 2010. Available from: https://en.wikipedia.org/wiki/Isabella_Stewart_Gardner_Museum#cite_note-:0-15. https://www.timeout.com/boston/museums/isabella-stewart-gardner-museum [Retrieved March 26, 2010]

[23] Time Out Boston Staff. 2020. Available from: https://www.timeout.com/boston/museums/isabella-stewart-gardner-museum

[24] Artnet. A New Museum Network Is Focusing On the Monuments Men's Long-Overlooked Postwar Cultural Contributions. *Artnet News.* 2021-06-17. 2020 [Retrieved July 14, 2021]

[25] Fine Gardening editors, GPOD on the Road: The Isabella Stewart Gardner Museum, A unique museum with a garden at its center. 2022. Available from: https://www.finegardening.com/article/gpod-on-the-road-the-isabella-stewart-gardner-museum

[26] Barandy K. MVRDV introduces public green space to historic palais du commerce in rennes. 2019. Available from: https://www.designboom.com/architecture/mvrdv-palais-du-commerce-extension-rennes-02-12-19/

[27] de Vries N. MVRDV to Transform Historic Palais du Commerce in Rennes. 2019. Available from: https://www.archdaily.com/911321/mvrdv-to-transform-historic-palais-du-commerce-in-rennes

[28] Seele. Glass shell of strasbourg railway station. 2022. Available from: https://seele.com/references/strasbourg-railway-station

[29] Performative Architecture. Strasbourg Train Station Extension. 2022. Available from: https://www.northernarchitecture.us/performative-architecture/strasbourg-train-station-extension.html

[30] Alley Dwelling Act (48 Stat. 930). Alley Dwelling Authority. Washington, DC: Alley Dwelling Act; 1934

[31] Ricci L. The Green City Dimension Reconquering public spaces by interlinking design, inclusion, and

sustainability" Directorate–General for Regional and Urban Polic, B-1049 Brussels. 2021

[32] The City of Austin Downtown Commission- Alley Activation Workgroup. Activating Austin's Downtown Alleys as Public Spaces. 2013. Available from: https://www.austintexas.gov/sites/default/files/files/EGRSO/Activating_Austins_Downtown_Alleys_as_Public_Spaces.pdf

[33] Elshater A. Urban design redux: redefining a professional practice of specialization. Ain Shams Engineering Journal. 2015;**6**:25-39

[34] Hunts R. Old House Eco Handbook: A Practical Guide to Retrofitting for Energy-Efficiency & Sustainability Hardcover. 2013. Available from: https://www.amazon.co.uk/Old-House-Handbook-Energy-Efficiency-Sustainability/dp/0711232784/ref=sr_1_1?s=books&ie=UTF8&qid=1427633951&sr=1-1&keywords=old+house+eco+handbook

[35] Rezky Noor Handy M. Revitalization of Green Open Space to Fulfill the Needs of Urban Communities. In: 2nd International Conference on Social Sciences Education (IC). 2021. p. 224

[36] Full Wall Greening. 2022. Available from: https://www.fassadengruen.de/en/full-greening.html

Chapter 4

The Role of Museums and Communities in Sustainable Heritage Site Management in Bangladesh: The Case Study of Mahasthangarh

Mohammad Mahmudul Hasan Khan and Mohammad Niamul Huda

Abstract

Mahasthangarh in Bogura district, Bangladesh, is a historic fortified city of fourth-century BCE, considered an important reference site for the ancient metropolis of South Asia. The Department of Archaeology (DoA) of the Government of Bangladesh is the only authority responsible for managing cultural heritage. However, sites are facing several threats and challenges and unfortunately, there is no effective management plan developed. Mahasthangarh as a case study, this research aims to demonstrate the roles and potentialities of site museums and local communities in forming sustainable heritage management by using qualitative and quantitative methods and SPSS software. In this study, 250 individual respondents were interviewed from various sectors with formatted questionnaires.

Keywords: archeological site museum, local community, threats and challenges, sustainable heritage management, Mahasthangarh, Bangladesh

1. Introduction

Site museums and local communities play a vital role in achieving sustainable heritage management. It is true that museums are now vigorously working with both tangible and intangible heritage since their collaboration with communities and societies [1]. Recognition of the role of community engagement could make countless contributions to enhancing sustainable heritage safeguarding. The involvement of the community in archeological research and heritage safeguarding has been awareness to heritage managers [2].

Bangladesh is a tropical monsoon climate country of South Asia, and the majority of the heritage sites are located in rural area, where land is being used extensively by the poor local agrarian society. There are about 23 site museums, where the

Department of Archaeology (DoA) of the Government of Bangladesh is the only authority and is responsible for preserving, protecting, interpreting, and managing the cultural heritage. After the first inclusion back in 1999, recently DoA updated the UNESCO World Heritage Tentative List, where Mahasthangarh was inscribed under the title "Cultural Landscape of Mahasthan and Karatoya River" and included the criteria (i) and (vi) with the previous two criteria (ii) and (iii) [3]. It is a potential heritage site and one of the prominent ancient fortified cities of South Asia that helps to understand the cultural development of ancient civilizations of the Bengal Delta through the successive period. During the invasion of Alexander the Great in 325 BCE, the deltaic Bengal was identified as *Gangaridai* (the people of the Ganges region) to the Greek and Roman world by their own writers who referred to it as a mighty nation of the Indian subcontinent [4].

Like many other heritage sites of the country, Mahasthangarh faces various threats and challenges damaging and declining its outstanding universal value. This research is intended to demonstrate the role and potential of the site museum and community in sustainable safeguarding and managing the tangible and intangible heritage of Mahasthangarh as a case study. The present research has been carried out using qualitative methods, such as personal interviews, group discussions, fieldwork, observation, and assessment of related resources. Data have been gathered from both primary and secondary sources. We hope this research will foster critical discussion, develop and enhance the capacity of the Department of Archaeology (DoA), inspire further research, and advance sustainable heritage management at the national and international level. Mahasthangarh is one of the most potential heritage sites in Bangladesh to be inscribed on the UNESCO World Heritage List.

2. Mahasthangarh

Mahasthangarh (24°57′09′′N, 89°20′53′′E) is located in the Bogura district on the bank of the Karatoya River in the northwestern part of Bangladesh. The present name Mahasthangarh literally means "*Maha* means Great, *sthan* means Place, *garh* means fort" or *Mahasnan means* "a Great Bathing Place," which first mentions in a Sanskrit text entitled "*Vallalcharita*" and *"Karatoya Mahatmayam*" of circa thirteenth century CE [5, 6]. Mahasthan was known in the pre-Muslim period as Pundranagara/Pundravardhana-Bhukti and in the Muslim period (thirteenth century), the name changed to Mahasthan/Mahasthangarh [7].

The heritage of Mahasthangarh consists of two distinct features: the fortified citadel and its vast suburbs/hinterlands. The present study area is a fortified citadel that occupies about 400 acres (163 hectares). DoA has acquired only 42 acres (13 hectares) and continues to acquire land from the local communities. The citadel is nearly oblong, surrounded by brick-built massive defensive rampart that is general elevation about 15 feet above the plain ground. The citadel is about 1.5 km (5000 feet) in length from north to south and 1.4 km (4000 feet) in breadth from west to east. It was highly protected on the east by the well-known Karatoya River and on the other three sides by the deep moat with marshland (**Figures 1** and **2**), which are still partially visible (see details-6). Recently, the eastern rampart and a portion of the northern rampart have been conservated by the South Asian Tourism Infrastructure Development Project (SATIDP) (**Figures 2** and **3**).

In the citadel, approximately 5000 people (3400 voters) are living among the 1050 families, all are of Muslims. Most of the people are farmers about 80%, vehicle drivers about 10%, and the rest do different jobs and business-related work. Archeological

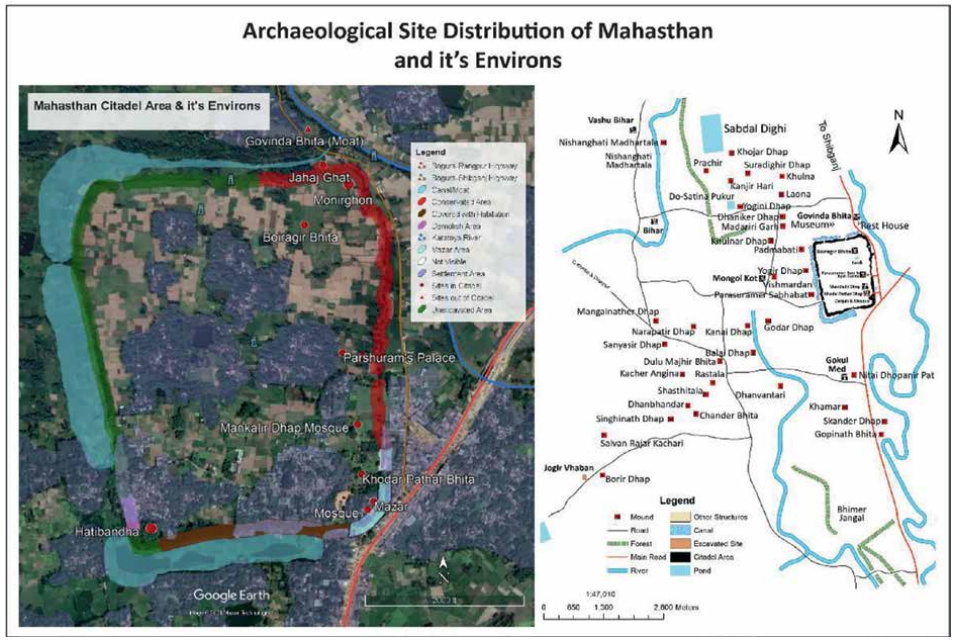


Figure 1.
Map shows the Mahasthangarh citadel (after modifying the Google Earth image) and site settings of its hinterlands.

findings suggest that most of the area has been occupied since the beginning of the historical period (c. fourth century BCE) to the colonial period (eighteenth century CE). The Franco-Bangla joint venture team (from 1992 and onward) has unearthed 18 cultural sequence levels ranging from the last quarter of the fourth century BCE to eighteenth century CE in their proper stratigraphic contexts [8]. However, at present, the citadel is under cultivation and modern settlements. The Mahasthangarh is a key site for studies of the Bengal deltaic civilization, owing to its extensive archeological and literature evidence [see details in [7, 8]]. It bears unique and exceptional testimony to its city layout, charming landscape, and about 8 km radius hinterlands (**Figures 1** and **2**). The site has huge tourism potential; unfortunately, there is no sustainable and effective tourism plan and policy.

3. Threats and challenges

The present study discovers some key threats and challenges to implement a sustainable heritage management plan for Mahasthangarh. For ease of discussion, those are grouped as follows.

3.1 Socioeconomic issues

3.1.1 Over grown population

Mahasthangarh is located in a rural setting with a high demand for cultivable land as well as residential purposes. As a result, heritage sites are prone to enclosure and destruction by the local inhabitant. Since historical times, this place is a popular

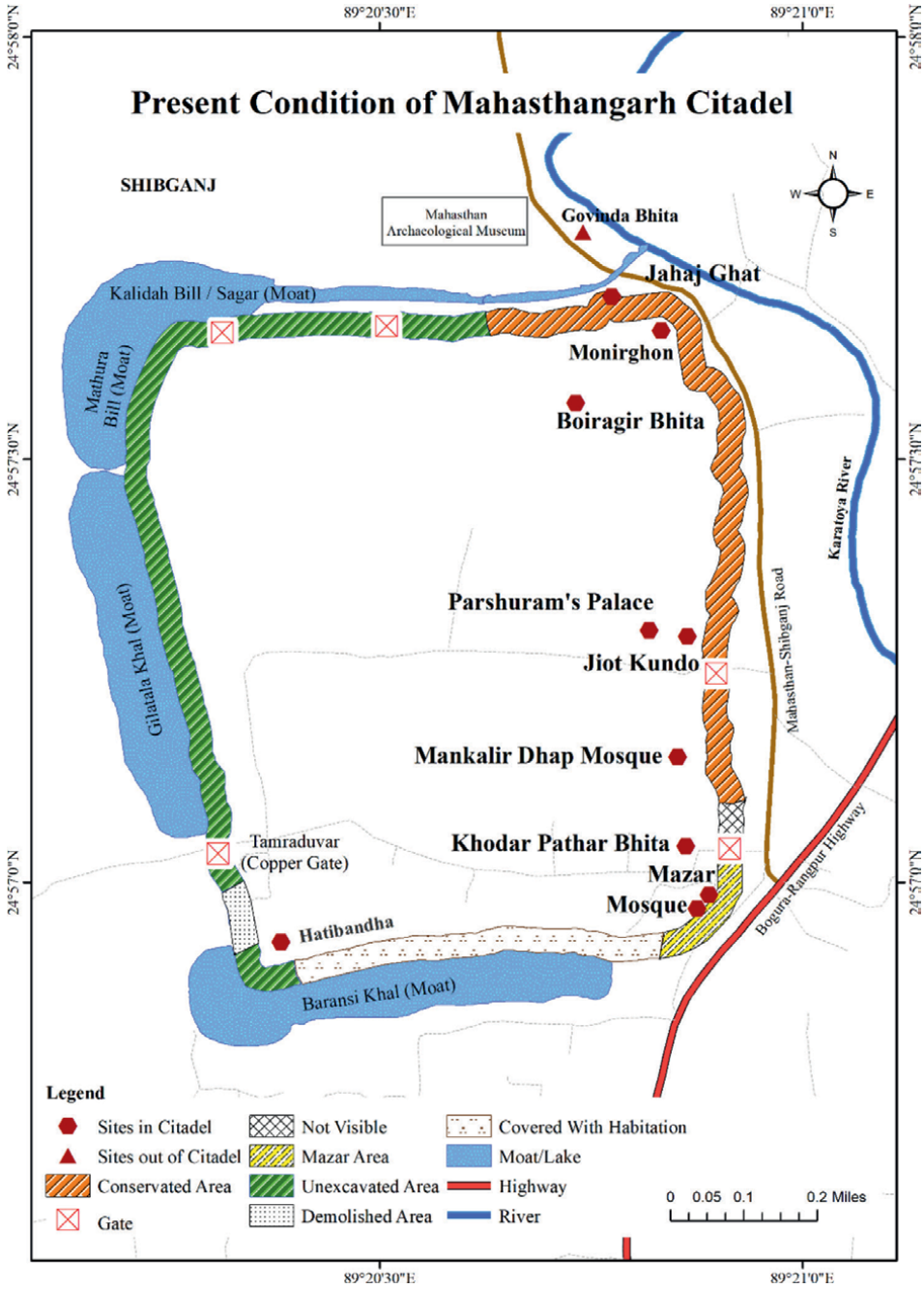


Figure 2.
Ground plan of Mahasthangarh rampart and site setting shows the present condition of citadel through the different types of legend.

marketplace for the surrounding hinterland, and its prosperity growing at a rapid pace, which in turn creates a steady and high demand for land for commercial and other purposes of migrated people. At present, the south rampart is entirely covered with a present settlement. In the southwestern corner of Mahasthangarh citadel

Figure 3.
Renovated rampart (northeastern) of Mahasthangarh citadel.

beside the *Tamraduvar* (copper gate), a new settlement and infrastructure demolished the potential rampart.

3.1.2 Illiteracy and ignorance

The present education system at various levels is inadequate to incorporate the students, the common people, and local inhabitants into the heritage safeguard and maintenance issues. The present research noted most of the local inhabitants and visitors, even teachers and students of school-college, do not know the site's informative knowledge as well as the importance of site management (**Figure 4**). Moreover, a deficiency of well-coordinated heritage awareness programs and training should be planned and executed to overcome the deficit and could ensure sustainable heritage management among the stakeholders.

3.1.3 Poverty-related crime

Bangladesh as a whole still fights poverty and all its negative outcomes of it in society. It is challenging most of the time to enforce law and order in remote areas. Mahasthangarh is no exception and many times, starting from petty crimes to smuggling heritage items is also noticed. Primarily, the shortage of manpower in law enforcement agencies and DoA is a concern but to solve the issue and maintain the safeguard of the heritage site and artifacts, a community-wide patrolling and monitoring program could be a viable solution.

3.1.4 Encroachment and looting of ancient bricks

In Mahasthangarh, numerous architectural sites are buried and hidden under the surface and most of them are not yet identified and mapped by the DoA. As a result, the local inhabitant and brick hunters frequently commit illogical and unauthorized digs for ancient bricks and sell them. As a consequence, many potential heritage sites are destroyed and damaged beyond repair and sometimes lost forever, even before being noticed by the scholarly world. The Mazar area is encroached on by the

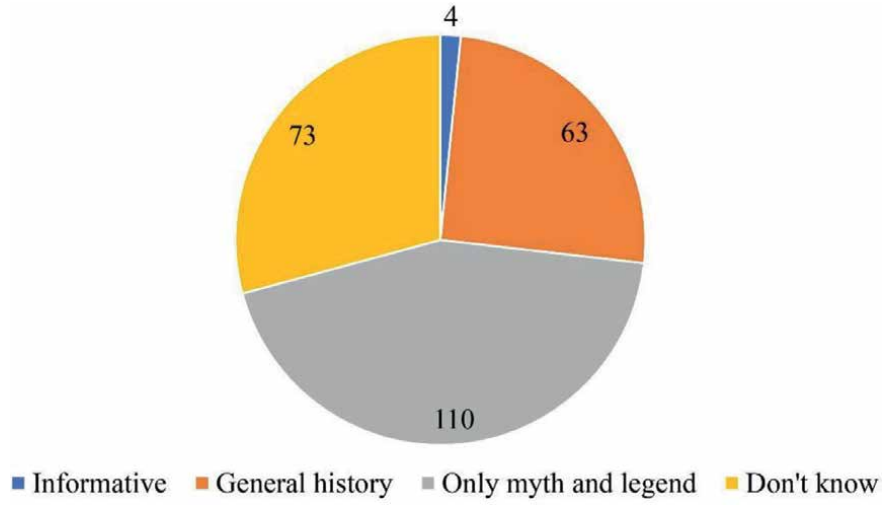


Figure 4.
The pie chart shows the result of the question "what do you about Mahasthangarh heritage sites?"

local people for market and tourist vehicle parking. On the other hand, the south rampart is covered due to encroachment and the southwestern corner of the citadel is encroached by local inhabitants for habitation. Many cultural properties are being gradually squeezed due to encroachment (**Figure 5**).

3.2 Heritage site acquisition and related management issues

3.2.1 Site ownership and control

Total Mahasthangarh fort city is a large area covering (1.5×1.4 km approx..) and most of the land is privately owned by local community and DoA acquired only a fraction (about 13 hectares) of citadel area, which has been explored and excavated by the DoA. In this instance, *The Antiquities Act, 1968 (amended in 1976)* should be mentioned, which hindered streamlining the acquisition processes of heritage sites and maintenance. This Antiquities act need to be revised regular basis.

3.2.2 Improper land use

As stated earlier, only a fraction of land is acquired and protected by DoA presently, there present a misunderstanding and disorganized land use, which resulted in the destruction and demolition of heritage in many occurrences. A short- and long-term land use plan should be prepared with ensuring the presence of all stakeholders could safeguard the heritage site in concern. It observes that, in many instances, DoA leased the acquired land adjacent to the heritage site inside the citadel for generating revenue, where farmers dig deep tube well, drainage, and use tractor regular basis for their farming purpose, which in turn damages the heritage landscapes.

3.2.3 Insufficient management

The insufficient capacity for a proper heritage management infrastructure of DoA resulted in poor and inadequate heritage management for the heritage site

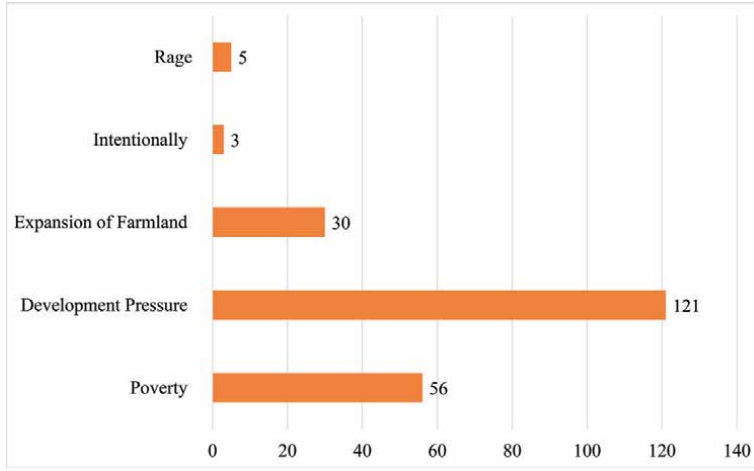


Figure 5.
The bar chart shows the results of the question "what is your opinion regarding the reason behind damage of the heritage site by local communities?"

Mahasthangarh. The Global Heritage Fund has identified Mahasthangarh site as one of 12 global sites most "On the Verge" of irreparable loss and demolition, quoting insufficient management and looting as primary reasons [9]. The daily round-like excavation, conservation, preservation, and proper monitoring is insufficient and cannot be done regularly. Based on site requirement, there is lack of an insufficient number of management workmen and a deficiency of skillful and experienced manpower, particularly in the area of conservation and preservation management. Insufficient management policy reduces integrity, authenticity, and future potentiality as a tourism area.

3.2.4 Relationship among stakeholders

Every project has stakeholders who can influence or be influenced by the project in a positive or negative manner [10]. To ensure a sustainable heritage management plan, all stakeholders must be in sync and aim to achieve a common goal. Proper coordination between all the concerned stakeholders who are playing key roles is not well coordinated presently. Participation of all of them only could ensure the success of achieving the common goal. As a developing country, necessary finance and infrastructure could only be maintained by all the stakeholders combined.

3.3 Heritage awareness program and training issue

Due to various bureaucratic complicacy and flaws inherited in the administrative structure, the policymaking person or the body is not properly trained and skilled in the necessary steps that are necessary for sustainable heritage management. Besides, the execution of a feasible and viable short- and long-term sustainable master plan depends on so many other variables also that need to be considered. The insufficient training and various skills-enhancing programs could not ensure the proper use of the existing human resources. On the other hand, a multitiered heritage awareness program is not planned for various leveled education institutes and local inhabitants.

3.4 Conservation and preservation issues

Insufficient archeological and historic testimony causes improper restoration of the different potential ruins. Apart from this, deficiency of appropriate research, insufficient of efficient conservators, and untrained workmen cause improper restoration, which can reduce the integrity and authenticity of the structure. Mankali Kundu Mosque, Porshuram's palace, and Rampart are the examples of improper restoration, where the modern brick used for restoration and conservation is not in a good condition.

3.5 Environmental issues

3.5.1 Poor drainage

Mahasthangarh is located on the high Barind track (Pleistocene land formation), which naturally has numerous natural drainage systems. But over time, due to the enormous modern urban expansion pressure/demand, the historical landscape has been changed with unplanned dwellings, canals, ponds, and various purposes. Long-standing waterlogging, high surface erosion, change in the microclimate, and untimed flooding are the few caused by the poor drainage, which deeply impacted the existing heritage sites. Currently, most of the archeological remains both excavated and unexcavated are buried at the citadel and ancient drainage is no longer in function that was originally interconnected to the river and surrounding moats.

3.5.1.1 Overgrowing vegetation

Microclimate of Mahasthangarh area changed and subsoil water level, moisture content in the air, and even the use of harmful fertilizers and pesticides resulted in the overgrown weed type, different types of grasses, shrubs, moss, undulating, and sycophants roots are common vegetation problems, which cause damage to ancient bricks and diminish the intensity of structure. Apart from these, extensive sun heat, high winds, and earthquakes are one of the major threats to brick-built structures.

4. Role of museum

Presently, as like all site museums of Bangladesh, the Mahasthangarh site museum is solely under the administration of DoA. Site museums play key activities in heritage site management together with keeping education, research, cultural tourism, and description of museum objects [11]. Museums can cooperate with the heritage site management team by helping to safeguard and conserve the archeological heritage sites and monuments *in situ*, and preserving the records of *ex situ*, as well as promoting the archeological heritage through their displays, exhibition, and other programs [1]. But the site museum of Mahasthangarh is not coping with all of the objectives mentioned above.

The collections of museums can motivate communities, groups, and individuals to manage and preserve their tangible and intangible cultural heritage. In the context of Mahasthangarh, site museums could play a valuable role in the protection and promotion of the cultural heritage of Mahasthangarh through education, national or regional functions, and raising awareness in the society about the value of cultural

heritage and the importance of safeguarding for the sake of present and future generations. It can arrange exhibitions and educational activities, such as gallery walks, seminars symposium, training workshops, and conferences with the collaboration of various institutions, stakeholders as well as local communities on a regular basis. Museums can use intangible heritage to develop a better understanding of their visitors. For these museums, there is a need to identify, document, and represent the intangible aspects of their collections. Social communities can use museums as cultural platforms to educate and communicate with their ancestors, improve the museums as a source of knowledge and education as well as progress the practice of protection and preservation of cultural heritage. There is need to enhance the capability of Mahasthangarh site museum officials, particularly in the area of museum management and cultural heritage management both tangible and intangible, predominantly on the basis of UNESCO and ICOM manuals and publications. It is highly necessary for museums and the local community to come together to reduce conflicts or misunderstandings, to safeguard against various threats as well as promote and preserve cultural heritage.

Mahasthangarh archeological museum is one of the major visitor attractions. It often faces excessive pressure on visitors, which is necessary for adequate management of visitors within the museum and other sites. Therefore, controlling is a key to keeping people at a safe distance.

5. Role of community

Community engagement has become a significant approach to protection, management, preservation, and improving both tangible and intangible heritages. Most of the archeological landscape in Mahasthangarh area is owned by the host communities and they are continuously demolishing. Apart from these, many heritage sites are unprotected and some are under the possession of a public authority.

A local site custodian of DoA is conducting site maintenance and management policies. The local community has become an essential part of the site because most of the community is an agrarian society around the heritage sites. There are a large number of tangible heritage sites and numerous intangible heritages that are partially practiced in Mahasthangarh region [12]. So, it can be safely said that, without community engagement, effective heritage management is quite impossible for the local custodians (**Figure 6**).

The Burra Charter addressed that heritage conservation and management will become unsustainable without community/stakeholder engagement [13]. Every year, hundreds of thousands of people of several religions, both national and international, assemble here as part of their religious and traditional festivals and recreation. These kinds of religious and culturally renowned events are utterly involved with tangible heritage. The general vision for community engagement in the Mahasthangarh heritage sites is to ensure the local communities benefit from the safeguarding of the heritage, so that they can connect socially, culturally, or economically with "their" heritage sites.

In the context of a developing country, Bott *et al.* and Driscoll *et al.* experiment the four attributes of stakeholders, where they found every stakeholder has a high legitimacy and sole the local community retains all attributes at the high levels, along with they also found poorly relationship with other stakeholders due to deficiency of proper communication [14, 15].

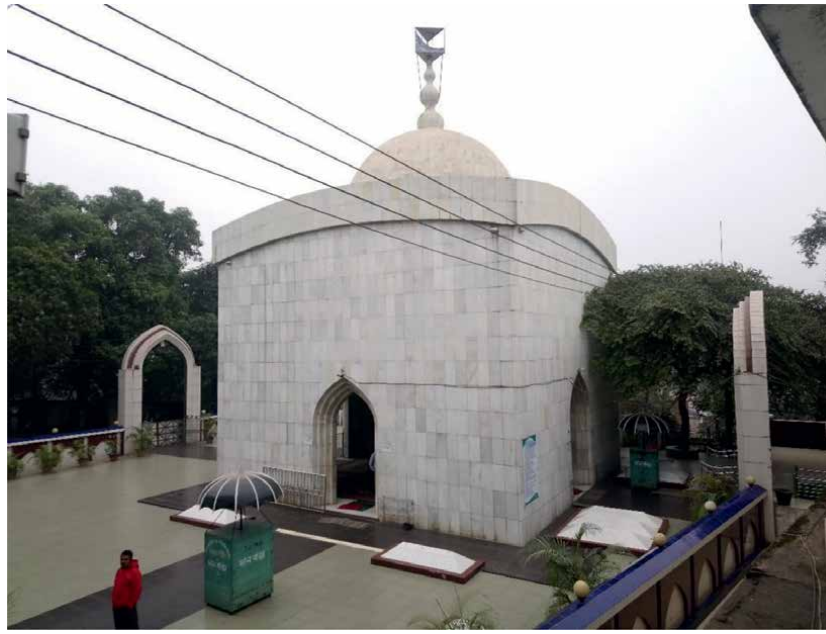


Figure 6.
Tomb of Mir Sayyid Sultan Mahmud Mahisawar of Mahasthangarh, one of the earliest Sufi saints of Bengal.

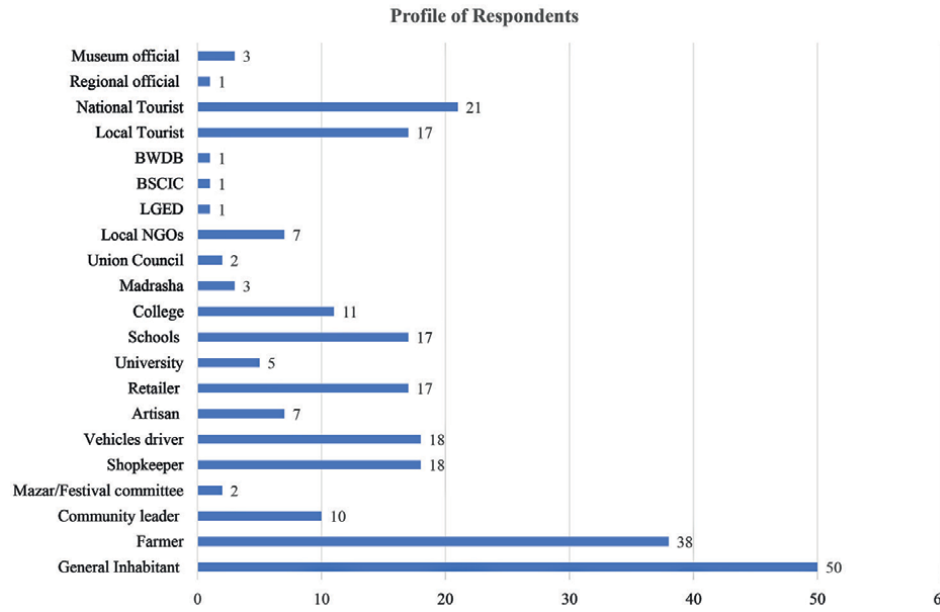


Figure 7.
Bar chart shows the profile of 250 individual respondents, who were interviewed from various sectors with formatted questionnaires.

Local communities would like to participate in heritage management through village tourism, river tourism, and homestay program. For the unprotected and publicly owned heritage sites, it is of vital importance of public participation for

these heritages for their demolition, and safeguarding against threats and challenges. Notwithstanding, community engagement in heritage management is a new concept in this region and can hardly be observed here in Bangladesh. DoA should have to start the effective implementation of the community engagement policy from Mahasthangarh (**Figure 7**).

6. Discussion

Collaboration, cooperation, and engagement of stakeholders are major issues in the heritage management planning process [12]. This research noted that sustainable heritage conservation and management have relied heavily on the active role of museums and engagement of the local communities, in particular, and other relevant stakeholders, in general. Most of the stakeholders, particularly the local community, did not get an invitation from the site manager (**Figure 8**). The site manager needs to prepare a preliminary list of stakeholders and their concerns about heritage sites. Khan details discussed the stakeholders and their possible roles in the heritage management activities of Mahasthangarh [16].

The present site manager of Mahasthangarh and DoA needs to incorporate with the local community through cooperation, dialog, involvement during the decision making, engaging in management activities, and respecting their demands. The same should be maintained for all stakeholders. The social, cultural, and economic benefits of site management and tourism activities should distribute equitably to the men and women of the existing local or host communities at all levels through training, educating, and creating employment opportunities. A significant portion of the revenue of heritage sites particularly comes from tourism should be allotted priority base to the site management activities, socioeconomic development, and poverty alleviation around the heritage site. Local college and school students would like to participate as heritage site interpreters and guides.

There is an urgent need to clearly identify the core zone and buffer zone boundary of the Mahasthangarh heritage site. The delineation of core zone and buffer zone boundaries is an essential requirement in the establishment of effective and

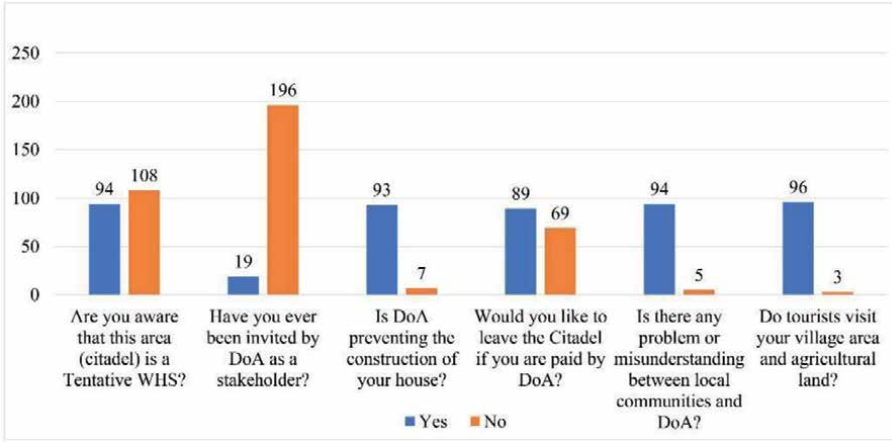


Figure 8.
The bar chart shows the results of "Yes" and "No" questions.

sustainable protection of heritage properties. Boundaries should be drawn to incorporate all the attributes that convey the outstanding universal value (OUV) and to ensure the integrity and/or authenticity of the property [17]. DoA can develop a zoning system in the greater Mahasthangarh territory to provide effective protection to the ruins, including natural heritage, which makes up the cultural landscape to conserve and protect the esthetics values and OUV of the Mahasthangarh.

It is mentionable that in the citadel area, ancient settlements and monuments are located in the eastern part at the same alignment from the north rampart (Jahazghat site) to the south (Mazar area) (**Figure 2**). Primarily, in the context of a short-term plan, the DoA should protect this eastern part with a wall boundary and can develop tourism with a ticket system to earn revenue, which will manage the heritage perfectly. The regular site maintenance and monitoring activities can control and prevent theft, vandalism, and accidental unwitting damage in the Mahasthangarh citadel area as well as ensure the staff and visitors' safety. It is necessary to take plan and policy for the effective management of most potential heritage sites and should be well-planned and long-term policy with regular monitoring on the basis of the National Heritage Act and international standards.

Field assessments suggest local communities have a better understanding of which factors might be damaging to the archeological sites and monuments (**Figure 5**). If the people of the local community get the opportunity to join the site management team as an officer and understand the importance of the heritage sites of the Mahasthangarh, they will notice damaging activities and report such damage to the relevant authorities (museum/site manager). DoA should have to start the effective implementation of community engagement policy from the Mahasthangarh regions.

Every visitor naturally appreciates an amiable welcome and support with any accidental problems. The museum staff and guide need to treat visitors as guests to be welcomed and helped, along with having to protect them from theft or any unwitting damage. It is essential that facilities, including toilets, and shaded areas with seats should be provided. On the other hand, an interpretation center needs to be set up adjacent to the museum and should be made clearly visible to visitors arriving at the site. Most of the respondents don not know the informative history and importance of heritage safeguarding (**Figure 4**). There is a need to publish educational materials, such as Mahasthan children's books, leaflets, souvenirs, booklets, and general books, regarding the importance of heritage protection and make them obtainable at every site and the museum gate. For successful visitor management, firstly, site manager should identify visitors' expectations, needs, and satisfactions.

Interpretation, education, publication, and research are significant factors in effective and sustainable heritage management. The site manager with the help of DoA should establish a permanent research and training center at the site to properly interpret and regular publication with educational materials to provide visitors and research interests. Along with this, there is a need to set up long-term educational programs at and around the site and make sure local educational institutions (schools, college, university, and madrasha) benefit from these functions. The site manager also can develop different types of skills with effective training of the local artisan, handicraftsmen, guide, officer of the museum, and site management team as well as increase proper employment opportunities to enhance the socioeconomic condition of the existing communities around the sites. Almost every inhabitant coexists at the citadel and participates in heritage management through village/rural tourism (60%),

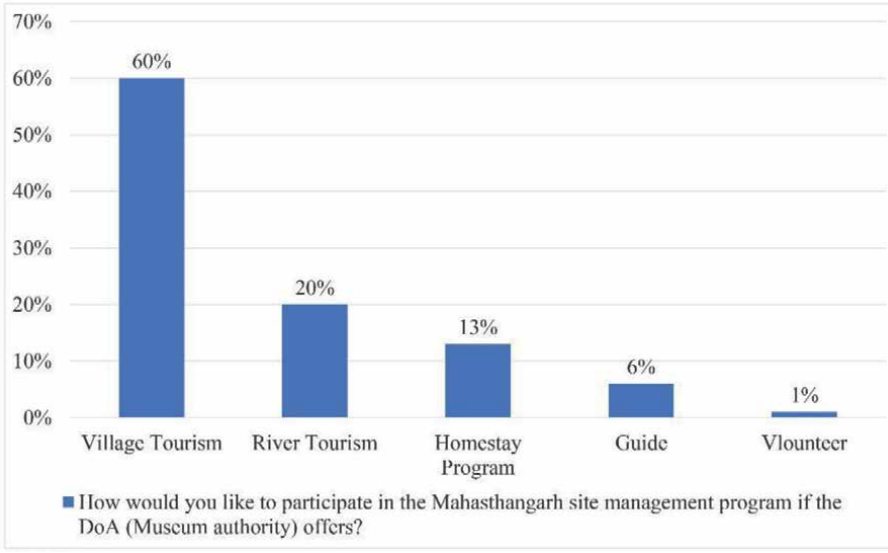


Figure 9.
The bar chart shows the results of the question "how would you like to participate in the site management program if the DoA offers?"

Figure 10.
3D reconstruction model of the archeological complex of the Mahasthangarh citadel, showing the Karatoya River in the eastern side, and the moat surrounding the other three sides of the citadel [12].

river tourism (60%), home stay program (50%), and guide (20%) (**Figure 9**), which will provide socioeconomic and infrastructural benefit to the local communities and regional government resulted in heritage, which will be protected from decay and damage. These tourisms could play an important role in poverty alleviation of Mahasthangarh area. Jahan discussed how and in what ways intangible heritage tourism can play an effective role to improve social benefits and community involvement in protecting and managing the cultural heritage of Bangladesh [18]. It is mentionable that any tourism in the Mahasthangarh area should remember that the main objective is to protect, promote, and manage the tangible and intangible heritage. There are numerous significant intangible cultural heritages that bear the testimony of esthetics and outstanding universal values that need to develop inventories and updated regularly (**Figure 10**) [12].

7. Conclusion

Mahasthangarh area is a huge village and river tourism potential for its charming landscape, massive rampart, river, and deep moat with marshland (**Figures 1** and **2**). The overlooked intangible heritage of Mahasthangarh could be promoted through village/rural tourism and river tourism. Generally, these types of tourism facilitate and promote the regional intangible heritage, such as folklores, handicrafts, traditional songs, dance, foods and games, and also indigenous culture. City dwellers and foreign tourists can enjoy rural culture by spending the night at the citadel area. The promotion, distribution, and sale of local produce, including handicrafts, Bogurar Doi (Yogurt of Bogura), Mahasthan Kotkoti (dry cracker biscuit), and other products should provide a reasonable social and economic return to the local community while ensuring that their intangible cultural heritage integrity is not degraded.

Different types of fair festivals and religious festivals held at the bank of Korotoya River and the Tomb of Sufi saint Mahisawar (**Figure 6**), **which have been conducted by the local communities without any assistance of DoA, where thousands of pilgrims gather every year from home and abroad.** Like many other Mosques and Tomb of Bangladesh, Mahasthangarh Mosque and Tomb are well managed and regularly monitored by local communities, contrariwise ancient mounds are damaging that is managed by only DoA. It is safely assumed that if DoA actively engages local communities through village and river tourism, the heritage of Mahasthangarh will be well managed. Most of the local community and some of the museum officials believe that village and river tourism could bring lots of benefits to the host community and can be an important mechanism for sustainable human development, including poverty alleviation, employment generation, development of rural areas, and progression of women and other disadvantaged groups resulted in local community that would be encouraged to safeguard archeological heritage from devastations for their interest. During the fieldwork, some important needs were identified following the conduct of some tourists. These are transports inside and around the citadel of Mahasthangarh, shady resting place, tourist guide with proper knowledge of the site, enough pure drinking water, safety against beggars, fraudsters, vagabonds, and local vendors.

Most of the respondents are unable to talk about Mahasthangarh without myth and legends; also, they are not aware of the importance of heritage safeguarding (**Figure 4**). Therefore, the heritage of Bangladesh and the importance of heritage protection need to include in the textbook through the national curriculum board.

The present existing Antiquity Act 1968 (amended 1976) is not adequate to conserve and manage the heritage site of Bangladesh. The act should be revised to provide sufficient protection and sustainable management of heritage. The sustainable heritage site management of Mahasthangarh requires a work plan to operate the aims and objectives properly of the entire management activities step by step, and need to be developed annual, short-term (5 years), mid-term (up to 10 years), and long-term (25–30 years), and should be updated with revision.

Author details

Mohammad Mahmudul Hasan Khan* and Mohammad Niamul Huda
Department of Archaeology, Comilla University, Bangladesh

*Address all correspondence to: smkhanju@gmail.com

References

[1] Merriman NJ. The role of museums. In: Hardesty DL, editor. Archaeology II. Paris: UNESCO-EOLSS; 2010. pp. 271-287

[2] Coningham R, Lewer N. Introduction. In: Coningham R, Lewer N, editors. Archaeology, Cultural Heritage Protection and Community Engagement in South Asia. Singapur: Palgrave Macmillan; 2019. pp. 1-16. DOI: 10.1007/978-981-13- 6237-8. ISBN: 978-981-13-6236-1

[3] Huda MN, Khan MMH, Sadequzzaman M. Tentatively listed two promising UNESCO World heritage sites of Bangladesh; Some observations and prospects of the present heritage management scenario. Journal of Bengal Art. 2021;**29**:673-689

[4] Majumdar RC. Rise of Gauda and Vanga. In: Majumdar RC, editor. The History of Bengal, Hindu Period. 2nd ed. Vol. 1. Lohanipur, Patna, India: N.V. Publication; 1971. pp. 47-59

[5] Ahmed N. Mahasthan. Dacca: Department of Archaeology and Museums, Government of the Peoples' Republic of Bangladesh; 1981

[6] Sen PC. Mahasthan and its Environs. Varendra Research Society Monograph 2. Rajshahi: Varendra Research Society; 1929

[7] Salles FJ, Alam S. The Archaeology of Mahasthangarh: Historical and environmental perspectives. In: Salles FJ, Alam S, editors. First (& Second) Interim Report 1993-1999. France-Bangladesh Joint Venture Excavations at Mahasthangarh. Dhaka: Department of Archaeology; 2001/2018. pp. 1-18

[8] Rahman SM. Archaeological investigation in bogra district (from early historic to early medieval period). Dhaka: The International Centre for Study of Bengal Art; 2000

[9] Global Heritage Fund. Saving our vanishing heritage: Safeguarding Endangered Cultural Heritage Sites in the Developing World. Palo Alto: Global Heritage Fund; 2010

[10] PMI. A Guide to the Project Management Body of Knowledge (PMBOK-Guide). 6th ed. USA: Project Management Institute; 2017

[11] Brief P. Role of Museums in Education and Cultural Tourism Development. Kyiv: Ukrainian Committee of ICOM; 2012

[12] Khan MMH. Heritage Site Management of Mahasthangarh, Ancitent City of Bangladesh; Reappraisal Problems, Prospects and Propositions, unpublished [PhD thesis] Department of Archaeology, Dokuz Eylul University, Izmir, Turkey. 2021

[13] Charter B. The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance. Australia: Burra; 2013

[14] Bott AL, Grabowski S, Wearing S. Stakeholder collaboration in a prospective world heritage area: The case of Kokoda and the Owen Stanley ranges. Cosmopolitan Civil Societies Journal. 2011;**3**(2):35-54. ISSN: 1837-5391

[15] Driscoll C, Starik M. The Primordial Stakeholder: Advancing the conceptual consideration of stakeholder status for the natural environment. Journal of Business Ethics. 2004;**49**(1):55-73. DOI: 10.1023/b:busi.0000013852. 62017.0e

[16] Khan MMH. Role of stakeholders in heritage management in Bangladesh: A case study of Mahasthangarh. CenRaPS Journal of Social Sciences. 2020;**2**(3):354-372. DOI: 10.46291/cenraps.v2i3.40

[17] UNESCO Operational Guidelines. Operational Guidelines for the Implementation of the World Heritage Convention. Paris: World Heritage Center; 2019

[18] Jahan SH. Communities and micro-heritage in Bhitargarh, Bangladesh: A case study. In: Coningham R, Lewer N, editors. Archaeology, Cultural Heritage Protection and Community Engagement in South Asia. Singapore: Palgrave Mecmillan; 2019. pp. 17-30. DOI: 10.1007/978-981-13-6237-8. ISBN: 978-981-13-6236-1

Section 2

Conservation of Urban and Architectural Heritage

Chapter 5

A Conceptual Framework for Conserving Architectural Heritage in Graeco-Roman Egypt: A Goals-and-Applications Approach

Marwa Elkady

Abstract

In Graeco-Roman Egypt, rulers shared the tradition of rebuilding structures. A great deal of attention was paid to conservation to preserve the characteristics associated with these buildings as perceived by the Egyptians. Conservation programming was implemented to achieve different political, economic, and cultural objectives. In this chapter, we examine the concept of conserving architectural heritage at that time by employing historical methods to study the historical environment of that era. We also use descriptive methods to study the conservation program applied by the rulers then. This is followed by an analytical study of the historical and archaeological specifics, and finally, a deductive method is used to indicate the outcomes and key findings. Moreover, the chapter outlines a theory for reviving the past through architectural heritage conservation in an analogous way to Graeco-Roman Egypt. Finally, the chapter ends with the main finding that reconstruction as a means of architectural conservation was a strategy perused in Graeco-Roman Egypt to serve political rather than cultural or religious goals. In addition, compared with contemporary reconstruction projects, the concepts are totally different. Architectural conservation today is primarily linked to cultural purposes and the desire to preserve the past rather than achieve political goals.

Keywords: Graeco-Roman, reconstruction, Egypt, conservation, heritage

1. Introduction

It has become increasingly important to conserve heritage not only for tangible legacy but also for intangible legacy in our modern world. Conservation is defined according to UNESCO as "the operations which together are intended to prolong the life of an object by forestalling damage or remedying deterioration [1]". The principal aim of conserving architectural heritage accordingly is "to maintain the physical and cultural characteristics of the object to ensure that its value is not diminished and that it will outlive our limited time span [2]". Thus, conservation operations are primarily concerned with preventing the loss or damage of architectural heritage through

preventative and remedial actions [3]. Heritage conservation emphasizes that the context or setting of an early building is part of its significance. This significance of a building may be diminished if its early context is taken away [4].

In this chapter, we will travel to ancient times to explore another perspective on architectural heritage conservation, specifically Graeco-Roman Egypt, where the primary aim was to preserve the ancient setting and traditional significance of the buildings. It was different in terms of goals and applications. The goals were not focused on preserving cultural heritage or traditions, nor were the standards and criteria for conservation the same as today. These practices had more to do with maintaining the authority of the kings and rulers over the people. Thus, in Egypt, conserving cultural heritage had political and perhaps economic implications rather than cultural ones. What are the reasons beyond these goals? How did they achieve these goals through cultural heritage conservation? Further, it is also crucial to investigate the possibility of a modern version of the same concept. There are two more questions that may arise in this context: Can the same concepts of conserving cultural heritage be applied today? Are the goals the same? Do they follow the same standards and procedures as Graeco-Roman Egypt? As we discuss these conditions in Graeco-Roman Egypt and measure their impact on our modern lives, the next few paragraphs of this chapter will attempt to answer these questions.

2. Methodology

To find proper answers to the above-mentioned questions, we must sail back to ancient Egypt and study its history using the historical methods in order to get a complete picture of all the circumstances of the Ptolemaic and Roman rulers. As we sail deeper into the past using the historical methods, exploring the political and cultural concepts of the rulers, understanding why they pursued the policy of architectural conservation of the ancient Egyptian temples. To be able to fulfill this goal, it was important to look further back in the past to Pharaonic Egypt, when Egypt was ruled by ancient Egyptian pharaohs and not foreigners. This step is so important for this type of study to point out the true significance of the Egyptian temples and that they did not only play a religious role, but social and political roles as well. Then the study moves forward to explore the Graeco-Roman period in Egypt, distinguishing between the nature of the two eras and their rulers: the Ptolemaic and Roman. At this point, the chapter indicates in brief the history of Ptolemaic how religion was of a great priority to the population and thus conserving temples was in a way or another an essential medium for the foreign Ptolemaic ruler to gain the hearts of his Egyptian people. Then, we move forward using the same historical methods to see how the Roman emperors (as rulers of Egypt in the Roman period) used the same way the Ptolemies had. This is done by explaining how they used the same administrative and religious policy as their predecessors and thus followed their footsteps regarding architectural conservation of the Egyptian temples, whether by restoration, preservation, or reconstruction.

The following step used in the methodology of this chapter is the descriptive methods. It is so important after declaring the main historical points of the era which this chapter talks about (the Graeco-Roman) to utilize the descriptive methods to describe and designate the different monuments and ancient temples which are the actual evidence and tangible proof of the care and attention paid by the rulers

of Graeco-Roman to have a program of architectural conservation. In this part of the study, we go through the description in detail of the reconstruction of the main Egyptian temples during the Graeco-Roman period, including the temples of Dendera, Esna, Edfu, Kom Ombo, and Philae (**Figure 1**). Further, the descriptive methods are also used to indicate other restoration works done to Egyptian temples during the same period in different parts of Egypt in prominent cult centers like Memphis and Heliopolis.

The next step is to use the analytical methods. It is a crucial point in this study as it is the method that will be used to reach the answers already asked at the beginning of the chapter. The analytical methods are applied here through analyzing two parts: first, the historical background of Egypt during the Graeco-Roman period, politically, socially, and religiously. Second, the archeological evidence which is well indicated by the great monuments and temples remaining from the Graeco-Roman Period. Following the analytical methods in this study is particularly pertinent to comprehend how and why architectural conservation was of a high priority for the rulers of Egypt at that time, their real targets, and the types of conservation they favored.

Finally comes the deductive methods as the last methodology used in this chapter by which the answers to the questions in the introduction and the key findings can be reached.

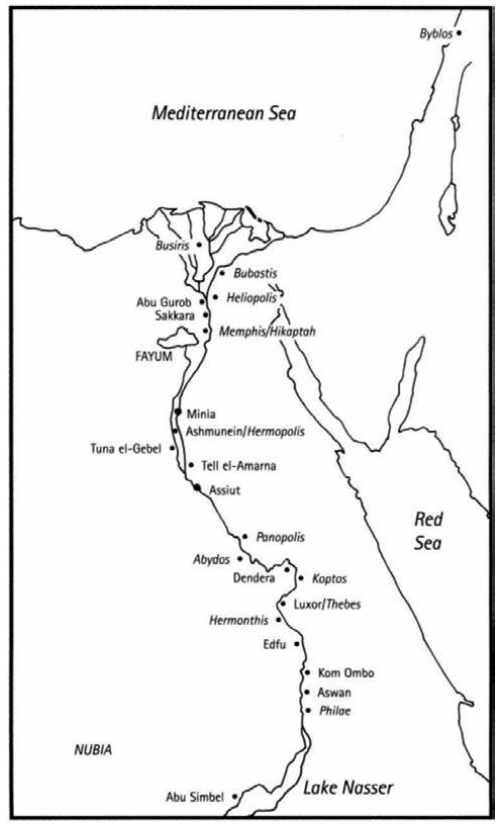


Figure 1.
Map of ancient Egypt. Armur R. gods and myths of ancient Egypt. 2nd ed. Cairo & new York: The American University in Cairo press; 2001.

3. Egypt under the Ptolemaic and Roman rules

The Graeco-Roman period in Egypt is divided into two eras: the Ptolemaic and the Roman. The first starts with the invasion of Alexander the Great to Egypt in 332 B.C. The Egyptians looked at Alexander not as a conqueror, but as a savior. This is due to the fact that the Egyptians had long considered the Greeks their ally, who had aided them long in their struggle against the Persians who were ruling Egypt then. Alexander was keen to prove to the Egyptians that he was not a conqueror to assure their loyalty and accept him as their ruler. He adopted the traditional Egyptian protocol of the Egyptian pharaohs. He started this protocol by visiting the city of Heliopolis, the cult center of the great Egyptian god Re, the god of the sun. He then moved to the city of Memphis, the capital of Egypt at that time where he had himself crowned as an Egyptian pharaoh along the same ancient Egyptian traditions. Moreover, Alexander paid a great attention to show his respect to the Egyptian divinities. He made offerings to the Egyptian gods, especially the god Apis in the temple of Ptah at Memphis. As a result, Alexander the Great was cheerfully accepted by the Egyptians as their pharaoh who saved them from the unmerciful Persians. Alexander decided to visit the temple of Amun (that was also known as Zeus-Amun) at Siwa Oasis in the Western Desert of Egypt in order to inspire the famous oracle of this god. He had certain aims when he decided to do that: First, to assure his rule in Egypt by proving that he was a descendant of the Egyptian gods following the Egyptian traditions of the pharaohs. Second, to prove to the world that the great god Zeus-Amun was supporting him in his ambition to control the world under his rule. Third, to pursue the same policy of the Greek heroes like Hercules and Perseus, who were said to have had inspired the oracle of Zeus-Amun in Siwa before setting out for their labors. It was on his journey to visit the temple via the coastal way did Alexander decide to found the new city of Alexandria [5].

With the death of Alexander the Great in 323 B.C, a new age called the "Hellenistic Age" started which synchronized the rule of the Ptolemaic Dynasty. After Alexander's death, his generals decided to divide the empire into satrapies (states) under the highest-ranking generals and the royal guards of Alexander. Ptolemy, son of Lagos, was allotted the satrapy of Egypt. He is Ptolemy I Soter, the "savior", and the founder of the Ptolemaic Dynasty in Egypt. To assume the title of "king" in 306 B.C, he decided to follow the example of Alexander and had himself crowned as a pharaoh in the temple of Ptah in Memphis. The following year 305 B.C [5] was counted in Egyptian Demotic documents as the first year of Ptolemy's kingship. Ptolemy at first kept Memphis as a capital during his satrapy. In 311 B.C., he moved his residence to Alexandria, the new capital of Egypt [6]. Ptolemy I was succeeded by fourteen Ptolemies whose rule ended with the death of Cleopatra VII and her son Ptolemy XV Caesarion in 30 BC [7].

There must have been certain impacts on the Egyptian population from different perspectives because of the transition from the Pharaonic to the Ptolemaic Dynasty. Different Egyptian cities, particularly in Upper Egypt, where most ancient Egyptian pharaohs originated, regarded the Ptolemaic kings as foreigners. The Ptolemaic kings succeeding the throne were symbols of Egyptian-Greek society, and they represented it in great harmony. They adopted the traditional Egyptian customs and titles and were represented as Pharaohs on the walls of Egyptian temples in order to legitimize their rule [6]. Hence, the Ptolemies to obtain political control over Egypt perused this policy, being depicted as pharaohs

in sculpture and temple decorations and were represented as pharaohs, which is a tradition that Alexander the Great himself had started. Good examples of the typical Pharaonic Egyptian scenes adopted by the Ptolemies are: "the king smiting enemies" (**Figure 2**), "purification of the crowned king" (**Figure 3**), and "foundation of the temple [8]", besides the common offering scenes (**Figure 4**). At the same time, they kept to have their Greek image, so they were also portrayed on coins as Greek kings wearing a Greek diadem [9].

The second era of the Graeco-Roman period is the Roman which starts in 30 B.C. after the death of Cleopatra VII when the Roman Command Octavian (who later became a Roman emperor and assumed the title of August) took control over Egypt and annexed it as a province to the Roman empire. Octavian on entering Alexandria gave a speech to the Alexandrians in Greek, in which he assured his respect to Alexander the Great and presented himself as the successor of the pharaohs. He also paid homage to the body of Alexander and placed a golden crown on his head [10]. For the Egyptians, Augustus was the pharaoh [11]. They granted him the traditional titles and sacredness of their pharaohs. He appointed a Praefectus Aegypti the

Figure 2.
The Ptolemaic king is smiting the enemy in front of the god Horus, Temple of Edfu.

Figure 3.
The Ptolemaic king purified by the Egyptian gods thot and Horus. Temple of Kom Ombo.

Figure 4.
Offering scene from the temple of Edfu.

"Roman ruler of Egypt" and deputy of the emperor who held the military authority to command the Roman legions in Egypt [12]. Augustus beside the Annona (annual tribute paid to Rome) also imposed a poll tax known as Laographia obligatory on all the Egyptians [13]. This situation lasted till the division of the Roman Empire into two, when Egypt became subjected to the eastern empire, the Byzantine and ruled by Byzantine emperors [14].

Most of the administration system remained in the Roman period the same as it had been in the Ptolemaic period, except some a few modifications [15]. Like the Ptolemies, the Roman emperors were regarded as pharaohs and were represented on the walls of the temples wearing the traditional Egyptian royal costumes and crowns and holding the same Egyptian royal emblems and insignia with their names inscribed inside cartouches like Egyptian pharaohs [16]. The Romans came at the top of the society, followed by the Greeks and then the Jews. The last class of the society was the Egyptian peasants and artisans, who could not join the army and paid the full poll tax. Despite that, the Egyptians during the Roman period retained their traditions. They spoke their language and worshiped the Egyptian gods [17]. The Alexandrian triad (consisting of Serapis, Isis, and Harpocrates), however, had a great influence in the Roman period. Besides the national cults, there were imperial cults for the emperors who were deified by special priests in Alexandria, and statues were made in their honor in the temples [18].

4. Program of architectural conservation of Egyptian temples

The king according to the ancient Egyptians was the living god on earth who played the role of a mediator between the common people and the divine power of the gods in the heavens. Therefore, the Egyptian king, the pharaoh was divine, regarded as the living image of the god Horus ruling on earth. Horus was the falcon-headed god that represented kingship in heaven. The pharaoh had to hold a Horus name as one of his four

principal royal titles. This concept of kingship was basic throughout the ancient history from prehistoric times up to the Roman period. When the Ptolemies rose to the throne of Egypt, they retained the same royal traditions and adopted many aspects of Egyptian political structures and social order to legitimize their rule as a key to strengthening their control over the country and the Egyptian population. Observing and accepting the Egyptian gods and divinities was the shortest way to the hearts of the Egyptians, confirming their rule as successors of the Egyptian pharaohs and not as foreign rulers.

Temples remained the focal point of social, economic, and cultural life, in the traditional Egyptian style. The Ptolemaic rule, therefore, is characterized by a rigorous program of temple construction and conservation, including the completion of projects left over from previous times, restoration of many older or neglected structures, and reconstruction of others. Additionally, the Ptolemaic kings generally aimed at conserving the Egyptian temples by adhering to the Egyptian traditional architectural styles and motives to preserve the traditional meanings inherited from the Pharaonic period. The Ptolemaic rulers to emphasize the same concept of being sons of gods, they created the Mammisi or the birth-houses (**Figure 5**), which were so common in temples complexes in Graeco-Roman Egypt in order to associate a local child divinity with that of the Ptolemaic king [9].

The Roman emperors were not far from the same concept the Ptolemaic kings had adopted. Their commitment to protecting Egyptian traditions and cultural heritage was reflected in their preservation of Egyptian temples, which embodied the architectural heritage. They followed the same guiding steps of the Ptolemies and were keen to complete their architectural works in the Egyptian temples. Like the Ptolemaic rulers, the Roman emperors used the conservation of the architectural heritage program in temples to gain legitimization in the eyes of the Egyptians in order to be able to rise to the Egyptian throne, emphasizing the same concept of being successors of the Egyptian pharaohs rather than being foreign rulers.

Throughout the Graeco-Roman period, based on the previously declared political and cultural concepts, many temple sites all over Egypt witnessed a large program of architectural conservation. The conservation works were done mainly through restoration and reconstruction. Among the conserved sites that still stand today as a witness of the great conservation works undertaken during the Graeco-Roman period are the great temples of Dendera, Esna, Edfu, Kom-Ombo, and Philae (**Figures 1, 6–11**), where the Ptolemaic kings and Roman emperors are

Figure 5.
Mammisi (birth house) of Dendera.

depicted on the walls as Egyptian pharaohs performing the traditional Egyptian rituals in front of traditional Egyptian divinities and accompanied by Egyptian hieroglyphic signs along with the cartouches enclosing their names transcribed into a hieroglyph. They all reconstructed over much older temples on the same sites following the previous traditional Egyptian plans. Clearly, the ancient Egyptian priests did not give much thought to the origins of the new rulers on the throne; they were more concerned about preserving their religious and cultural traditions, divinities, and rituals [8].

4.1 Temple of Dendera

The city of Dendera lies on the western bank of the Nile, about 74 km north of the city of Luxor. It was the capital of the sixth nome of Upper Egypt. The cow goddess Hathor who was identified with the Greek goddess Aphrodite was the principal divinity of the temple of Dendera (**Figure 6**). The existing building of the temple dates back to the Graeco-Roman period [19]. However, the temple had Pharaonic roots dating back to the Old Kingdom [20]. The first temple was built by king Khufu (ca. 2551–2528 B.C.) of the fourth dynasty and restored later by the king Pepi I (ca. 2289–2255 B.C.) of the sixth dynasty, whose name is inscribed in one of the underground crypts. The temple was reconstructed later by Thutmose III (ca. 1479–1425 B.C.) in the eighteenth dynasty [21].

It was under Ptolemaic rule and particularly from the time of Ptolemy VIII Euergetes II (170–116 B.C.) that the temple gained more attention and witnessed great conservation and reconstruction works. The standing body of the great temple of Hathor itself is dated to the 16th of July 54 B.C., in the time of Ptolemy XII Auletes (80–54 B.C.). Cleopatra VII (51–30 B.C.), the last ruler of the Ptolemaic Dynasty, who completed the reconstruction of the temple also has a marvelous scene in bas-relief with her son Caesarion on the outer rear wall of the temple represented in pure Egyptian style (**Figure 7**). The reconstruction works and decoration of the temple were completed in the Roman period, specifically in the reign of the emperor Tiberius (14–37 A.D.). This is proved by a Greek inscription of dedication on the upper edge of the cornice of the great hypostyle hall. In other words, the renovation of the existing temple structure was finished in the year 34 A.D. The decoration of the temple continued by the successive Roman emperors Caligula (37–41 A.D.), Claudius (41–54 A.D.), and Nero (54–68 A.D.). The northern gateway shows scenes of the Roman emperors Domitian (81–96 A.D.), Nerva (96–98 A.D.), and Trajan (98–117 A.D.) [22]. As is evident, the whole temple was designed and decorated in Egyptian style

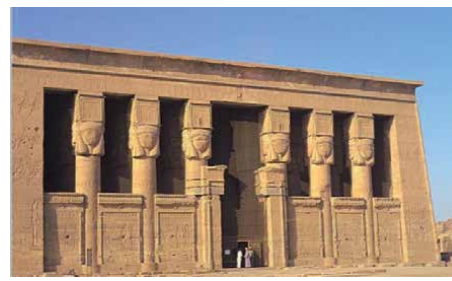


Figure 6.
The temple of Dendera.

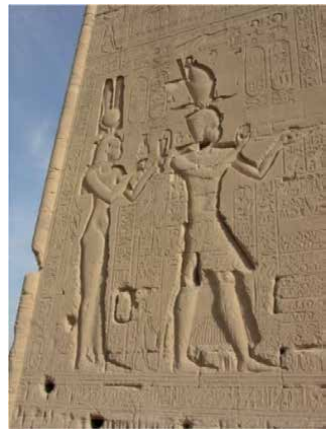


Figure 7.
Scene of Cleopatra VII and her son Ptolemy Caesarion on the rear wall of the temple of Hathor in Dendera.

as the goal was to preserve cultural heritage (in this case the religion and rituals) through architectural conservation.

4.2 Temple of Esna

The city of Esna lies on the western bank of the Nile, about 50 km to the south of the city of Luxor. Today only the great hypostyle hall of the temple still stands (**Figure 8**). The temple was mainly dedicated to the ram-headed god Khnum, the creator ram god, who created beings on his potter's wheel, along with other divinities, especially Neith represented as a lady, Tefnut and Menhit as lioness goddesses [23]. The structure of the standing part of the temple is dated to the Ptolemaic period and its decoration to the Roman. However, the original temple dates back at least to the eighteenth Pharaonic dynasty, specifically the reign of Thutmose II (ca. 1492–1479 B.C) as the jamb of the gateway shows. This means that like that of Dendera the temple of Esna was reconstructed in the Graeco-Roman period. The oldest Ptolemy's name found on the walls of this temple is that of Ptolemy III Euergetes I (246–221 B.C.), who is represented on the rear side wall of the temple accompanied by a pet lion while he is smiting his enemies. Ptolemy VI Philometor (180–145 B.C.),

Figure 8.
Remaining part of the temple of Esna.

whose name is inscribed on the rear wall of the hypostyle hall along with the names of Ptolemy VIII, Eurgetes II, and his wife Cleopatra II. The work was resumed in the Roman times when the temple was completed and decorated [24]. Therefore, the scenes and titles on the walls bear the names of Roman emperors; mainly Claudius (41–54 A.D.), Nero (56–68 AD) Vespasian (69–79 A.D.), Domitian (81–96 A.D.), Trajan (98–117 A.D.), Hadrian (117–138 A.D.), Antoninus Pius (138–161 A.D.), Commodus (161–180 A.D.), Severus (193–211 A.D.), Caracalla (211–217 A.D.), and Decius (249–251 AD). It is obvious that the largest portion of the existing temple is dated from the Roman period. However, the style is totally Egyptian to strengthen the Egyptian tradition and preserve the Egyptian cultural heritage by reconstructing the temple along the Egyptian style [25].

4.3 Temple of Edfu

Edfu is a city that lies between the two cities of Esna and Aswan, about 100 km to the south of the city of Luxor. In the Græco-Roman period, it was the capital of the second nome of Upper Egypt. The temple of Edfu was dedicated to the chief falcon god Horus Behedety (meaning Horus of Edfu), who was identified with the Greek god Apollo [26] (**Figure 9**). The temple of Edfu is the best-preserved Egyptian temple. In addition, it reflects with its artistic and architectural features the styles of art and architecture in Ptolemaic Egypt. The texts on the outer face of the girdle wall indicate that this building was raised in the Ptolemaic period on the plan of the original Pharaonic temple that had been designed by Imhotep, the vizier and architect of the king Djoser from the third dynasty (ca. 2630–2611 B.C.) [27]. In addition, the base of a pylon which dates to the Ramesside period, specifically of Ramsses III (ca. 1184–1153 B.C.) from the twentieth dynasty, was revealed east of the temple. The oldest crypts of the temple date back to the eighteenth dynasty [28]. This indicates that parts of the original Pharaonic temple were restored during Ptolemaic time, while others were reconstructed thoroughly during the same period.

The existing body of the temple was a reconstruction that started in the time of Ptolemy III, Euergetes I in 237 B.C as the foundation text on one of the outer walls indicates [25]. The building was completed in 212 B.C. under the reign of Ptolemy IV Philopator (222–205 B.C). The first hypostyle hall was constructed in the time

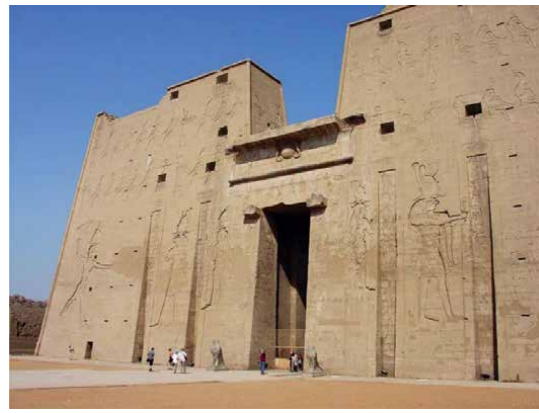


Figure 9.
Temple of Edfu.

of Ptolemy VIII, Euregetes II, while the pylon, the forecourt, and the enclosure wall were built during the time of Ptolemy IX Soter II (116–80 B.C.) and Ptolemy X Alexander I (107–88 B.C.), but the decoration was finished in 57 B.C. under Ptolemy XII Auletes, father of Cleopatra VII, the last Ptolemaic ruler. This means that the temple took about 180 years to be completed. This is due to the several interruptions caused by the troubles of revolutions that rose against the Ptolemies from time to time [29]. Like the previously mentioned two temples, the whole temple of Edfu was reconstructed in the Ptolemaic period, but on the same Egyptian traditional style and architecture to claim the inheritance of the Egyptian throne by conserving Egyptian architectural traditions.

4.4 Temple of Kom-Ombo

The ancient town of Kom Ombo lies on a small mount, which rises to about 18 m above the level of the plain. It is located on the eastern bank of the Nile at about 42 km north of the city of Aswan and 165 km south of the city of Luxor. It was only in the Græco-roman period that this town gained its importance when it became the capital of a separate nome called Orembite. The temple of Kom Ombo is unique in the fact that it is a double temple dedicated to the cults of two principal opponent deities, namely Horus the falcon god and Sobek the crocodile god (**Figure 10**). Various fragments on the site indicate that the existing temple was constructed on another one dated to the Pharaonic times of the Middle and New Kingdoms. The site of the temple also contains traces of additions that had been made to the temple in the New Kingdom from the eighteenth and nineteenth dynasties. The temple was reconstructed in the Ptolemaic period under Ptolemy VI Philometer in 181 B.C. However, most of the reconstruction works were made during the reign of Ptolemy VIII Euregetes II. The work was then suspended and continued later under Ptolemy XII. However, other additions and decorations were undertaken later under the Roman emperor Tiberius. The scenes and inscriptions on the walls of the temple also bear the names of other Roman emperors, who must have had works in the temple like that of Domitian [23], Geta, Caracalla, and Macrinus. This means that the reconstruction and decoration of the temple took about 400 years to be completed. Despite the special characteristic of this temple as a double temple and the long time it took to be

Figure 10.
Temple of Kom Ombo.

reconstructed, it witnessed different ears and political changes. It retained the same Egyptian traditional style in all its parts in such great harmony.

4.5 Temples of Philae

Philae is a tiny island in the Nile lying at the first cataract, about 5 km from north to south and 1.50 km from east to west. On the island of Philae rise a number of Egyptian temples and constructions dating from different periods. The oldest known monument on this island is an altar built by king Taharqa (ca. 690–664 B.C.) of the twenty-fifth dynasty. However, the earliest still standing building on the island was erected by king Nectanebo II (610–595 B.C.), of the thirtieth dynasty. The importance of the island of Philae grew when it became the cult center of the goddess Isis at least from the twenty-sixth dynasty. It was during the Græco-Roman period that the island witnessed its greatest glory as the goddess Isis that resided on Philae at that time received one of the greatest cults, not only in Egypt but in the Graeco-Roman as well. The cult of Isis remained on this island till the sixth century A.D. when the temple was officially closed, long after announcing Christianity as the official religion in the Roman Empire. Under the command of Theodorous in 577 A.D. parts of the temples of Philae were converted into churches. Due to the construction of the High Dam in 1960, the island and the temples were threatened by the complete disappearance under the Nile waters. To solve this, the Egyptian government made an appeal to the organization of UNESCO to save the monuments. The temples were dismantled and rebuilt on another nearby island called Agilika. The new island of Philae was officially opened to the public in 1980 [19].

The island of Philae is famous for the great temple of Isis (**Figure 11**), which was started by Ptolemy II Philadelphos (285–246 B.C.) and finished by Ptolemy III Euergetes I (246–221 B.C.), while the decoration was resumed in later periods. Preceding the pylon are two red granite statues representing two lions dating from the Roman period [30] (**Figure 12**). Behind these two lions once stood two red granite

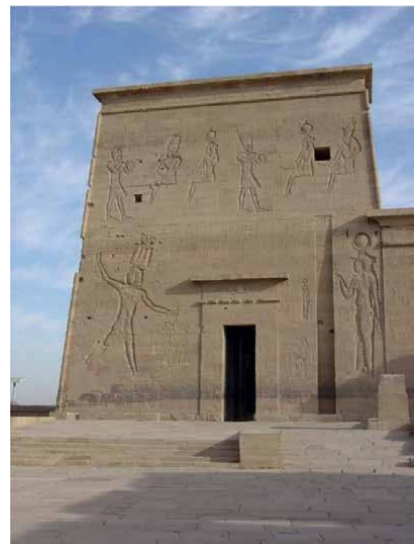


Figure 11.
Temple of Isis on Philae Island.

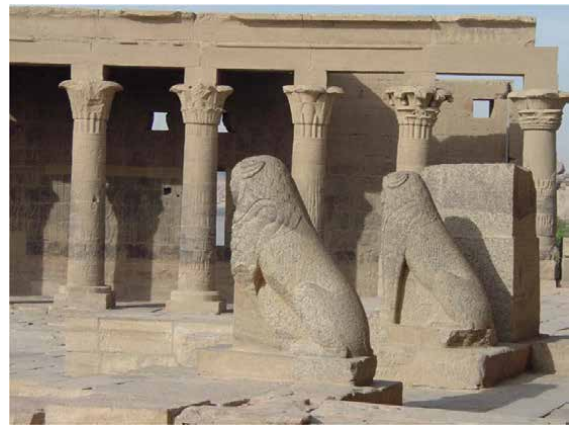


Figure 12.
*Two Roman lion statues preceding the temple of Isis on Philae Island. *pictures were taken by the author.*

obelisks erected by Ptolemy VIII Euregetes II and his wife Cleopatra III. The decoration of the pylon continued during the reigns of Ptolemy VI and XII. Columns in the hypostyle hall of the Isis temple built under Ptolemy VI [23]. A lot of restoration, additional and decorative works were undertaken under the Roman emperors from the time of Tiberius through to the reign of Diocletian at the end of the third century A.D [31]. Like the previous temples, these of Phila were also constructed by Ptolemaic kings and decorated by Roman emperors along the same traditional lines and style, to preserve Egyptian architectural tradition as evidence of being descendants of Egyptian pharaohs.

4.6 Other conservation and reconstruction works in Graeco-Roman Egypt

Temples played a major role in royal success throughout ancient Egyptian history. They were rich and powerful institutions that owned areas of land, exempted from taxes, and given privileges [25]. The Egyptian traditions greatly influenced society during the Graeco-Roman period. The Greeks and later the Romans who lived in Egypt worshiped Egyptian deities as manifestations of Greek and Roman divinities. Thus, Greek gods and goddesses were identified with Egyptian counterparts. For example, at Edfu the Greeks worshiped Horus as Apollo and at Akhmim, and they worshiped the Egyptian god of fertility Min as the Greek god of woods Pan [9]. Nevertheless, following the role model of Alexander the Great, the Ptolemies adopted Egyptian traditions and culture. They were great conservators and restorers and undertook great projects to retain the cultural and religious heritage of the pharaohs. This strategy of the rulers in the Ptolemaic period was adopted during the Roman period as well. The Roman emperors paid great attention to conserve the Egyptian religious heritage on the previously mentioned important temples and others by completing buildings and decorating temples that had been reconstructed during the Ptolemaic Period. Like the Ptolemaic kings, the Roman emperors were represented in the traditional Egyptian kings wearing the same costumes and doing the same rituals before the Egyptian divinities.

The restoration and reconstruction programs were not limited to the five mentioned sites, but also included other important religious sites and cult centers that had received great prestige in Pharaonic Egypt. Memphis, which once had been the capital

of Egypt before Alexandria, the cult center of the god Ptah, kept on having great religious influence. In Graeco-Roman period, it was the second capital. The Ptolemaic rulers were crowned in the Memphite Ptah temple as a tradition like the Egyptian pharaohs had before [31] and gained great priestly prestige as they gave in return privileges to the temples and priest. [9] Heromopolis Magna (modern Ashmunein) (**Figure 1**) was a cult center of Thoth, the god of wisdom. A Hellenistic-style temple was reconstructed during the Graeco-Roman period there to be dedicated to Thoth on the remains of the Pharaonic temple, where a few evidence indicate the existence of parts from the time of Amenhotep III in the eighteenth dynasty [32]. Thebes remained the cult center of the great god Amun-Re. His temples at Karnak, Madinet Habu, and Luxor witnessed important restoration, reconstruction, and additions as parts of the conservation program of the great Egyptian temples process in the Graeco-Roman period [33]. Other religious regions all over Egypt witnessed the same strategy of conserving Egyptian temples either by restoration or by reconstruction including the temples dedicated to local gods of the oases (Siwa, Bahariya, Dakhla, and Kharga) in the Western Desert [34] and in Upper Egypt in the cities of Fayum, Armant, Coptos, Medamud, Tod, and Akhmim, and Nubia (**Figure 1**).

5. Reconstruction as a mean of architectural heritage conservation

The term conservation refers to all the activities carried out to ensure the preservation of a place's historical, architectural, esthetic, and/or cultural significance. This can include maintenance, restoration, reconstruction, or combining more than one process together [35]. Reconstruction, as the word implies, refers to the process of rebuilding or reproduction. It is simply "evocation, restoration or replication of a previous form" and "the purpose of reconstruction is to maintain and reveal the significance of cultural heritage" [36]. Reconstruction is generally understood in architecture to be a process by which architects reproduce past buildings visually. In this context, it can refer to work executed either with modern or old materials, or a mix of both. In this work, dismembered or destroyed elements, or parts thereof, are rebuilt. Hence, reconstruction mainly aims to restore a place as close as possible to its earlier state, including the former appearance of the historical structure, architectural monuments, or parts of structures that have been severely damaged, demolished, or greatly altered, and brings them back to life.

The history of mankind is filled with examples of reconstruction as a method of conservation. Up to the middle of the nineteenth century, restoration involved repairing buildings and structures [37]. It was during World War I that the idea of undertaking a conservation operation to completely rebuild a destroyed architectural work came to light. People bitterly felt their losses when historic urban areas were destroyed, especially when it came to the sense of cultural identity that was associated with familiar surroundings. Following the World War II, when dozens of historic towns were destroyed, much rebuilding was required [38].

During the Second International Congress of Architects and Technicians of Historic Monuments in Venice in 1964, the Venice Charter for the Conservation and Restoration of Monuments and Sites was adopted. Later, the ICOMOS Charter was adopted as the founding ethical document at its establishment in Poland the following year (1965). The Venice Charter was also used as a reference point for cultural World Heritage Sites when the World Heritage Committee met for its first session in 1977. As a matter of principle, the Charter favored the conservation and restoration of

monuments and sites and strongly opposed reconstruction work then. Accordingly, Anastylosis, or the reassembling of existing but broken parts, was the only procedure permitted. A broader perspective was provided in 1983 by the Operational Guidelines for the Implementation of the World Heritage Convention. In light of that, a certain number of requirements had to be met before any reconstruction could take place, such as cultural properties must meet a standard of authenticity in design, materials, workmanship, and setting. The Committee stressed that reconstruction should only take place on the basis of detailed and complete documentation about the original and not based on conjecture [39]. Reconstruction of buildings is also addressed in the Operational Guidelines for the Implementation of the World Heritage Convention in 1983 as follows: "In relation to authenticity, the reconstruction of archaeological remains or historic buildings or districts is justifiable only in exceptional circumstances. Reconstruction is acceptable only on the basis of complete and detailed documentation and to no extent on conjecture". The revised version (1999) of the Burra Charter of Australia ICOMOS, states Article 1.8. Reconstruction means returning a place to a known earlier state and is distinguished from restoration by the introduction of new material into the fabric. Article 20.1. Reconstruction is appropriate only where a place is incomplete through damage or alteration, and only where there is sufficient evidence to reproduce an earlier state of the fabric. In rare cases, reconstruction may also be appropriate as part of a use or practice that retains the cultural significance of the place. 20.2. Reconstruction should be identifiable on close inspection or through additional interpretation [39].

In spite of the fact that reconstruction may prove to be an appropriate strategy of conserving architectural heritage, its effectiveness is doubtful when it is used to improve the appearance of heritage sites, unless it is based on accurate archeological and architectural documentation or evidence. It might be justified under certain circumstances, such as to protect the monument from floods or pollution threats, or any catastrophe [40]. Reconstructions of ancient buildings that are in a ruinous state or have been lost to time typically involve detailed restorations and restitution [41]. As such, the reconstruction process is about increasing the importance of the meanings and the values the contemporary building carries rather than the physical fabric of the historic architecture itself. It is the stories and cultural heritage connected with historic places that are of greater importance as long as the reconstructed building is compatible with cultural heritage of the place [42]. Therefore, it is necessary for a reconstruction process to reflect on the relationship between invention and memory and not necessarily require recreating something exactly as it was in the past [43].

Reconstruction is also seen as a process of renovating or regenerating the social and economic conditions of an area that has been abandoned for an extended period of time. In this case, it involves an attempt to remember something in one's mind, as well as establishing one's identity once more [39]. As a result, restoring historical buildings reflects a community's social and political context. It is only the beginning of the process to ensure the reconstruction is authentic (using traditional techniques, materials, and original plans [44]. Unlike restoration, reconstruction primarily restores the functional qualities of a building without altering its appearance [38]. Reconstruction is not just a matter of restoring or repairing. In essence, it is the protection of one's own past. Nonetheless, the decision to rebuild a historically significant building is always motivated by the desire to preserve it permanently for future generations. Reconstruction in other words is a significant tool for conserving, stabilizing, and preserving the heritage for the present and the future [40].

6. Example of modern reconstruction of a Graeco-Roman period building in Egypt

Alexandria's modern Bibliotheca Alexandrina (the Great Library of Alexandria) can be considered a magnificent example of the reconstruction of one of the most prominent Graeco-Roman buildings in ancient Egyptian history. The ancient city of Alexandria was the center of science and knowledge in the ancient world. It was founded under the command of Alexander the Great when he invaded Egypt in 332 B.C. His successors, the Ptolemies, aimed to make Alexandria the center of Hellenistic culture in the ancient world. As the founder of the Ptolemaic Dynasty, Ptolemy I was planning to establish a scholarly library annexed to the Museion which would function like a scholarly academy for intellectuals and scientists [45].

In the Graeco-Roman times, the library was located in the royal headquarter of the city, where also the Museion, the great scientific edifice lay. In order to establish the Museion and the library, Ptolemy I entrusted them to Demetrius of Phaleron, who was interested in the philosophy of Aristotle and had been the ruler of Athens for about ten years until he was banished in 307 BC. In addition to being one of the earliest public libraries in the world, the Great Library of Alexandria was also the largest. It contained a large collection of books, papyri rolls, and original manuscripts collected from Egyptian temples. According to Strabo—the great Roman historian who visited Egypt at the end of the first century B.C.—it consisted of a park, a hypostyle hall, and a great construction for holding assemblies. It contained a large number of volumes and papyri rolls. The Ptolemaic rulers paid great attention to provide it with original manuscripts collected from the Egyptian temples. The library contained then between 400.000 and 700.000 papyrus rolls dealing with all fields of science. It was sadly struck by a terrible tragedy during the Alexandrian War of 48 BC. A dramatic fire destroyed it. It was restored and reconstructed in several times over history until it was completely destroyed and forgotten.

In 2002, the newly built library of Alexandria was officially opened. The project of establishing and reviving the library was supported by UNESCO. Unfortunately, the modern library is not located exactly where the ancient one was, but close to it on the shore of the Mediterranean Sea in Alexandria. The idea of revitalizing this old library dates back to 1974 when Alexandria University appointed a committee to select a plot for its newly constructed building. Construction works on the complex began in 1995, and it was inaugurated on October 16, 2002. It is built near the sea with an area of about 80.000 m^2. It is designed by a Norwegian architectural company Snohetta, whose design was selected through an anonymous international competition held in 1989. The structure has an inclined cylinder form emerging from the ground with a sun disk shape roof imitating the sun rays shining over the Mediterranean. The outer wall of the structure is covered with granite panels bearing characters and alphabets from ancient and modern languages. To play the same ancient role as a cultural and science center of excellence, the library embraces in addition to specialized libraries and archives, and it houses a number of institutes, research centers, libraries, museums, and permanent exhibitions.

In contrast to the ancient library, the modern one was not reconstructed along the same lines. In spite of its reconstruction to serve the ancient purpose of being a world intellectual and cultural center, this structure has a contemporary design that is substantially different from its ancient counterpart. Therefore, the current Bibliotheca Alexandrina is an outstanding example of the theory of how reconstruction is used primarily as a means of preserving a heritage's significance and quintessence rather

than its appearance. To put it another way, the goal here is primarily cultural rather than political in reviving the Graeco-Roman tradition.

In comparing the current reconstruction of the Graeco-Roman Bibliotheca Alexandrina with the reconstruction undertaken by the Ptolemaic and Roman emperors during the Graeco-Roman period in Egypt, it is clear that they differ in two critical aspects: Firstly, the approaches pursued, and secondly, the reconstruction's role as a means of architectural conservation. With respect to the first difference, in modern concepts, the heritage core and cultural significance (in some cases) are more valued than the appearance of a renovated historic structure. However, in the case of the reconstruction of Egyptian temples in the Graeco-Roman period, appearance played a significant role along with traditional significance. Alternatively, in the second difference, the purpose of reconstruction is largely to conserve and retrain the culture of localities. By contrast, the Ptolemaic and Roman emperors were more interested in conserving Egyptian temples built along the same lines as in Pharaonic Egypt. They also emphasized representations of deities and royal scenes out of political aspirations rather than cultural ones. In other words, they pursued a cultural approach to achieve their political goals rather than the cultural ones.

7. Conclusions

It has become apparent that reconstruction has been used for architectural conservation since the early ages in various parts of the world as a means of architectural and cultural heritage conservation, specifically during the Graeco-Roman period in Egypt. Over the course of history, reconstruction has primarily been intended to preserve cultural heritage.

However, the preservation of architectural and cultural heritage was primarily carried out to serve the political goals of the Graeco-Roman rulers. In order to preserve the architectural heritage represented in the Egyptian temples, the Ptolemaic kings and the Roman emperors adopted a conservationist approach. Their apparent goal was to pass on the Egyptian cultural and religious legacy, but their primary objective was actually quite different. The foreign rulers followed this policy in order to placate the populace and legitimize their rule by relying on the Egyptian faith.

Architectural conservation thus in the Graeco-Roman period served as political propaganda for the rulers in order to gain acceptance as legitimate successors to the Egyptian pharaohs. The strategy involved architectural restoration and reconstruction. In addition to this, the walls of the temples were painted with the same Egyptian reliefs and scenes. They were carved and decorated in the same ancient Egyptian style and with Pharaonic royal and religious themes. Consequently, they continued to formalize the legitimacy of these rulers in a way that fit the Egyptian political and religious heritage then.

There has been a long and continuing debate among heritage institutions and scholars regarding reconstruction as a means of preserving cultural heritage. This debate includes the criteria that should be incorporated into the process of reconstruction. Reconstruction, however, as an approach to conserving architectural heritage, today has totally different principles and goals than it did in ancient times, particularly the Graeco-Roman Egypt. In the modern world, the main objective is to preserve culture and history. It is aimed at revitalizing the identity and authenticity of the place by reviving its significant past. This is well illustrated by the example of the reconstruction of the Great Library of Alexandria from the Graeco-Roman period. The main

goal here is to retain the same intellectual and scientific role played by the library in Graeco-Roman times or in other words to revive the cultural glory of the city.

Thus, the answers to the questions mentioned in the introduction of the chapter about the purposes of architectural conservation in Graeco-Roman Egypt, and where the same concepts are applied today with the same goals. A small comparison between the Graeco-Roman period and modern times shows that although the approach and the concept of using reconstruction as a method of conserving architectural heritage in the two cases are quite similar, the goals on the other hand are different. In modern times, the goal focuses more on preserving culture as it pertains to history, heritage, identity, and authenticity. In the case of the Graeco-Roman period in Egypt, however, it was evidently done to preserve ancient Egyptian religious heritage to eventually achieve political goals.

Author details

Marwa Elkady[1,2]

1 Department of History, Seattle University, Seattle, Washington, U.S.A

2 Former Department of Tourist Guiding, Alexandria University, Alexandria, Egypt

*Address all correspondence to: elkady.marwa@yahoo.com

IntechOpen

References

[1] Viñas V, Viñas R. Traditional Restoration Techniques: A RAMP Study. Paris: UNESCO; 1988. p. 2

[2] Conservation of Cultural Heritage [Internet]. Available from: http://uis.unesco.org/en/glossary-term/conservation-cultural-heritage. [Accessed: January 19, 2023]

[3] Matero F. Heritage, Conservation, and Archaeology: An Introduction. AIA Site Preservation Program. Boston: Archaeological Institute of America; 2008. pp. 1-5

[4] Murtadhawi Z. Preserving the Identity of traditional buildings through conserving their passive systems. In: Conservation of Architectural Heritage. Advances in Science, Technology & Innovation. Cham: Springer; 2019. pp. 243-262

[5] Bevan E. A History of Egypt under the Ptolemaic Dynasty. New York: Routledge Taylor & Francis; 2014. pp. 1-12 32

[6] Translated H. from German by Saavedra TA History of the Ptolemaic Empire. Vol. 26. London & New Yok: Routledge; 2001. p. 111

[7] Tyldesley J. Cleopatra Last Queen of Egypt. London: Profile Books Ltd; 2009. p. 198

[8] Sales J. Political ideas expressed by visual narratives: The case of Ptolemaic Egyptian temples. Boletín de la Asociación Española de Egiptología. 2019;**28**:95-124

[9] Vandorpe K. The Ptolemaic period. In: Lloyd A, editor. A Companion to Ancient Egypt. Chechister: Blackwell Publishing Ltd; 2010. pp. 159-179. DOI: 10.1002/9781444320053.ch9

[10] Chauveau M. translated from French by Lorton DEgypt in the Age of Cleopatra: History and Society under the Ptolemies. Ithaca. London: Cornell University Press; 2000. pp. 27-28

[11] Connor A. Confiscation or Coexistence: Egyptian Temples in the Age of Augustus. Ann Arbor: University of Michigan Press; 2022. p. 6

[12] Yiftach-Firanko U. The Roman period (30 BC-AD 284). In: Kennan J, Manning JG, Yiftach-Firanko U, editors. Law and Legal Practice in Egypt from Alexander to the Arab Conquest. Cambridge: Cambridge University Press; 2014. pp. 6-9

[13] Straus JA. Slaves and slavery in the Roman period. In: Kennan J, Manning JG, Yiftach-Firanko U, editors. Law and Legal Practice in Egypt from Alexander to the Arab Conquest. Cmbridge: Cambridge University Press; 2014. pp. 452-461

[14] Bagnall Ronld S, editor. Egypt in the Byzantine World, 300-70. Cambridge: Cambridge University Press; 2007. p. 11

[15] Muhs B. The Ancient Egyptian Economy: 3000-30 BCE. Cambridge: Cambridge University Press; 2016. pp. 256-257

[16] Hirt AM. Imperial Mines and Quarries in the Roman World: Organizational Aspects 27 BC-AD 235. Oxford & New York: Oxford University Press; 2010. pp. 220-221

[17] Identity VK. In: Rigg C, editor. The Oxford Handbook of Roman Egypt. Oxford. New York: Oxford University Press; 2012. pp. 260-276

[18] Venit MS. Referencing Isis in Hellenistic and Roman Egypt. in Isis on

the Nile Egyptian gods in Hellenistic and Roman Egypt. In: Bricault L, Versluys M, editors. Proceedings of the IV International Conference of Isis Studies, Liège, November 27-29; 2008; London. Boston: Brill; 2010. pp. 80-84

[19] Marouard G. Dendera. 2015-2016 Annual Report, The Oriental Institute of the University of Chicago [Internet]. pp. 35-48. Available from: https://oi.uchicago.edu/sites/oi.uchicago.edu/files/uploads/shared/docs/ar/11-20/15-16/ar2016_Dendara.pdf. [Accessed: January 19, 2023]

[20] David R. Handbook to Life in Ancient Egypt. Revised Edition. 2nd ed. Vol. 131. Oxford. New York: Oxford University Press; 2003. p. 22

[21] Daumas F. Dendera. In: Helck W. Otto E. editors. Lexikon der Ägyptology, vol. I, Wiesbaden: Otto Harrassowitz; 1975. pp. 1060-1063

[22] Bard KA. Encyclopedia of the Archaeology of Ancient Egypt. London. New York: Routledge; 1999. p. 252

[23] Sauneron S. Esna. In: Helck W. Otto E. editors. Lexikon der Ägyptology, vol. II, Wiesbaden: Otto Harrassowitz; 1977. pp. 30-33

[24] Arnold D. Temples of the Last Pharaohs. New York: Oxford: Oxford University Press; 1999. pp. 180-181. 187-188, 191, 262

[25] Wilkinson RH. The Complete Temples of Ancient Egypt. New York: Thames & Hudson; 2000. pp. 149-150 50

[26] Wong JY. Raze of glory: Interpreting iconoclasm at Edfu and Dendera. Journal of Late Antiquity. 2016;**9**(1):89-131. DOI: 10.1353/jla.2016.0000

[27] Minas-Nerpel M. Pharaoh and Temple building in the fourth century BCE. In: McKechnie P, Cromwell J, editors. Ptolemy I Soter and the Transformation of Egypt, 404-282 BCE (Mnemosyne Supplements 415). Leiden: Brill; 2018. pp. 120-165. DOI: 10.1163/9789004367623_007

[28] Richter B. The Theology of Hathor of Dendera: Aural and Visual Scribal Techniques in the per-Wer Sanctuary. Atlanta: Lockwood Press; 2016. p. 10

[29] Ragnhild BF. Image of the World and Symbol of the Creator: On the Cosmological and Iconological Values of the Temple of Edfu. Wiesbaen: Otto Harrassowitz; 1985. p. 252

[30] Winter E. Philae. In: Helck W. Otto E. editors. Lexikon der Ägyptology, vol. IV, Wiesbaden: Otto Harrassowitz; 1982. pp. 1022-1023

[31] Report on the Safeguarding of the Philae Monuments (PDF). Paper for UNESCO by Order of the Netherlands Government [Internet]. 1960. Available from: https://unesdoc.unesco.org/ark:/48223/pf0000066319. [Accessed: November 14, 2022]

[32] Stanwick P. Portraits of the Ptolemies: Greek Kings as Egyptian Pharaohs. Austin: University of Texas Press; 2022. p. 24

[33] Rowlandson J. Town and country in Ptolemaic Egypt. In: Erskine A, editor. Companion to the Hellenistic World. Malden: Oxford: Blackwell Publishing; 2005. pp. 249-263. DOI: 10.1002/9780470996584.ch15

[34] Gill JC. Dakhleh Oasis and the Western Desert of Egypt under the Ptolemies. Oxford: Exbow Books; 2016

[35] Feilde BM. Conservation of Historic Buildings. 3rd ed. London: Routledge; 2003. pp. 3-4. DOI: 10.4324/9780080502915

[36] Riga Charter on Authenticity and Historical Reconstruction in Relationship to Cultural Heritage. ICCROM/Latvian National Commission for UNESCO/State Inspection for Heritage Protection of Latvia 2000. [Internet]. 2000. pp. 258-259. Available from: https://www.iccrom.org/sites/default/files/publications/2020-05/convern8_07_rigacharter_ing.pdf#. [Accessed: January 20, 2023]

[37] Gnezdilov DV, Kapnina EV, Martynyuk ES. The problem of preservation, restoration and reconstruction of the world architectural heritage. IOP Conf. Series: Materials Science and Engineering. 2019;**698**:1-5. DOI: 10.1088/1757-899X/698/3/033022

[38] Jokilehto J. Reconstruction in the world heritage. Rome: European Association for Architectural Education; 2013. p. 5-13

[39] Stanley-Price N. The reconstruction of ruins: Principles and practice. In: Bracker RA, editor. A Conservation: Principles, Dilemmas and Uncomfortable Truths. New York: Routledg; 2009. pp. 32-46

[40] Feilden B, Jokilehto J. Management Guidelines for World Cultural Heritage Sites. 2nd ed. Rome: ICCROM; 1998. p. 63

[41] Gissen D. The architecture reconstruction of nature. In: Allen S, McQuade M, editors. Landform Building: Architecture's New Terrain. Zurch: Lars Müller Publishers; 2011. pp. 456-465

[42] Khalaf RW. A viewpoint on the reconstruction of destroyed UNESCO cultural world heritage sites. International Journal of Heritage Studies. 2016;**23**(3):261-274. DOI: 10.1080/13527258.2016.1269239

[43] Chizzoniti D, Menicil F. Rewriting architecture: Methodological principles for architectural heritage reconstruction. In: Proceedings of ARCC Conference Repository; ARCC – EAAE 2018 International Conference Hosted by Temple University in Partnership with Jefferson University and Drexel University, May 16-19, 2018 [Internet]. 2018. Available from: https://www.arcc-journal.org/index.php/repository/article/view/527/417. [Accessed: January 21, 2023]

[44] Higueras A. Aid and reconstruction of heritage in the context of post-conflict societies. Archaeologies. 2013;**9**:91-106. DOI: 10.1007/S11759-013-9224-5

[45] Di Pasquale G. The Museum of Alexandria: Myth and model. In: Beretta M, editor. From Private to Public: Natural Collections and Museums. Cambridge: Science History Publications; 2005. pp. 1-12

Chapter 6

Digital Immersion Technology and Its Strategy in the Field of Urban and Architectural Heritage Conservation

Pan Husheng, Ping Li and Lie Zhang

Abstract

Urban and architectural heritage, an important part of tangible cultural heritage, is a treasure of humanity and spiritual supply that nourishes and sustains the vitality and cohesiveness of all peoples. With the rapid modernization of cities, the urban and architectural heritage left by our ancestors is facing the risk of irreversible destruction or permanent disappearance, so the research on the application of digital conservation of urban and architectural heritage is of importance and urgency. To this end, based on the research theme of urban and architectural heritage, with the application of digital immersion technology in the field of urban and architectural heritage conservation as a clue, and by sorting out its development status and trends, the application forms of relevant projects are analyzed and relevant ideas, and finally summarized about the four ideas and strategies of "value interpretation", "authenticity", "in situ" and "sustainability". Among them, "value interpretation" is the core of immersion technology application, "authenticity" is the fundamental source, "in situ" is the characteristic highlight, and "sustainability" is the future direction of social, economic and cultural integration, hoping to provide a possible technical approach and reference of ideas and strategies for digital conservation of urban and architectural heritage worldwide.

Keywords: urban and architectural heritage, digital immersion technology, current trends, case forms, ideas and strategies

1. Introduction

In the long evolutionary process of survival and development, human beings have left countless outstanding cultural heritages, among which urban and architectural heritage, as material carriers witnessing and recording historical cultural lineage, are important components of tangible cultural heritage. They can be divided into two major parts: urban heritage and architectural heritage. The former mainly refers to ancient relics buried underground, including settlements and architectural sites, tombs, kiln sites, traffic, etc., which can reflect the historical, artistic, cultural and

scientific values of a city; while the latter is subordinate to the former, referring to ancient artificial constructions existing on the ground, including temples, cities, bridges, and various structures, etc., which are material, immovable cultural entities. The conservation of urban and architectural heritage has long been a top research direction in this field in both academia and industry, and is also the most complex area of urban public governance, involving complex conflicts between the values and interests of plural social agents [1].

Early conservation of urban and architectural heritage manifested itself more as a broader study of the cultural heritage dimension, the origins of which can be traced back to the Enlightenment Movement in Europe. On the one hand, the aspirations of the upper classes for democracy and republicanism inspired their passion for the restoration of the architectural remains of ancient Greece and Rome; on the other hand, people believed that they could dictate the future through the power of scientific prophecy and social engineering and rational planning [2]. And the concept and practice of modern urban heritage conservation began in France after the Revolution in the 19th century, with the establishment of measures to protect the first buildings in order to restore the architectural heritage destroyed during the Revolution, which is considered to be the source of modern heritage conservation legislation. The study of urban and architectural heritage conservation in China originated in the 1930s, when architectural conservation experts, represented by Mr. Liang Sicheng, took the lead in focusing on and practicing the conservation of relevant urban heritage [3].

However, with the development of society and changes in the concept of heritage conservation, views on the conservation of urban and architectural heritage have begun to sprout that, in addition to traditional conservation measures such as restoration, rehabilitation and monitoring, many factors such as urban economy, culture, society and environment need to be considered at the same time. The principle of "authenticity" for cultural heritage conservation was introduced in the Venice Charter in 1964. However, there has been a fundamental contradiction between conservation and development in cultural heritage, mainly because some researchers believe that maintaining the "authenticity" of cultural heritage will hinder the planning and development of modern cities to a certain extent. For example, China has experienced rapid urban modernization in recent decades, but while the public has enjoyed modernization, the problem of permanent destruction of the original urban and architectural heritage has come along with it, causing irreparable loss of historical information. Therefore, in response to the practical problem of contradictions and controversies in the field of urban and architectural heritage conservation, new technical tools and interpretations are urgently needed.

In recent decades, the rapid iterative innovation of digital technology has led to a booming wave of digital conservation in the cultural heritage sector, offering new possibilities for solving these problems. Research on digital preservation of cultural heritage can be traced back to the "Memory of the World" project proposed by UNESCO in 1992. In the 1990s, with the support of 3D technology and virtual reality, the digital conservation of cultural heritage entered the 3D era. In 2009, the International Council on Monuments and Sites (ICOMOS) launched The London Charter for Computer-Based Visualization of Cultural Heritage [4], which provides an authoritative framework for the digital conservation of cultural heritage, with a landmark significance [5]. Digital conservation of cultural heritage in China began in the late 20th century. For example, the "Dunhuang Frescoes Multimedia Restoration" project of the Dunhuang Research Institute, a project that involves the salvage digital preservation of Dunhuang frescoes through 3D scanning and other technologies. In

the process, digital immersion technology (hereinafter referred to as "immersion technology") has become an increasingly important focus of research and application, mainly in the form of art, culture, technology and industry integration, resulting in a different form of art that brings many changes to social life [6]. Meanwhile, in recent years, based on the application of immersion technology, the vocabulary such as immersive experience evolved from it has been widely used in the fields of film, theater, and theme parks around the world [7]. Therefore, the study of digital immersion technology in urban and architectural site conservation has important research value and application significance.

In this regard, through reviewing the development of digital immersion technology in the field of urban and architectural heritage conservation, sorting out its advantages and analyzing representative cases, it is attempted to summarize its application forms and strategies in this paper, with the aim of providing a reference for the application forms and strategies of digital conservation of urban and architectural heritage in the global context.

2. Current trends in the application of digital immersion technology

The term "immersion" originally refers to the effect of computer technology and means, and there is no unified definition of the concept of "digital immersion technology", which is broadly understood in this paper as "a general term for a series of technologies that make it difficult for users to distinguish between real and virtual by blurring the boundaries between virtual and real environments", mainly divided into building technologies based on digital scenes of urban and architectural heritage, such as geographic information, 3D scanning, model building and heritage management, and display planning and experience design based on digital simulation scenes. Therefore, in this paper, the current trend of its development is discussed from three aspects: immersion technology, immersion experience and immersion design.

2.1 Software and hardware immersion technology: growing maturity

Currently, the categories of display forms based on immersion technology are virtual reality, augmented reality, mixed reality and the newly popular metaverse. The immersion technology mainly stimulates users with multi-sensory through relevant sensing, display and other equipment, so that the user's sense of presence and participation in the virtual environment can reach the best state. In terms of the development of its hardware and software equipment, it has been increasingly mature with broad future prospects. For example, Meta CEO Zuckerberg introduced Meta's R&D trends in head-mounted displays in the next 5-10 years: to further enhance the hardware device experience in four aspects: retinal resolution, focal depth, optical distortions, and high dynamic range (HDR), to achieve a dramatically higher experience than the current head-mounted display by 60 times. The fourth "Holocake2" is a holographic display solution to create the lightest, most immersive mixed reality device.

The situation and conditions of contemporary hardware and software immersion technologies extend to the issue of the degree of variability between the psychology and physiology of the user. Some studies have shown that human psychological and physiological responses have reached a similar level between real and virtual environments [8, 9]. Behavioral realism explains the extent to which observers respond to a

virtual environment made up of hardware and software immersion devices, just as they do to a physical environment [10]. These responses can cover a wide variety of bodily behaviors, including the way users hold or move their bodies, their performance in Kinesthetic Sense tasks, and their navigation and wayfinding decisions in space. Therefore, the use of immersion technology to create a roaming experience of urban and architectural heritage environment and real scene tour, has now reached the ability to give users a similar experience, which partially supports the increasing maturity of the current software and hardware immersion technology. Whether it is the restoration of a single building site or the whole city site, the display is more image, vivid and realistic, which is a good foundation for better protection and display of urban and architectural heritage.

2.2 Multi-sensory immersion experience: getting more realistic

The increasing maturity of immersion technology and hardware and software products experience innovation, on the one hand, greatly enhance the stability and sustainability of the operation of immersion products, on the other hand, based on this, greatly enhance the experience of immersive virtual environment, reflected in the user's feelings and the mobilization of the sense of touch, hearing, smell, so that users enjoy a more realistic multi-sensory immersion experience, allowing the display of cultural heritage more realistic and attractive.

The immersion experience was first introduced by the American psychologist Mihaly·Csikszentmihalyi [11] in 1975 and then systematically described in his book *Flow: The Psychology of Optimal Experience* in 1990: The "flow" refers to the state of total concentration and forgetfulness when we do something - a state in which one is not aware of the existence of time and feels a sense of energy and satisfaction when things are done.

The development of immersive technologies allows cities and architectural sites to go beyond data collection in research institutions, but to be presented for science and cultural dissemination to a wider audience. Digital interpretation of heritage can make the final presentation interpretive, engaging, and entertaining, interpreting heritage knowledge in a more interesting and engaging way and enhancing interaction with participants [12]. At the same time, immersion technology can recreate unreproducible cultural themes while maintaining the "authenticity" and "integrity" of heritage. Taking the "Reproduction - the Old Summer Palace" [13] project as an example, experts and scholars of the project have restored the Old Summer Palace, which was damaged in 1860 and known as the "Garden of All Gardens", based on various historical documents and site surveys, and have used immersion technology for interactive display of the virtual site on the basis of the restoration. The products currently available include augmented reality products and immersive realistic spaces, which have attracted a large number of visitors to the site. Thus, immersion technology provides a realistic multi-sensory immersion experience through the integrated use of touch, hearing and smell, allowing for a more realistic presentation of urban and architectural heritage.

2.3 Diversified immersion design: more possibilities

Immersive technologies and immersive experiences benefit from a variety of display and narrative methods, which can be called "diverse immersive design" and offer unlimited possibilities for scenario planning and visual design. For example,

Mihaly's flow experience model is known as the "three-interval model. Following his research using the Experience Sampling Method, he predicted that flow experiences are possible when the challenges people face when participating in an activity match the skills they have acquired; boredom occurs when skills are greater than the challenge, and anxiety occurs when skills are less than the challenge. Following Mihaly, the research team at the University of Milan built on its foundation to create a four interval model and an eight interval model to more precisely locate the evoked location of the flow experience. Later on, as the experimental data accumulated, more scholars such as Hoffman [14] and Novak suggested that data comparison from more dimensions would be more accurate. The VR product *Notes on Blindness: Into Darkness* [15] is a virtual reality experience based on the dictated diary of blind professor John M. Hull. Using the principles of flow generation, the work is a good balance of curiosity, interactivity, surprise, and presence, which are the key elements of flow generation. In the work, binaural audio and 3D animation effects are used to create an immersive world felt by a person who is gradually losing his sight. The work makes extensive use of ambient sound effects so that the experience can be displaced according to the sound to determine the orientation. In the work, the visual form is particularized and the auditory senses are immersed in the sensory world of the blind professor. This work won the Feature Film Award at Tribeca Film Festival and the VR Work Award at Sheffield International Documentary Film Festival.

Cultural heritage themes often involve religious, mythological and political education scenarios that are difficult to showcase in cultural heritage restoration, but diverse immersion designs can bring about unimagined possibilities. For example, the introduction of VR technology, a branch of immersion technology, into red political education is also an important initiative in the cross-application of VR technology. The practical application of immersive VR in red education resource development is analyzed through the virtual roaming and interaction design of three scenes: red architectural resource scene restoration, red education featured classroom development and grassroots featured virtual exhibition [16]. As can be seen, the immersive experience of scene restoration, interaction design and game design has greatly enhanced the application form and dissemination capability of the site, providing more possibilities for future expansion of immersive products.

In addition, the immersion industry spawned by immersion technology is growing rapidly around the world, showing a vigorous overall vitality that fills people with anticipation [17]. *Harry Potter: The Forbidden Forest*, which is themed as a Harry Potter experience in the UK, has been widely acclaimed for its strong fan base and immersive interactive experience model, making the immersive night tour experience a new growth point in the UK tourism economy as well. Meanwhile, in 2021, Dunhuang Research Institute, together with Tencent, proposed the "Digital Provider" project on the WeChat applet "Cloud Tour Dunhuang" platform [18], promoting the first public welfare NFT in the cultural and museum industry, connecting the details of the frescoes in Cave 156 of Dunhuang's Mogao Caves, "Zhang Yichao's Army Traveling" and "The Traveling of Lady Song" to users through blockchain, metaverse and other popular technologies, creating more possibilities for immersion products.

3. Case form of digital immersion technology application

Urban and architectural heritage immersion technology is mainly divided into online and offline application categories. Online immersion application is primarily

based on Web3D, 360° panoramic pictures, 2.5D staggered web display and other technologies, forming a virtual space case form of Web end roaming and 3D immersed in App, such as panoramic Forbidden City, cloud tour of Great Wall, etc. Offline immersion application form, mainly using LED screen, multi-channel projection fusion, interactive sensing equipment, virtual imaging equipment and other hardware base, and under the control of broadcast control software, creates a sensory experience with immersive audio-visual in the enclosed space in the museum. It also generally has two forms: one is the audiovisual immersion form in which the audience stands in the middle position to watch the images wrapped around them, and the other is the fantastic function of increasing the interaction between the audience and the images by adding hardware devices such as radar scanning on top of the first one. Virtual reality technology is currently a more obvious form of immersion experience application. In this paper, this will be briefly explained from the two cases of "Terracotta Warriors VR" and "Samsung Pile VR" that the author's team participated in developing, respectively.

Known as the Eighth Wonder of the World, the Emperor Qin Shi Huang's Mausoleum and Terracotta Warriors contain rich information and unique value in the field of history, culture, military, science and technology and so on, highlight the core values of Chinese civilization, and have become an epitome of Chinese history and culture [19]. The "VR Terracotta Warriors" project is a virtual interactive roaming experience based on the real 3D space of the site and the 3D restored model of the terracotta warriors, combined with archeological related historical materials such as the color of the terracotta warriors, ancient military system, ancient carriage system, ancient weapon knowledge, etc. The audience uses the knowledge learned during the site visit to perform knowledge breaking activities in the experience. In the form of a serious game combining narrative and experience, they are engaged in an immersive experience of cultural exploration of the Terracotta Warriors in a specific capacity. The audience takes a profound and fantastic journey through time and space in the alternating evolution of real and virtual, space and time. In this interactive process of exploration, the audience are actually submerged in an immersive learning journey about the history and culture of Qin Shi Huang's tomb under the intentional arrangement of the designers. The actual scenes during the game are shown in **Figures 1** and **2**.

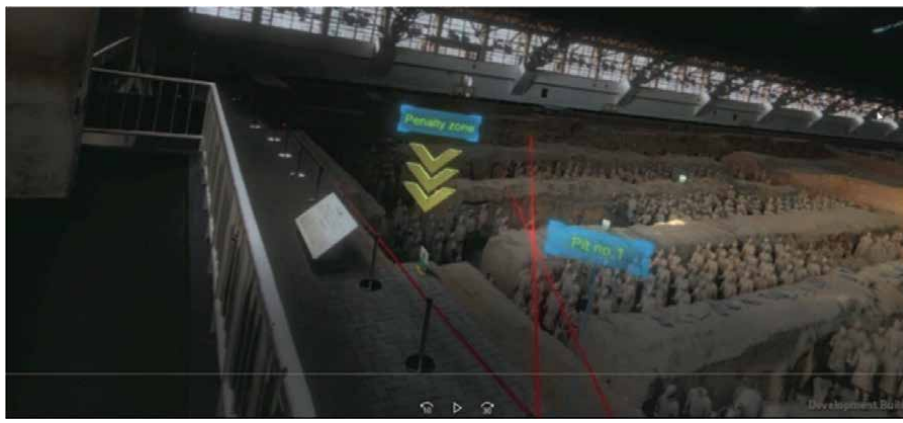


Figure 1.
Terracotta warriors site VR immersion tour.

Figure 2.
VR immersion tour into the underground world.

In addition, the case of "Sanxingdui VR" is another immersive application developed in recent years with the participation of the author's team. Sanxingdui site, as a typical city and architectural site, has a continuous development history of 4800 ~ 2600 years, having experienced the heyday from the end of primitive society to the slave society, and the stages from the dissolution of primitive society to the local state and kingdom, which could be regarded as a more hazy but also more complete early Shu messenger [20]. Through the excavation of Sanxingdui, comparing the artifacts with the documentary materials such as "The Book of the King of Shu" and ancient history and mythology, experts have sorted out the dynastic lineage of Sanxingdui civilization and also outlined the site area stretching about 1200 hectares through relics such as the West City Wall, Moon Bay Wall, Sanxingdui City Wall and Qingyuan Mountain Site. Sanxingdui VR is a newer product application of immersion technology created based on the city and architectural sites of Sanxingdui. The game increases the novelty of the audience through hearing, the guidance and use of props such as torches and force feedback gloves, enabling the audience to further explore the mysteries of knowledge contained in the ancient Shu ruins during the game of finding clues.

During the game immersion experience, the experiencer needs to observe the surrounding environment, select and explore the exit to escape, in which he/she needs to find the totem symbols to be collected in turn. Totems were an important object of worship in the religious life of the Shu people, and a large number of totem ornaments and artifacts in various forms have been excavated from the Sanxingdui site. The content design requires the use of site totems and mask patterns, to which the audience has to tell the symbols represented by the symbols during the collection process. The experiencer can only find the totem pattern to put together to trigger the level to open the ancient tomb of Sanxingdui. The material sources of the totem design are shown in **Figure 3**. The actual game effects of the immersion experience are shown in **Figures 4** and **5**.

In the interactive system design of the VR game, the innovation of using the self-made positioning torch as the main interactive prop changes the traditional interaction mode of the handle prop, using the real behavior of blowing the torch

Figure 3.
Source of material for VR immersive game art creation. Left: Sun god bird gold jewelry. Middle: Golden frog-shaped ware. Right: Bronze man mask.

Figure 4.
VR immersion game scene effect 1.

Figure 5.
VR immersion game scene effect 2.

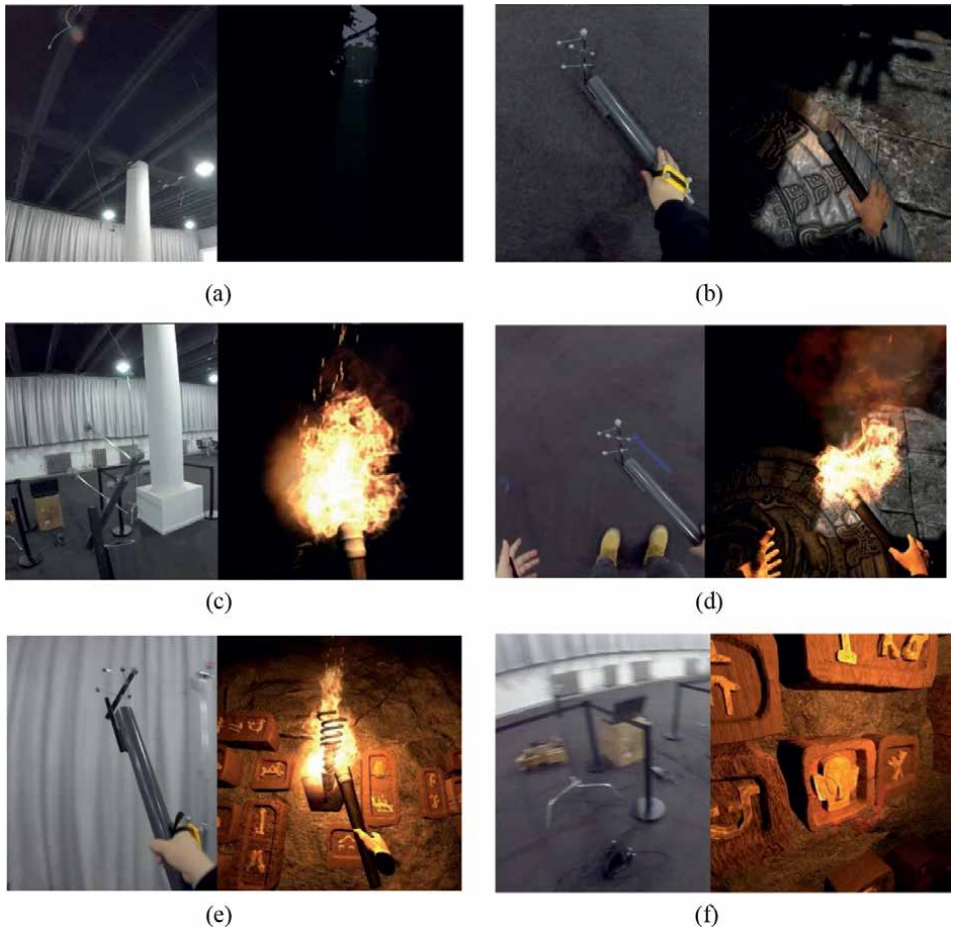


Figure 6.
Comparison chart of test environment and real environment in game immersion experience. (a) Looking up at the cave entrance to receive NPC commands. (b) Picking up falling torches. (c) Rekindling an extinguished torch by blowing. (d) Moving in space using a torch. (e) Finding other torches to light. (f) Finding the totem fragment.

and lighting other torches in the cave to promote the interactive narrative clues. Four instructions are set in the experience, such as blowing torch action instructions, lighting cave torches, searching for totem fragments, using fragments to put together the door opening mechanism, etc. If the experiencer does not execute them within 5 seconds, the system will make voice prompts corresponding to the instructions. **Figure 6** below shows the comparison between the test environment (left side) and the environment displayed on the head-mounted display (right side) during the experience.

4. Ideas and strategies for the application of digital immersion technology

In the previous section, we discussed the representative cases that can be formed by immersion technology, and combined with the long-term practice and reflection of the author's team in this field, this section focuses on a brief explanation of the

ideas and strategies for the application of immersion technology in the field of urban and architectural heritage conservation.

(1) Following the technical strategy of "value interpretation" as the core of heritage.

The issue of heritage value is often mentioned and concerned first in the field of urban and architectural heritage conservation, which has a universally recognized value division in the heritage community, with historical value, artistic value, scientific value, cultural value and social value. For the classification of heritage values, the subdivision is different in different research fields. For example, Bernard, a famous British architect, divided the values of architectural heritage into three major categories with sixteen subcategories in his book *Conservation of Historic Buildings* [21]. The first major category of emotional values contains wonder, continuity, respect and spirituality; the second major category of cultural values contains documentary, historic, archeological and age, esthetic and architectural values, townscape, landscape and ecological, technological and scientific; the third major category of use values includes functional, economic (including tourism), social (also including identity and continuity), educational, and political. Using the above categories as criteria, designers can more clearly and objectively reflect the value output they need to express or emphasize in the process of digital immersion design construction and display expression.

These values coexist in most cases, but in some scenarios or aspects, they may conflict with each other, for example, modern urban transportation construction for socio-economic development and monument preservation are sometimes conflicting sides, and some indigenous people have conflicting perceptions of native culture and foreign immigrants' perceptions of native culture, etc. [22]. Therefore, when using digital immersion technology for heritage display expression, on the one hand, efforts should be made to discover, understand and respect the diversity and unity of the specific cultural values assigned to heritage by the cultural groups to which the heritage belongs, and on the other hand, it is necessary to analyze and select the value content that needs to be expressed in priority according to the usage scenario, thematic content and communication purpose. To this end, a broad ranking of value systems can be further developed to allow designers to better understand the priorities of heritage value presentation and thus identify possible ways of coexistence between value and immersion design.

(2) Preserving the technical strategy of "authenticity" preservation of heritage.

Since the 18th century, a number of principles have evolved in the conservation of urban and built heritage interventions, such as authenticity, legibility, integrity, minimum intervention, reversibility, etc. In the *Guidelines for the Implementation of the World Heritage Convention*, it is mentioned in the assessment of heritage that "the ability to understand the value of a property depends on the trustworthiness or truthfulness of the source of information about that value. The knowledge and understanding of these sources of information relates to the original and subsequently evolving characteristics of cultural heritage and its accumulated meaning over time, which is the necessary basis for assessing its authenticity in all its aspects [23]." It is clear that "authenticity" is fundamental to the understanding of heritage values. However, in the case of the Heritage Convention, the "authenticity" of urban heritage is also full of ambiguities due to the differences in different cultural identities, so immersion technology should be designed to be compatible with the authenticity of heritage in the recording and presentation process.

In general, the design of "authenticity" for urban architectural sites needs to be integrated into the design, storage, conservation and presentation of digital

immersion from the very beginning of the planning and design process. For example, when creating a multi-source and heterogeneous database of urban heritage, it is important to prepare the groundwork for sourcing the raw data for in-depth immersion research at a later stage. In addition, digital immersion technology breaks the limitations of geographical space, but the visual design elements and manners of interactive behaviors of digital immersion products should also take full account of the cultural traditions and customary concepts they contain. For example, through the design of the interaction method that matches the theme the most, the connotation of the expressed theme and the cultural characteristics of the place are highlighted, so as to achieve the best flow experience. The general VR game experience relies on handle interaction, and the interaction form is mostly the usual game design thinking, but for the immersive experience design of tangible cities and architectural heritage, the principle of "authenticity" should be given priority. This is reflected in the "Sanxingdui VR", where the interactive prop is changed from the traditional handle to a real "torch", which is to maintain the principle of substituting the real theme.

(3) Appropriate application of technical strategies for heritage "in situ" features.

In general, the only visible remains in urban and architectural sites are the foundations of earth platforms, which can directly convey a very limited amount of information, but the sense of history and in situ nature of the site can effectively arouse deep national emotions and desire for exploration among scholars, students and viewers. It would be a good technical idea to combine the unique advantage of "in situ" emotional experience with the presentation and interpretation of multiple information of heritage, so as to present a more interpretive, engaging and entertaining effect.

For example, the author's team adopted this similar design idea at the Yingtian Gate architectural site in Luoyang, China, achieving an excellent social response. At the site of the gate building, we innovatively superimposed the site and video media to form a dream-like naked-eye immersion audio-visual effect. At this point, through the interpretation of video narratives, site knowledge can be implanted in the minds of visitors in a more receptive, visual and narrative way, allowing them to experience the historical construction techniques and the rise and fall of the Yingtian Gate in an immersive manner, so that heritage knowledge can be effectively and profoundly disseminated and create value in contemporary times.

Such creative narrative technique of artistic expression with "in situ" characteristics, which integrates projected images and site space, has a strong immersion experience, strengthens the audience's perception and feeling, ensures the artistry, vividness and interactivity in the process of conveying knowledge about the history and form of the Yingtian Gate site, and effectively connects the past with the present, and the knowledge with the audience, so that researchers or learners could efficiently access the information. This authentic case format further validates the importance and usefulness of such digital immersion technology intervention for the interpretation of urban and architectural heritage conservation.

(4) Seeking technical strategies for "sustainability" of heritage development.

Concerning the need for "sustainability" of urban and architectural heritage, the "Sustainability Guidelines" of the *London Charter* also state this. The current "sustainable" heritage development strategy is mainly reflected in two aspects: on the one hand, actively seeking the co-integration of digital immersion technology and physical buildings or sites, constituting a super-realistic audio-visual immersion of both, forming a superposition of physical heritage and immersion technology, resulting in a "1 + 1 > 2" effect, such as the above-mentioned Yingtian Gate site 3D immersion

image case. In addition, the design strategy of cities and architectural sites should not only include immersion technology, but also include the construction of immersion industry into the city construction system, so that immersion technology, heritage conservation and economic construction can develop together in a sustainable way.

On the other hand, although reconstruction cannot replace the original sites, artistic restoration of the existing heritage with respect for history has a certain sustainable development value and significance. For example, the Sui-Tang Luoyang City National Heritage Park project in Luoyang is based on the 2009 *Sui-Tang Luoyang City Site Protection Master Plan*, which calls for the preservation of the existing Sui-Tang Luoyang City sites on both sides of the Luo River. The Sui-Tang Luoyang City site has an important position in the history of the development of ancient Chinese capitals, and its layout and architectural form have had a profound influence on future generations, even influencing the architecture of East Asian countries [24]. The site overlaps with a busy part of the present-day Luoyang city district, making conservation and restoration difficult, and then through unified and coordinated reconstruction, it has now become a win-win model for heritage conservation and urban development, livelihood improvement, and cultural and tourism integration.

5. Conclusions

In summary, in this paper, based on the current development trend of digital immersion technology, a more comprehensive analysis and outlook from three dimensions of technology, experience and design are presented. Moreover, through the practical explanation and process summary of representative cases, it is not only clear about the current situation and possible innovative forms of digital immersion technology application in the field of urban and architectural heritage conservation, but also clear about the four ideas and strategies of "value interpretation", "authenticity", "in situ" and "sustainability" for digital immersion technology application in the field of urban and architectural heritage conservation. Among them, "value interpretation" is the core of immersion technology application, "authenticity" is the fundamental source, "in situ" is the characteristic highlight, and "sustainability" is the future direction of social, economic and cultural integration. In addition, the process of this research has led to several implications for the continuation of similar research in the future:

First, the application of digital immersion technology in the field of urban and architectural heritage conservation has been practiced in principle for many years and has been well received by most experts and scholars, mainly in the following aspects: through digital immersion, it is possible to preserve, record and display urban and architectural heritage in a safer, more comprehensive and flexible way without destroying the "authenticity" of the original heritage, using computer digital bite-sized storage means and simulation-based expression.

Second, the advantages of intuitive, visual, narrative and interactive experience brought by digital immersion technology are highly infectious and efficient in communication, and its vivid and imaginative immersion art techniques are conducive to revealing deeper historical and cultural veins and spiritual connotations of cities and buildings. Also, the interactive features of digital immersion technology can give the audience the feasibility of participation and interaction, allowing the audience to exert more subjective initiative, when the audience is not only the receiver of culture, but also becomes the disseminator of culture, realizing two-way benefits, thus promoting the coordinated development of urban society.

Third, in the context of "living" global heritage, the intervention of digital immersion technology and the conservation application of urban architectural sites are gradually forming an effective means of intervention, and the two have a mutually reinforcing development trajectory. The charm of digital immersion technology stimulates the vitality of traditional heritage and makes it a spiritual thread and source of strength for digital immersion technology and content extraction with its rich urban and architectural heritage. Digital immersion technology is an effective means and an innovative path to bring urban and architectural heritage closer to the present and to the world.

Fourth, in the context of the integration of culture and technology, the acquisition of knowledge and learning of planners, designers or engineers should not be limited to a single professional aspect, but rather should focus on or emphasize the integrated development of "culture, art and technology", i.e., the direction of training composite talents, so as to create more and more innovative paths for the conservation of urban and architectural heritage in the future.

Fifth, globally, as the application of digital immersion technology in the field of urban and architectural heritage is still in the initial exploration stage, a more practical and systematic methodology cannot be formed yet. However, as people subsequently practice, apply, summarize and reflect on digital immersion technology in large quantities, it is believed that the construction of related methodologies will emerge one after another, which is also the goal and scope of our subsequent research. Looking ahead, the research in this paper represents only a new exploration of digital immersion technology and heritage conservation. We expect more communication, exchange and cooperation with international related research teams to produce more research results.

Acknowledgements

This paper is an outcome of the project "Application research of interaction design in the field of cultural heritage display and communication" (no. 20BG127) supported by National Social Science Foundation of China art Project.

Author details

Pan Husheng, Ping Li and Lie Zhang*
Academy of Art and Design, Tsinghua University, Beijing, China

*Address all correspondence to: 347613327@qq.com

References

[1] Wenjing T. A Study of Urban Heritage Conservation Reporting in China from the Perspective of Public Deliberation. Shanghai: Shanghai Academy of Social Sciences Press; 2013

[2] Harvey D. translated by Yan JiaThe Postmodern Condition. Beijing: The Commercial Press; 2003

[3] Yisan R, Hongyan L. Between the True and the False: What Is True Urban Heritage Conservation. Shanghai: Tongji University Press; 2016. p. 47

[4] Denard H. A new introduction to the London charter. In: Bentkowska-Kafel A, Denard H, editors. Paradata and Transparency in Virtual Heritage. London: Routledge; 2012. pp. 57-71. DOI: 10.4324/9781315599366

[5] Li Z, Wenxuan Z, Qiu Y, Wenguang X. Research on the communication model of architectural cultural heritage based on natural interaction--Jinlian bridge as an example. Packaging Engineering. 2021;**42**(22):20-25. DOI: 10.19554/j.cnki.1001-3563.2021.22.004

[6] Zhao W, Jun J. A new path of design discipline construction in the new Liberal arts perspective-based on the generation and development of digital immersion art. Fine Arts. 2022;**07**:14-19. DOI: 10.13864/j.cnki.cn11-1311/j.006883

[7] Jing Z, Yinghua X. Aesthetic examination of immersive art in the digital age. Modern Communication (Journal of Communication University of China). 2022;**44**(7):86. DOI: 10.19997/j.cnki.xdcb.2022.07.016

[8] Browning MHEM, Saeidi-Rizi F, McAnirlin O, Yoon H, Pei Y. The role of methodological choices in the effects of experimental exposure to simulated natural landscapes on human health and cognitive performance: A systematic review. Environment and Behavior. 2020;**53**(7):687-731. DOI: 10.1177/0013916520906481

[9] Chirico A, Gaggioli A. When virtual feels real: Comparing emotional responses and presence in virtual and natural environments. Cyberpsychology, Behavior and Social Networking. 2019;**22**(3):220-226

[10] Freeman J, Avons SE, Meddis R, Pearson DE, IJsselsteijn, W. Using behavioral realism to estimate presence: A study of the utility of postural responses to motion stimuli. Presence: Teleoperators & Virtual Environments. 2000;**9**(2):149-164

[11] Chiksentmihalyi CX. Finding Flow: The Psychology of Engagement with Everyday Life. Beijing: CITIC Publishing Group; 2018

[12] Rahaman H. A Framework for Digital Heritage Interpretation. Singapore: Department of Architecture National University of Singapore; 2012

[13] Yan H, Yinghua M. Research on the theory and innovation practice of digital heritage. Chinese Cultural Heritage. 2016;**02**:4-17

[14] Hoffman DL, Novak TP. Flow online: Lessons learned and future prospects. Journal of Interactive Marketing. 2009;**23**(1):23-34. DOI: 10.1016/j.intmar.2008,10.003

[15] TRBECA: notes on blindness: into darkness. 2016. Available form: https://tribecafilm.com/films/notes-on-blindness-into-darkness-2016. [Accessed: December 23, 2022]

[16] Feng Z, Ke C. Practical application of immersive VR in the development of red education resources. Technology Wind. 2021;**12**:90-92. DOI: 10.19392/j.cnki.1671-7341.202112042

[17] Fan W. Focusing on immersive experience, constructing industry chain value: A study on the development strategy and countermeasures of China's immersive industry. Journal of Nanjing Art Institute (Art and Design). 2021;**4**:88-93

[18] Zhechao Z, Xin W. Digital communication of material and cultural heritage from the perspective of media memory—A case study of WeChat applet "cloud tour Dunhuang". News and Writing. 2021;**03**:99-102

[19] Zhang L, Qi W, Zhao K, Liang W, Tan X, Lin J. VR Games and the Dissemination of Cultural Heritage. Cham: Springer; 2018. pp. 439-451. DOI: 10.1007/978-3-319-91125-0_35

[20] Ancient Shu Kingdom. Essence of Cultural Relics Unearthed at Sanxingdui and Jinsha Sites. Li Jinzeng Yinchuan: Ningxia People's Publishing House; 2021. p. 28

[21] Feilden BM. Conservation of Historic Buildings. 3rd ed. Oxford: Architectural Press; 2003. p. viii

[22] Di L. Introduction to Protection, Restoration and Rehabilitation of Land and Architectural Heritage. Wuhan: Wuhan University Press; 2019. pp. 63-64

[23] UNESCO: The Operational Guidelines for the Implementation of the World Heritage Convention. 2021. Available from: https://whc.unesco.org/en/guidelines

[24] Official website of Luoyang Cultural Tourism Bureau: Film and Television He Tourism Administration. 2021. Available from: http://wwj.ly.gov.cn/bencandy.php?fid=88&id=471

Chapter 7

Adaptive Reuse of Historic Buildings towards a Resilient Heritage

Maya Hassan

Abstract

This chapter summarizes the development of the global principles of historic building reuse and the theories of fundamental intervention, starting from the end of the eighteenth century down to the related principles' integration into comprehensive sustainable development agendas at the beginning of this century. The chapter raised some research questions and presented three historic churches from the Syrian coast that need reuse and activation. Then, it attempted to answer the questions through a literature review and a case study of international examples of the adaptive reuse of historic churches from America and Europe in an assortment of functions. The presented case studies focused on the abandoned historic churches' original structure and materials and incorporating them into the design for the new usage, era needs and techniques, where their conservation and adaptive reuse emphasize the aging of original surfaces, walls and other components as a form of respect for the place's memory in some cases, as well as using the creative design in other cases to provide the needs of the new functions. The chapter concluded with some guidelines and essential points to be considered in the process of historic building/church' adaptive reuse in Syria and worldwide.

Keywords: historic church, adaptive reuse, authenticity, resilience, built heritage

1. Introduction

Architecture is the art of meeting human needs, which started with the early man who used rocks and caves as a refuge and shelter from the natural factors and predators that threatened his life. Since prehistoric periods, the processes of using what exists, modifying and preparing it to serve its daily needs began. The early man used a kind of architectural treatment for his cave in line with his discoveries and his desire for survival and continuity. He made a cave door to be closed and an opening to let the smoke out when he discovered the fire. The requirements and developments of human life prompted the use of a kind of functional division of his shelters, such as sleeping and residence zones. Thousands of years later, given the values of social, cultural and historical archaeological sites and buildings and their importance in shaping the identity of the country and the culture of current

and future generations, it stresses the need to reuse them in preserving them and striving for sustainable development. They are preserved for a "social purpose" with the possibility of handing over a special richness to future generations. Currently, heritage assets are referred to the inherited resources, activities or goods of the past. They are the resources for which each country has a regulatory framework designed to protect them as exemplary public goods. They contribute to giving their country vision, increasing the attractiveness and cultural tourism, which will surely generate a treasure for the nation [1]. From an economic point of view, the value of cultural heritage assets lies in the benefits that can be derived from their direct and indirect use and even from their non-use. Valorisation means benefiting more from the investment of countries, regions and municipalities in cultural heritage in several ways, thus enhancing social and economic returns. Their mere existence can contribute to business activities, employment as well as regional and urban renewal, skills development, and cultural participation of citizens. At the same time, their reuse in a suitable and non-destructive usage can provide added value [2]. Adaptive reuse is the process of modifying old or monumental buildings to make them suitable for new and non-destructive uses to allow structures to maintain their historical integrity while meeting the needs of their contemporary occupants. It continuously updates building structures that have aged beyond their original functions to meet modern requirements and changes in technology and lifestyle [3, 4]. Many research and case studies examined the effects generated by the adaptive reuse of historic buildings onto their adjacent neighbourhood and demonstrated the increase of their property prices and bringing substantial social and economic benefits as a result of heritage adaptive reuse side by side with maintaining the authenticity of the cultural heritage [5]. Several historic buildings are currently a thing of the past and need preservation. Several historic churches/buildings are demolished and abandoned as ghost buildings, and some are ineffectively reused. Our main question is: Couldn't we rethink the historic churches/buildings' design, structure, function and physical situation to be socially responsible, warm and vibrant structures in balance with their authenticity in the current era and the building material and digital revolution? The research used documentation and data collection methods based on historical and academic documents about adaptive reuse for historic buildings and churches in the first section of the research, while the second section included a case presentation and analysis of historic churches that have been reused with other functions, leading to general principles and a guiding framework for our churches adaptive reuse.

1.1 An overview of the global evolution of reuse and adaptive reuse' principles and approaches

Definitions of heritage conservation began in Europe (Italy-France-England) and later in the Americas. The most important theories of conservation and restoration appeared with the early approaches in the Italian Renaissance and during the French Revolution at the end of the eighteenth century to be embodied in international policy trends after World War II. Authenticity, original condition and materials were the main issues in the Restoration discussions. Several historic buildings were converted during the Renaissance for new uses, and in later times during the French Revolution, the use of these buildings was converted for industrial functions or military uses. The more predominant traditional approach has been to preserve the old structures as long as they continue their previous use or their function through the new use. The driving force behind "reuse" was essentially functional and financial for two reasons:

firstly, the stability of these structures, so there was no reason to destroy them, and secondly, the construction of new structures required a long time and significant financial resources. The task was not easy, and the revolution and Napoleonic rule led to a shortage of craftsmen with the skill to restore medieval buildings. Besides, the lack of sufficient documentation for these pre-war buildings and the lack of experienced architects caused the restoration; sections were renovated and remodelled rather than restored [6]. The basic intervention movements in the historical conservation of the built heritage since the mid-nineteenth century have been framed in the dualism of the Restoration and the Anti-restoration movements. Although the objectives of these two approaches are partially identical, as both are directed towards the protection of historical buildings and works of art, their methods often conflict, sometimes leading to significant conflicts. Restoration movement pioneers include Violett-le-Duc in France, Schinkel in Germany and Scott in England. The method used by the early restoration engineers was to dismantle the buildings and replace the damaged parts, leading to virtual renovations [7]. There were major modifications to the cathedrals and parts of them disappeared, which gave the restoration process the impression of destruction. The growing opposition to the prevailing practice of architectural restoration led to the emergence of the Anti-restoration movement headed by John Ruskin and William Morris calling for conservation and maintenance, and later to the opening of the Society for the protection of ancient building's Manifesto in 1877. In the Lamp of Memory, Ruskin emphasized that architecture provides memory for a nation, and the architecture of the past is an engineering inheritance of modern man that must be preserved as a living memory of the past [8]. The posterior Modern conservation movement came to bring the two trends together and to emphasize the historical, aesthetic and use values and respecting the original material based on a critical historical restoration of the artwork, which was later reflected on the international level and the Venice Charter later in 1964. Luis Regal, one of its pioneers, discussed the opposing views of the two previous movements and attributed the conflict in their theory to the different values of historical buildings. He divided these values into two categories: commemorative values and present values and suggested that the reuse of historical buildings is the most important part of the modern preservation process of architecture based on the value of architecture use.

Madrid Conference of 1904 classified the monuments into two groups: dead monuments of earlier civilizations and living monuments still in use, and recommended minimal intervention and restoration. In the 1931 Athens Charter, conservative principles rather than stylistic restoration gained international support [9, 10]. During the period of urban restoration after World War II, architects thought about preserving and reusing historic buildings. "Adaptive reuse of old buildings" became an essential topic of academic research in the second half of the twentieth century, and cultural heritage preservation grew as a global goal. They were followed by the emergence of international committees and institutions of cultural heritage concerned with the affairs of heritage and preservation (1945 UNESCO, 1946 ICOM, 1946 ICCROM). The conservation of cultural heritage grew as a global goal, and many charters were published for specific types of built heritage and museum utilization. The principles of the Venice and Bora Charters were applied, which laid the general foundations and procedures for any heritage site and building, regardless of location, culture or society. Venice Charter of 1964 established guidelines for intervention levels in conservation and restoration work. It has 16 articles for the Conservation and Restoration of Monuments and Sites based on authenticity, integrity, and original materials and documents (Articles 9,11,12,13,15,16). This charter

is still being implemented in evaluating UNESCO projects to preserve monuments and historic buildings inscribed on the World Heritage List. Venice Charter in the conservation Articles (5 and 6) concerns the monuments' reuse for socially beneficial objectives as a kind of their conservation. The modifications demanded by a change of function should not be out of the building layout or decoration, and the surrounding site and the relations of mass and colour must be preserved. It also emphasizes in Articles (2 and 10) the necessity of using sciences and technologies in conservation and restoration operations, provided that the techniques have proof of effectiveness and are tested and guaranteed by expertise [11]. The Australian ICOMOS Burra Charter (1979) encouraged an assessment of heritage property importance based on a values-based approach. The values change over time depending on the factor of the social variable itself and align with shifts in environmental, cultural, spiritual values and other use values. It defines three types of actions of built heritage conservation into Preservation, Restoration, and Reconstruction [12].

During the 1960s and 1970s, adaptive reuse was popularized in the dominant architectural language. The decline of heavy industry during the early and mid-twentieth century has left a legacy of abandoned and underutilized idle sites across the global landscape. Industrial Revolution buildings were particularly suited to adaptive reuse due to their large, open spaces and the emergence of the need for environmental treatments [13]. Due to a growing concern for the environment, increasing fuel and building materials costs and the difficulties associated with securing them, historic preservation and adaptive use become viable alternatives to new construction and building removal for urban renewal [14]. After the global energy crisis, the lack of resources and the pieces of evidence of the impact of changing climatic conditions on cultural heritage, simultaneously with the emergence of green principles, sustainability and classification systems, conservation principles and approaches began to change and the use of available technologies to adapt to the needs of this age and reduce current and future pressure on cultural and natural heritage. The integration of heritage preservation into comprehensive sustainable development agendas appeared in the Budapest Declaration of 2002 under the explicit title "the effective and sustainable conservation of the World Heritage properties" [6, 15]. Then, it was followed by other calls of UNESCO in 2007, 2010, 2011 and 2012 to integrate sustainability principles into heritage and authenticity preservation and develop strategies for built heritage as important assets for sustainable social and economic development, which was officially adopted at the twentieth session of the General Assembly of the States Parties to the World Heritage Convention in 2015 to harness the potential of World Heritage properties and heritage, in general, to contribute to sustainable development [16]. Since 2019, with the outbreak of the Coronavirus epidemic, the increase in office vacancy rates in many urban centres around the world and the spread of quarantine, work and remote communication, some trends have emerged to transform the use of office space into livable residential units, especially in capitals and major cities, which reinforces the need to think about transforming Usage down to a flexible heritage and adapted to the conditions of this era [17].

1.2 Adaptive reuse of historic churches

From the end of the nineteenth century, churches from all around the United States started adaptively reusing for a community development outcome due to the churches' deteriorating and the declining number of their parishioners [18]. The historic religious buildings were known as "white elephant buildings" in the preservation

and real estate industries due to the high cost of basic repairs and maintenance of this kind of property. They are well-known landmarks, have a significant community location configuration, and are strongly linked with their neighbourhood and its physical and social situation, well-being and health, and structure deterioration [19]. The study of Simons and Choi explained the existence of a total of 210 successful adaptive reuse cases of America's religious buildings and schools by 2010. The mentioned buildings were classified into the following categories: 52 Residential Condo' buildings, 22 apartment buildings, 43 Retail buildings, 26 Office buildings, 42 Cultural buildings, 24 Schools and one Industrial building [20]. This phenomenon is widely distributed in the USA and Europe. A survey conducted in the Netherlands by Benjamin Garstka about the suitable function for the churches' adaptation demonstrated the significance of place identity and using caution in reusing buildings of social and emotional significance. The cafés, kindergartens and private apartments were the most acceptable functions, and clubs, mosques and supermarkets were the least desirable. More than two-thirds of responders demonstrated the harm of the external changes of the churches to the local landscape, while they did not mind the internal modifications of the churches in this study [21, 22].

Towards the second half of the 1980s, new cultural orientations led to new designs or even interventions of modernization or enlargement and certain measures towards an intervention not limited to restoration and installation, but to creative intervention from the present, either by neutralizing the original space by recreating it, or by inserting elements of contrast with the building, which in any case establishes a dialogue between architectures of the past and current [23]. A sample of 100 churches along the Italian peninsula recognised four usage groups and six strategies for functional conversion of the churches. The four usage groups in this study cover non-Christian religious uses, non-cultural functions mainly in the minor buildings (official, residential, retail, entertaining functions, etc.), light cultural functions especially in the edifices (museums, auditorium, open theatres, multiple use spaces, artists' workshops, etc.) and heavy cultural functions (theatres, cinemas, multimedia centres and libraries). The strategies were reorganizing the furniture; creating temporary adaptations; conservation work escorted by new furniture; installing technological utilities and elements; inserting new functional architectural shapes; and the deep transformation of the buildings [24]. Where the adaptive reuse of churches is perhaps the most difficult type of adaptive reuse that exists, therefore, creativity plays an essential role in reusing and choosing the proper function. It is internationally recognized that historic buildings should be used for their original historic purpose with a minimal change to their architecture, site and environment for a new use. Reusing the churches first faces design obstacles due to the specific plan type, the original interior and exterior architectural features, ceiling, wall thickness, windows, materials and techniques, etc. In addition to the stringent preservation requirements of the listed historic buildings, the cost of rehabilitating, lack of funding and interest, evoking the regulations, developer challenges and declining neighbourhood economies and social fabric in many cases [25]. The enormous stock of abandoned historical churches in Western countries enabled reuse to promote their historical continuity, sustainability, and socio-cultural connectivity. It provides learned lessons and successful experiences.

1.3 An overview of the case study buildings

The three targeted historic churches for this study were headquarters of the Knights Templar on the Syrian coast in the twelfth and thirteenth centuries. The main

purpose of building them was military, defensive and religious purposes. They served a twelfth-century pilgrimage route. In the 1990s, they are registered as a national heritage with the decision of the Ministry of Culture. These ancient structures currently do not exist individually but within the framework of a city with a distinct texture and a great diversity in the styles of its buildings. The loss of active and functional communication between the building and the surrounding environment characterizes them. They suffer from the lack of restoration funding as most Syrian historic buildings. Although the economic objective of the building is considered one of the partial objectives and not one of the main objectives for employing the building, the non-destructive investment of these historic buildings and making them of economic benefit provides an appropriate return that covers the costs of restoring these buildings and helps to raise the level of maintenance. Revitalizing these buildings also achieves social goals by creating a kind of public sympathy between the building and the local people and users and achieving a kind of archaeological awareness of the antiquities and preserving them. The three selected buildings are as follows:

1.3.1 Chastel Blanc in Safita in Syria

The first building is located in Safita city in Tartous governorate in Syria. It is a tower at Chastel Blanc (Burg Safita), a small mountain crusader fort. The tower is located at the higher central point of the walled castle, where the adjacent houses cover a large part of the features of its defensive walls, as shown in **Figure 1**, [27, 28]. The tower served as both a chapel and a fortress. It is built of white limestone with 3 metres thick. It has a rectangular shape (31 m x18m, and 27 m height). Its structure base dates back to the Phoenician period; it consists of an underground floor with a semi-circular vaulted ceiling with gates leading to catacombs and a covered water cistern carved into the rock, where the water cistern and a former weapons cache were essential elements in case of siege. The cistern was filled in when the residents began building their homes. The tower chapel on the ground floor is still used today as a church for Christians. It has a barrel-vaulted roof and has been called the Church of St. Michael since 1652, in which religious rites are currently being practiced in Safita. The first floor is reached by a staircase within the thickness of the massive walls (3 meters) and leads to an open hall with windows called the Great Hall (possibly the knights' dormitory) [29, 30]. It was built on three pillars of huge protruding columns, on which are strongly curved cross-shaped stone arches. The gothic hall is currently open for visitors but not used. The flat roof is reached by a staircase and edged with simple merlons with arrow slits overlooking the distant horizon. The castle had restored in 1170 and 1202 AD after the big damage from the earthquakes. The tower remained in good condition until the end of the nineteenth century. Efforts were made to restore the tower during the French Mandate, and intensive repairs were undertaken in 1946 to protect the castle from collapse. The tower still needs restoration, and the underground and first floor need to reuse.

1.3.2 The churches of the old city of Tartous in Syria (The Crusader Tortosa churches)

Tortosa, currently called the old city of Tartous, was used by the Knights Templar as a military headquarters and a keep from 1105 (the capture by Raymond of Saint-Gilles) until it fell in1291. During that period, they built the castle with its facilities, such as a chapel, great hall and fortification surrounded by thick double concentric walls, as shown in **Figure 2**, a. Tortosa was the last outpost of the Templars on the

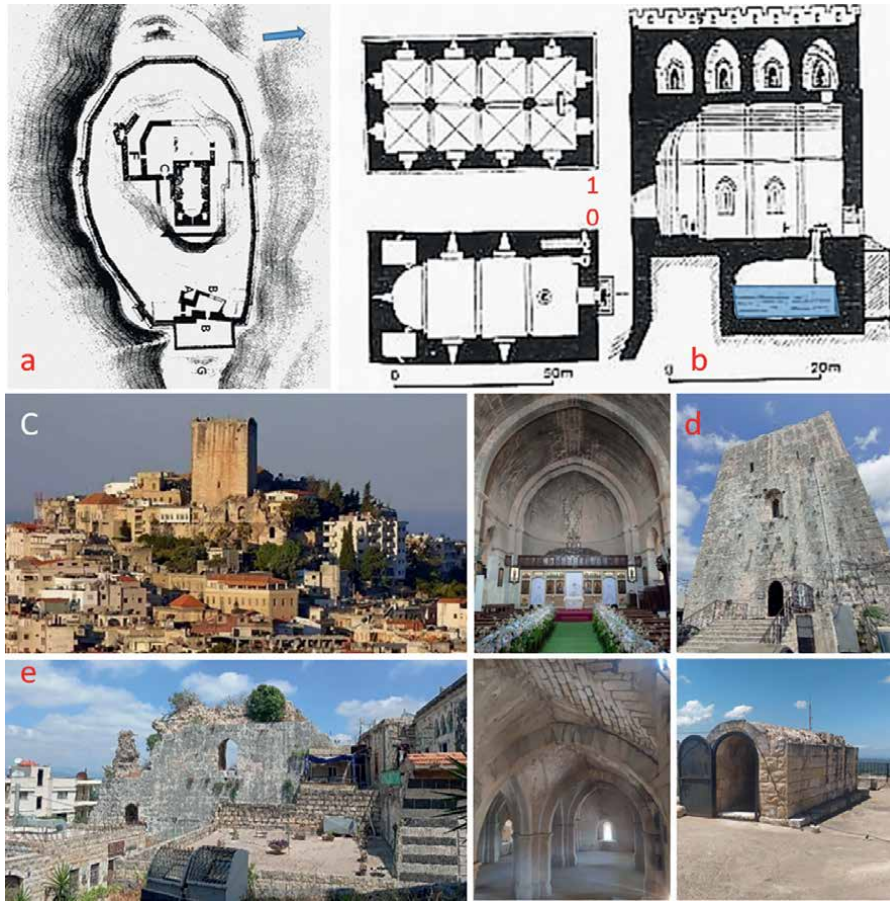


Figure 1.
Chastel Blanc in Safita in Syria: (a) The fort site plan, (b) The tower plan and section, (c) Site view, (d) The church on the ground floor and the west façade, (e) fort gate remains and photos of the templer hall and the roof. Source: Author, (a, b): [26].

Syrian mainland. Tortosa bishopric consisted of the castle and the Cathedral of Our Lady of Tortosa within the third historic wall, as shown in **Figure 2**,c. [26, 29]. In contrast to the Chastel blanc design, the knight's hall in Tortosa was separated from the chapel in a two-storey large rectangular building in the inner circle of the city walls. Tartous castle's chapel (Tortosa chapel), the second selected case study, is built nearby the hall in a typically rectangular building without an apse and covered with four gothic ribbed vaults. The houses currently overlap with the chapel wall under two western vaults, and the chapel roof is mainly destructive, as shown in **Figure 2**, d. The abandoned chapel forms a dangerous space for the local kids because they always gather and play there, and it is always filled with rubbish and waste bags. It needs structural strengthening, a complete restoration and reusing with a function that adapts to the current surrounding fabric of the old city, where most of its occupants profess the Islamic religion.

The third selected building is the semi-fortified Cathedral of Our Lady of Tortosa. It was built in 1123 by Crusaders over a Byzantine church that was popular with pilgrims. According to legend, it was an early Christian monastery dedicated to Saint

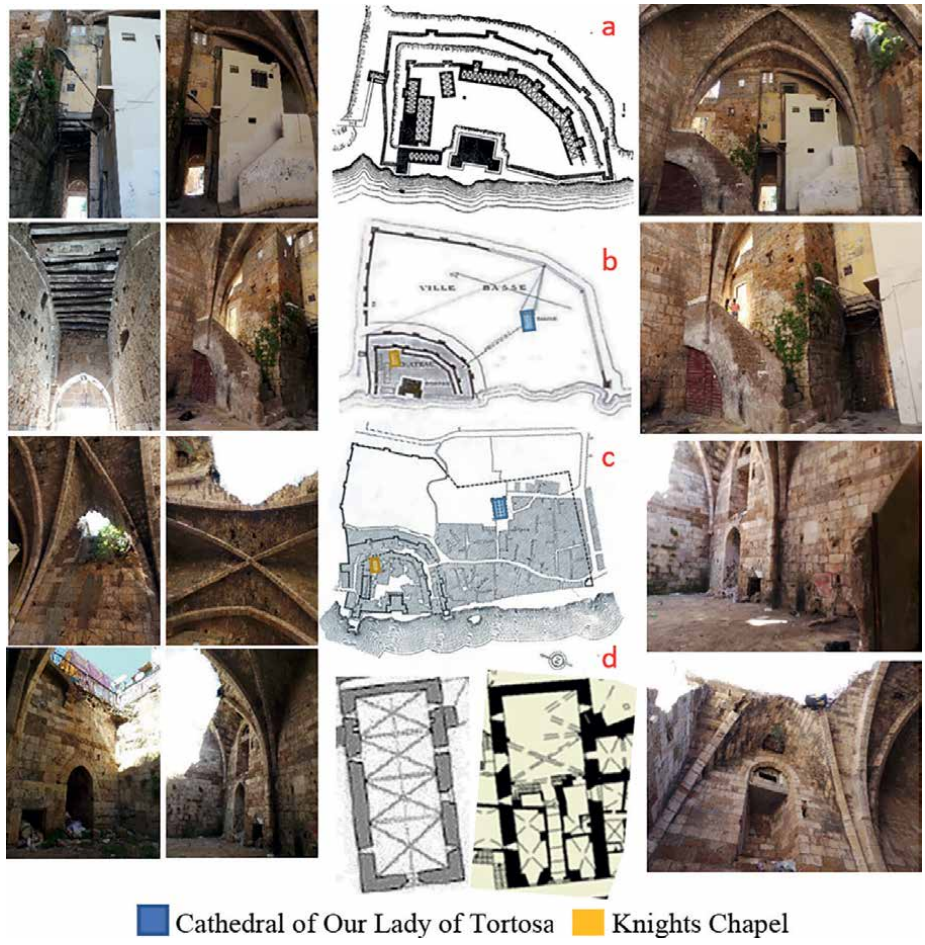


Figure 2.
Knights chapel: (a) Tartous walled Castel, (b) the inner and outer castle' walls in 1180 AD, (c) Tortosa bishopric within the third historic wall, (d) Tortosa knights' chapel before and after the residents' houses. Source: Author& [6, 26, 31]. Cathedral of Our Lady of Tortosa. Knights Chapel.

Mary and consecrated by the holy apostle Peter himself. The Cathedral was used as a mosque after the Muslim reconquest of the city, where the minaret on the west facade still bears witness until today. In Ottoman times, it became a horse stable and a barracks. The building was renovated under the French and is now the National Museum of Tartous, containing antiquities recovered from Amrit and many other sites in the region [32]. The cathedral plan is a typical basilica (41 m x 34.5 m x15m) related to the Romanesque style with the Gothic influence in the western facade presented by the five-pointed arched windows set in recessed shape in the wall, as shown in **Figure 3**. The museum was closed during the Syrian war from 2013 to 2018, and the relics were protected in a safe place. Since 2018, the museum has alternated between opening and closing for visitors due to COVID-19 lockdown in 2020 and the later interior restoration and maintenance of the capitals of the internal columns of the Cathedral. On the occasion of the Dormition of the Blessed Virgin Mary in August 2022, the Al-Mahaba Choir and the artist Ghassan Saliba held a performance concert at the Tartous National Museum (the oldest Cathedral dedicated to Our Lady)

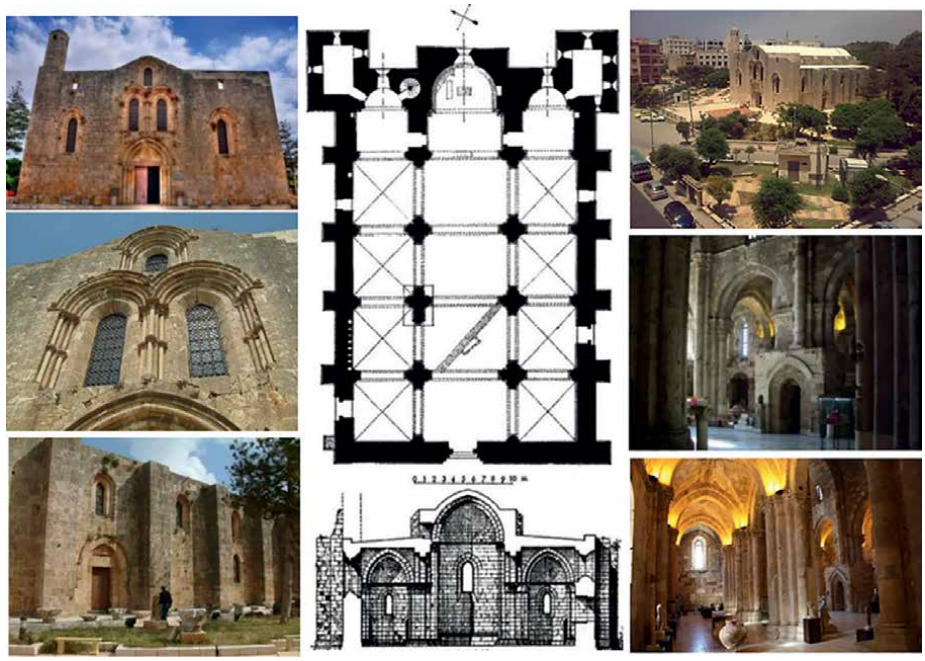


Figure 3.
Cathedral of Our Lady of Tortosa: Plan, section, and photos of the exterior and interior. Source: Author & [26].

organized by Akkar Archdiocese and the Greek Orthodox Archdiocese of Tartous and sponsored by Banque Bemo Saudi Fransi and Ahli Trust Bank. This event received a positive response and admiration from the residents of Tartous. The antiquities and Museums Department in Tartous has a proposal for an alternative location to build a museum in Tartous in the next 10 years, and all the exhibits and collections will transfer to the new building. Therefore, an adaptive utilization should be prepared for the Cathedral.

2. Global examples of adaptive reuse of historic churches

2.1 Santa Maria Church of Vilanova de la Barca in Lleida, Spain

The original church floor plan is a single-nave basilica-style church with a false transept and rectangular apse of medieval origin built of local stone. It is 22 meters long and 7 meters wide, and its interior rises up to 10 meters. The church was not built in one batch; different parts were added over time. A side nave and an entrance from the Baroque period were added to the church. The eastern part still contains side buttresses and a late Gothic cross vault from the seventeenth century at the head. The new additions to the historic church consist mainly of the completion of the damaged stone wall of white bricks and a tiled gable roof supported by thin steel trusses covering the nave. Originally, the main entrance was in the western façade of the church out to the old front square. Currently, the western entrance is replaced by a glass opening, and the building faces the east by a wooden door of the old church, and an external side door leads to the main entrance in the southern façade, as shown

Figure 4.
Santa Maria Church of Vilanova: (a) The new eastern entrance, (b) The wooden door in the eastern façade after the intervention, (c) The west facade after the intervention, (D-D) View of the interior wall after the intervention, (E-E) View of the interior arches in contrast to the intervention. The rest of photos are for lighting, materials, and roof during and after the intervention. Source: [33, 34].

in **Figure 4**. The intervention aims to achieve consolidate the elements in ruin to restore the original space of the church, simultaneously differentiating the original and added building materials, in order to reuse it as a multipurpose space. Recovering the origin volume and avoiding the mimetic reconstructions were achieved using a mediating element to achieve the main objective. The use of openwork and painted white brick cladding together with the metal trusses of the roof contrasts with the existing original remained structure in the interior. On the other hand, the new skin promotes the exchange of air with the exterior. It ventilates the building in order to avoid humidity, in addition, to its potential as an acoustic control element. Two types of lighting were used in this building; firstly, natural light penetrates the interior

through the pores of the new facings, where the light filters in, and the views are hidden for privacy. Secondly, the artificial light suspended from the ceiling covers the monumental height space at a more human height to create a sacred and collected space and an artistic installation within the primary space. The pendant lighting consists of mere wires, sockets and LEDs in a carefully thought-out arrangement of simple elements [33–35].

2.2 Selexyz Dominicanen Church of Maastricht in the Netherlands

The Selexyz Dominicanen Gothic-style Church in Maastricht was built in 1294. It was used for different functions since the Dominicans were ousted at the end of the eighteenth century started with a military depot, a school, the city depot, an exhibition space, a celebration hall, a multicultural space, a postal service, the city library, and bicycle storage. Then, it suffered poor conditions in the 1990s until 2000 when its restoration was started to be opened as a bookshop in 2006. The previous community function of the church before the restoration was one of the justifications for the proposed retail purposes use. The proposal of converting the church into a retail function was because of the new master plan for Maastricht city centre, where the church was a part of the rehabilitation project of the shopping centre Entre-Deux in 2000 [4]. The available church floor space was only half of the commercial space required, and as the church is a unique and grand monument with a strong space and vaults, it needed to be kept as open and visible as possible. Therefore, a two-storey volume of asymmetrical height was introduced into the church. A steel bookcase structure was designed on two floors to the nave side to provide extra space for books, and perforated steel sheets were used to increase the transparency. Where the volume from the ground floor emphasizes the monumental dimensions of the church while from the upper floor the visitor can see all the architectural details close up, as shown in **Figure 5**. The steel construction stands alongside the row of columns. It never covers the wall or touches the church, and it contains a series of stairs and one elevator inside its structure. All interventions are structurally reversible except the excavation of the cellar. The technical installations, storage and restrooms were hidden from sight in the existing basement. A proper lighting system was added. The lighting plan highlighted the books for sale, focused on the architectural beauty of the church and avoided visual pollution by integrating most of the lighting equipment and fixtures into the furniture or storage unit [4, 37]. According to a comparative and analytic study of Bie Plevoets, the Selexyz Dominicanen church is an outstanding case of retail reuse on the architectural, retail design, and conservation level and in urban regeneration. All stakeholders strived for a qualitative result and scientific restoration of the church [4].

2.3 St. Vincent de Paul Church of Brooklyn in New York in the U.S

According to Manhattan's Department of Buildings, in 2013, half the total of permits was for conversion; therefore, adaptive reuse was speedier due to the extremely scarce land and the existence of numerous historic districts making new construction hard [38]. The developers and real estate brokers converted several unlivable buildings such as warehouses, power plants and parking garages, churches, schools, cinemas and banks. Our selected example is the St. Vincent de Paul campus in Brooklyn, New York. The original campus contains a church, a school and a rectory. The church was founded in 1860 and closed in 2004 due to its deteriorating and declining number

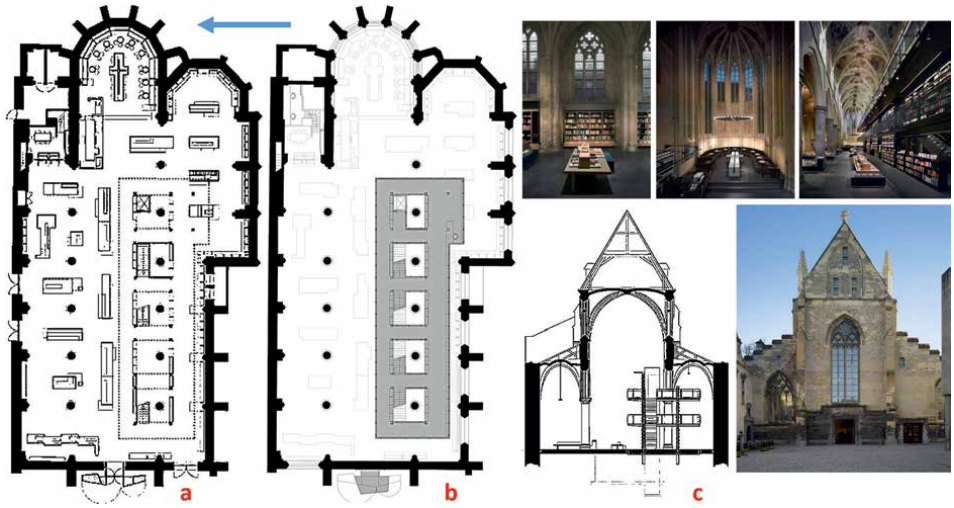


Figure 5.
The Selexyz Dominicanen Church in Maastricht: (a) The ground floor, (b) The first floor after the interior design, (c) cross section shows the bookcase structure and some interior and exterior of the church. Source: [36].

of parishioners. In 1985, the school attached to the church was merged with Our Lady Mt. Carmel and renamed Northside Catholic, and then, this school closed in 2009 [39]. In 2011, Bishop Nicholas DiMarzio issued a decree stating that the parish of Our Lady of Mount Carmel could no longer afford to maintain the church and issued the ability to sell the church could be sold for profane use except for sordid purposes such as a bar or liquor-serving restaurant [40]. The church was later sold, and the patrimony was removed in 2012. In 2011, before turning the building over to the developer, the Brooklyn Diocese removed a 130-year-old of two-ton bronze historic bell, which is blessed by Brooklyn's first Catholic bishop, as well as other artefacts, Catholic relics, stained glass windows and an altar from the vacant St. Vincent De Paul Church. Where the religious objects will remain in the Diocese's East New York warehouse until other parishes claim them in Brooklyn and Queens for use. The sight of removing the bell from the tower unnerved the neighbours and the emotion of the previous church visitors and its school students [41]. In 2014, the campus was converted into a residential usage called the "Spire Lofts" includes 104 Multi Family Residential Units [42].

The foundations have been strengthened. The Church and Rectory buildings have been restored, keeping their original architectural components, basic exterior elements and character, interior details, and the aesthetic of restored wooden old beams, arched windows, stained glass, and exposed brick. The church was designed to have a long nave with rows of columns supporting balconies on either side. The church is converted into a 5-storey building containing 40 housing units while maintaining the building as part of the historic design. To maximize the space and the number of units within the church's structural shell and interior timber truss system, the apartments were designed as duplex spaces. This allowed scenic double-height volumes and extra spaces. The central aisle is repeated on each floor and connects the two separated wings. Recessed balconies, with angled floor-to-ceiling glass doors, allowed for the required natural light and air requirements while creating unique balcony spaces. Material selections and palette remain neutral, while new elements

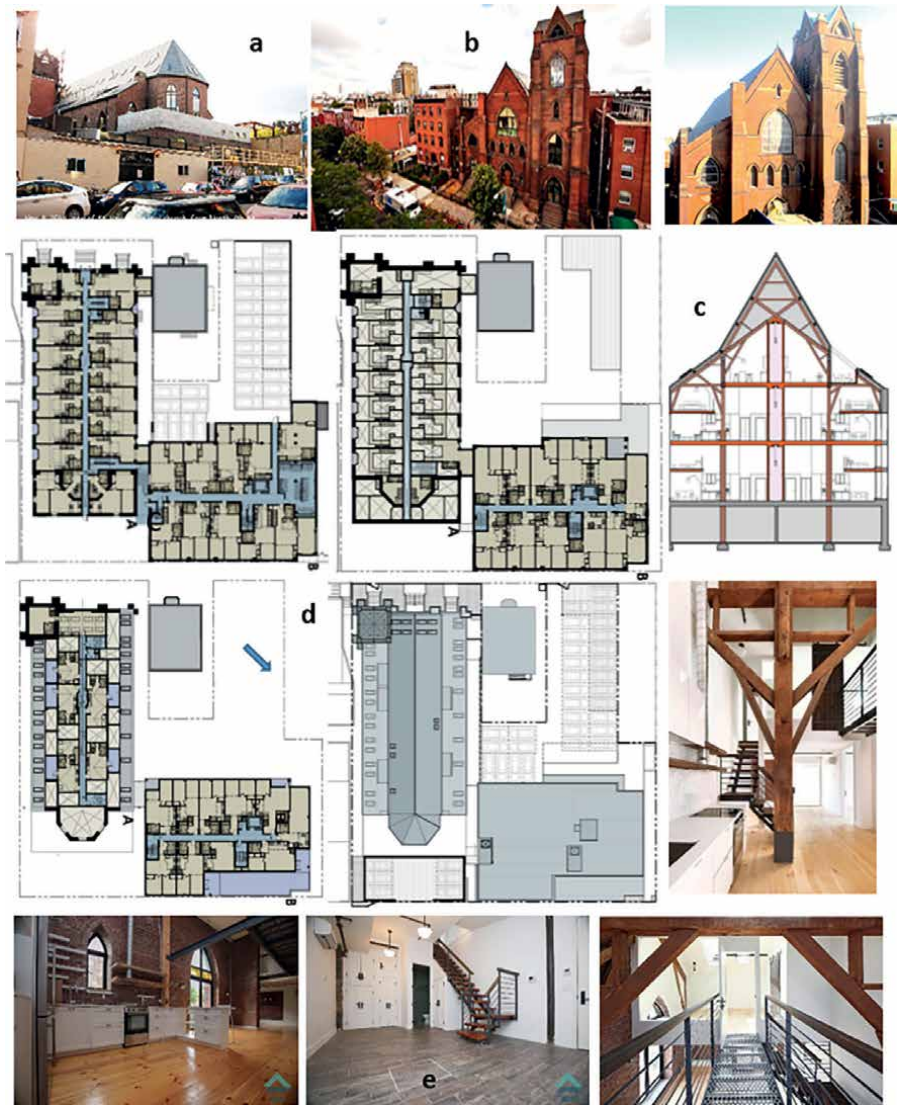


Figure 6.
St. Vincent de Paul campus: (a) The church back facade, (b) the church front façade with the bell tower, (c) section on the church after adaptive reuse, (d) the campus plan after conversion, (e) the mixture of the new and old materials of the internal converted spaces. Source: [42, 43].

for mezzanines, bridges and balconies introduced an industrial look to its interior. The church ceiling' exposed beams extend through some living spaces to remind the tenants of the historic character of their new living spaces. The church's disrepair bell tower, the roof that is riddled with holes, and the missing bricks and shingles are also restored. The original two-storey school was extended vertically to contain five stories in accordance with zoning and building code to have more space for the proposed interventions, where its zoning permits residential development up to 50 feet tall (about 15 m) [42], as shown in **Figure 6**. Although living in a church is taboo for some people, it is a challenge for others. Several structures of old vacant churches were

converted into modern houses by some architects after solving the problem of the building's possession and ownership. The Dutch Reformed Evangelism Building in the Netherlands by Leijh Kappelhoff Seckel van den Dobbelsteen architecten, London's Westbourne Grove Church by DOS Architects, Anglican church in Melbourne by Bagnato Architects, Luke Chapel in Bern in Switzerland by Morscher Architekten, James Spicer Memorial Church Hall School in London by Gianna Camilotti Interiors are related examples, where mostly the exterior may remain the roofs, arches and traditional shape for the facades and the openings, while the interior features are changed according to the space needs in the new design and with modern furnishings.

2.4 Santa Barbara Church of Llanera in Asturias region in Spain

The church was built in 1912 for the workers' community of the explosives company. After the Spanish Civil War and the company's closing, the workers' families of the old colony emigrated to other cities, leaving the place uninhabited. The old colony buildings were demolished, except for the Santa Barbara church, by a private company in the 1960s to use as an industrial estate. The church remained abandoned until 2007 and faced neglect and deterioration after years of abandonment. The church was sold to a commercial agent to build a multiservice company (Ernesto Fernández Rey), and then he decided to use the place for his skateboarding hobby. The Church Brigade collective, who was the agent belonged to, went on after his death to transform the church into a skate park called Kaos Temple with support from online fundraising and some commercial brands. The new additions were mainly the Skate ramps. They were designed and installed in the middle nave of the church, and the space was converted to serve the new usage. Okuda San Miguel was a Spanish street artist who was later commissioned to paint the church's interior vaulted walls and ceilings, which was inaugurated in 2015, with geometric figures and colours. The rainbow colours covered the interior surfaces, and the tall windows illuminated the space to give a vibrant atmosphere, as shown in **Figure 7**. This church was not the only one which transformed into a skate park. Churches in the United States were also transformed into indoor skate spaces. Such as the Saint Liborius church in St. Louis, Missouri,

Figure 7.
Santa Barbara Church, before and after, source: [44].

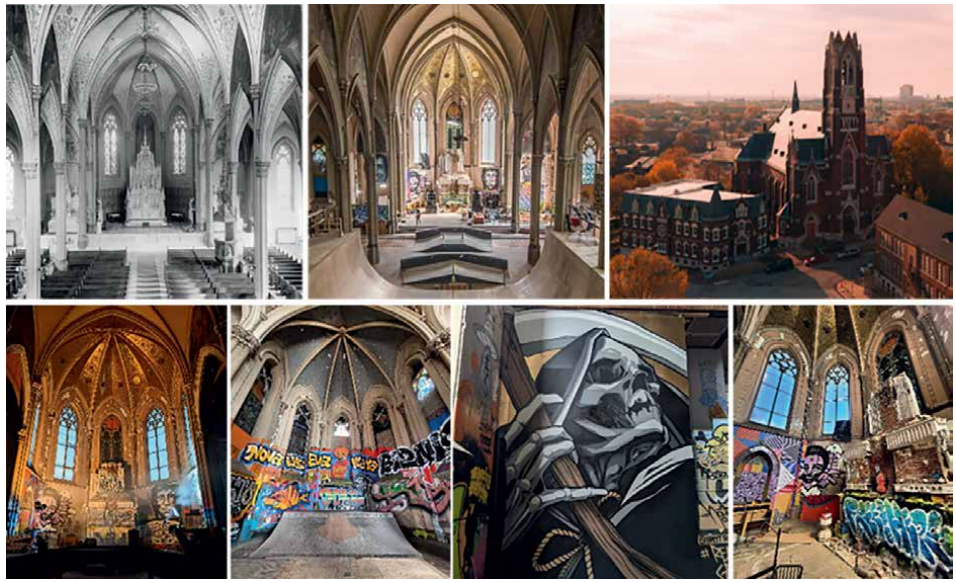


Figure 8.
Saint Liborius Catholic Church before and after, source: [45–47].

in the Midwestern region of the United States, was founded in 1889 for a wave of German immigrants who had arrived in St. Louis. and it was closed in 1992 after the declining Catholic population alongside the population in the city in general. Then in 2012, it reopened as a skate park (Sk8 Liborius) and community centre to serve its neighbourhood and district differently. The noticeable difference was in the wall paintings treatment after changing function. The drawings of the St. Louis skate park were random, disorganized and drawn by amateurs [45], as shown in **Figure 8**.

2.5 St. Mary's Church of Dublin in Ireland

The St Mary's Church in Dublin was built between 1700 and 1704. It faced a continued decay after it was closed in 1986 due to the decline of its Church of Ireland parishioners. The church was used for various purposes after deconsecration until purchased by a publican in 1997. Then, the building was refurbished as a pub and restaurant named the "John M. Keating Bar", and the pub changed its name to be called "The Church" in 2007. Currently, it serves as a cafe, bar, restaurant, and night-club. As shown in **Figure 9**, the white area (the nave) on the ground floor currently includes a large oval bar and two tiers of balconies overlooking the main floor, where the hatched area is the gallery on the first floor, and the red points are the walking route. The exterior spiral glazed stair tower built to the northeast, linked with a glass-enclosed bridge, leads to the restaurant at the upper level within the church and leads down to the burial crypts of the church [48, 50–52]. The church crypts were the only original basement of the original building, and the current Cellar, Kitchen and Tower were dug out of the foundations during the renovations. Records show that burials were in the Church Crypts. All of the contents of the crypts in this church were exhumed, and cremated and the ashes were re-interred in the Crypts of St Michan's Church, Church Street, Dublin 7 [53]. St Mary's Churchyard on the south side of the church was a burial place for a number of notable individuals. The graveyard had

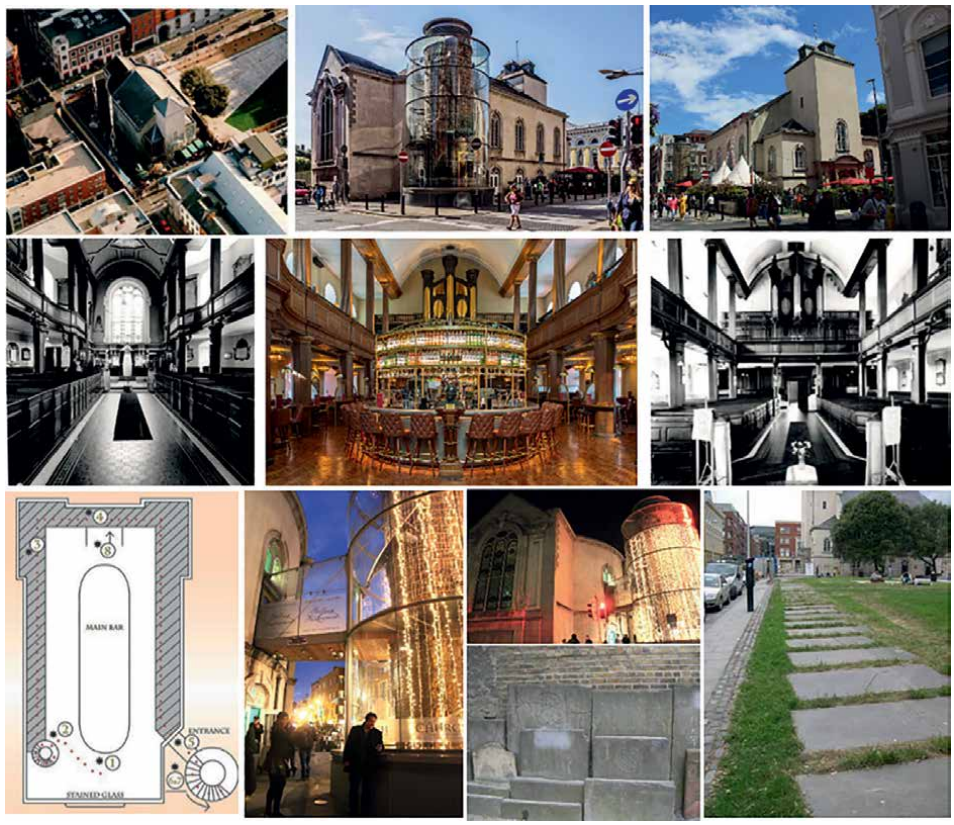


Figure 9.
St. Mary's Church of Dublin in Ireland the exterior, interior and the gravestones and churchyard, source: [48, 49].

become so overcrowded by the mid-nineteenth-century that bodies were removed in order to make more room—to the outrage of the locals. The old railings have been destroyed with the modern open urban spaces works [54]. The churchyard was converted into Wolfe Tone Park by the 1940s. The old gravestones in the churchyard have been stacked up at the southern end or removed, and a number of them laid out flat in the manner of paving stones and open for walking on in a disrespectful way to the dead and affected the inscriptions and their records [48, 55].

Several other examples were used as a nightclub, bars, and restaurants, such as Taft's Ale House in Cincinnati, Ohio (built-in 1850, a church until 2011, and a brew-pub since 2015)- The Church Nightclub in Denver in Colorado (built-in 1889, a church until 1975, and nightclub since 1996, one of the top 3 Nightclubs in Denver)- Pitcher & Piano in Nottingham in England (built-in 1876, a church until 1982, and bar, restaurant, and piano since 1998)- Vessel Nola in New Orleans in Louisiana (built-in 1914, a church until 1977, and a restaurant and bar since 2016, and distinguished by Architectural Digest as one of the eight Gorgeous Restaurants in Former Churches Worldwide in 2018)- The Church Brew Works in Pittsburgh in Pennsylvania (was built-in 1902, a church until 1993, a brewery and for the Brew Works since 1996, and classified by the Pittsburgh Magazine as one of the best breweries in Pittsburgh in 2012) [56–60]. No significant changes for the outside, the churches look like any other nineteenth Century church in the same city, as an initial impression. The interior

decors do not suggest that it is a former place of worship, and later some original features remind the seated visitor of the original purpose of the space, such as the churches' porches and arches, original stonework, and preserved stained glass. Although preserving the original structure and including a number of repainted pieces of furniture, the interiors have strikingly changed due to the churches' refurbishments. The central nave has been used as a bar or big dance stage, with seating circling over the floors with an acoustic treatment suitable for the high ceilings.

2.6 Saint Francesco Church of Santpedor in Barcelona Spain

The Sant Francesco complex was built in the eighteenth century. It was sacked in 1835, and its structure's progressive deterioration began and ended with its demolition in 2000. Only the church remained standing, but in a destructive state. With the aim to adapt the church to reuse as a cultural facility, auditorium and historical archive on the upper floors, the rehabilitation project was started in 2005. The design is characterised by contemporary predominance by using additions and interposed contrasted volume in a juxtaposition way. Besides preserving and focusing on the original deteriorated structure without any deleting, the intervention used new elements side by side with the old fabric and the partially collapsed roof [61], as shown in **Figure 10**. External glazed stairs climbing the ancient walls of this church were added as an entrance leading to the central nave. A new roof overlaps with the old damaged vaulted ceiling and shelters it. The

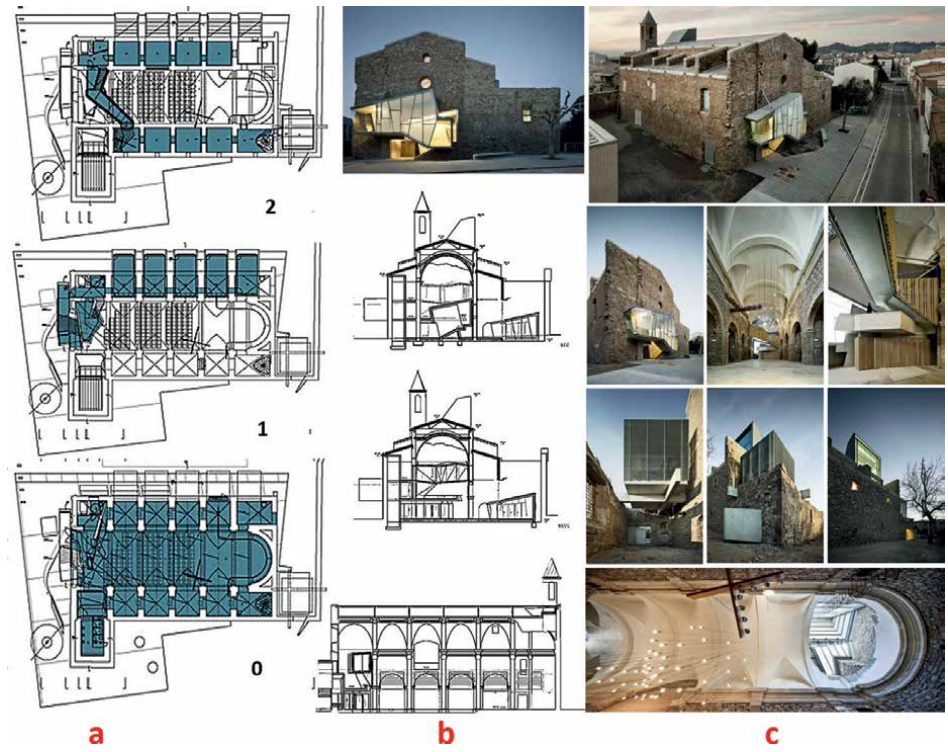


Figure 10.
The church of Saint Francesco in Santpedor in Barcelona: (a) The church floor plans after intervention, (b) The church sections and façade after intervention, (c) some external and internal photos of the auditorium. Source: [61] And photos ©Jordi Surroca.

partial collapses of the roof have been filled in with glass windows, and the modern glass windows have also been used, allowing natural light to flow inside. It consolidated natural light placed the proper technical equipment, and added an exterior vertical staircase to preserve the unity of the inner church's nave. New stairs and ramps with geometric shapes are placed in the ancient central nave leading to the two upper mezzanine levels in the wings of the church for historical archive use. Concrete supports were used to create new areas for the storage of large technical equipment [62].

2.7 St. Peter's Church (D Petrus) in Vught in the Netherlands

St. Peter's Church was built between 1881 and 1884 and extended in 1935. In 2005, St Peter's Church stopped using it for religious activities because of the need for restoration. Although the funding challenges, the church demolition was replaced with social use, and the restoration was later implemented to its exterior masonry, roof and openings in 2011–2012. It has been a library, museum and community centre (DePetrus) in Vught since 2018 [63]. According to Hauke et al., this church's intervention is a kind of creative reuse of the old buildings as libraries. A radical renovation was done to the church to preserve the characteristic elements such as stained glass windows, vaults and confessionals [64].

The church's original windows work in tandem with the added lighting to create a bright, well-lit space. The renovations also concerned the roof, leadworks, gutter and drain to prevent further leakage; electrical heating installations and radiators under the paintings and windows to prevent cold traps; the floor has been removed and replaced by a floor system with isolation and heating. A thin mezzanine floor surrounding the original central space connected to the first floor has been added. The added part forms interior walking paths in an organic shape as a curled ribbon along pilasters in an eye-catcher visual effect in contrast to the traditional rectilinear plan of the church and offering a panoramic view of its opened interior for events, as shown in **Figure 11**. The first floor has fire resistance and acoustic facilities that reduce the reverberation time and ambient noise because of the height of the building (about three-storey height) and the multiple utilizations (such as reading books, playing billiards, activities, meetings

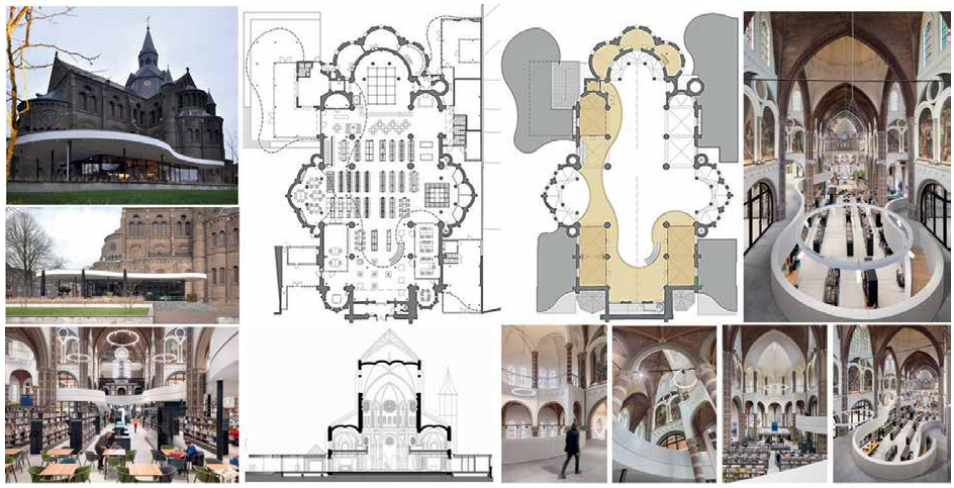


Figure 11.
St. Peter Church's floor plans and section after intervention and photos of exterior and interior. Source: [63, 65].

and courses) under it to 95 per cent. The mezzanine floor continues outside as the roof of four pavilions connected to the church to expand the exterior space and provide an entertainment zone. The flexible church' floor provides room for events on all scales and functions as a library. Where the bookshelves are easily accessed and are installed on a rail system that can be moved to the aisles when ample space is needed to create private areas for events, meetings or small conferences [63, 65].

3. The results and discussion

Cultural heritage is a record of the total cultural, architectural, artistic, sociological, economic and environmental aspects of the time and space, not merely an object. Therefore, the era challenges impose on us to go far from strict conservation principle and the Articles of the Venice Charter avocat the reuse of the same previous usage and prevent falsifying the artistic or historical evidence by distinguishing the new materials from the old ones. Reusing historic buildings is not a new process; it has been made throughout history to save resources, time, material, and craftsmanship, give life, and maintain the buildings whether they happened calculatedly or not. The local reclaim of historical monuments through preserving, maintaining, and adaptive reusing them gives a breath to our cultural heritage and more linkage to the local people who are partners, and their satisfaction indicates how successful reuse has been done. The increasing closure of churches has caused using them with architectural forms and functions not previously associated with religion to link their communities to the place and to provide the communities' needs of business, culture and entertainment facilities. The second part of the research presented international examples of the adaptive reuse of historic churches from America and Europe. The selected case studies present the diversity of the function which can be chosen in the churches' conversion and the methods of redesigning their interior spaces, and their role in local community development, such as restaurants, residences, indoor climbing gyms, libraries, concert venues, community centres, and office space for businesses and non-profits. Despite some reuse functions giving more financial input to operation and tourism and are a way to protect valuable heritage structures, they evoke society's emotions, such as the nightclub and modern houses. With the current mania for tearing out old fabric and replacing it with tawdry modern materials, several demonstrated calls on the relevant authorities to save the historic buildings of the vandalism perpetrators and the mistreatment of the church and holy places. The above cases, **Table 1**, have shown the need for a wise decision to choose the proper function to meet the current and new requirements. Two main approaches to adapting intervention could be distinguished:

- The minimal intervention where the architects and designers focused on preserving as much as possible of the original structure and building materials and integrating these components into the general design for the new use, with some examples confirming the preservation of the effects of aging on the surfaces, walls and other original components as a kind of respect for the memory of the place. In addition, the use of available technologies to adapt to the needs of this age and reduce the current and future pressure on ancient buildings, their neighbourhoods and their indigenous communities, such as restoring recycling and using some of its materials, and adding what is needed for new usage in terms of non-destructive needs and structures. Where the new additions were mainly limited to the completion of the damaged structure' components by differentiating

Case study name- Location/ Building date	Original use	Current use/ Intervention period/ Architects& conservators	Reason for previous abandonment/ later preservation & reuse	Notes/Awards
Santa Maria Church of Vilanova de la Barca- Lleida, Spain /was built in the thirteenth century	Church	Multi-purpose hall for exhibitions and concerts. /2015–2016/ AleaOlea architecture & landscape, Spain.	Due to the damage of the Spanish civil war in 1936, then it was abandoned for more than 80 years. In 2009, it was decided to stop the decay and to conserve it in its current condition.	Catalonia Construction Award 2017 Intervention in existing building, Fritz-Höger Award 2017 Gold Winner Renovation/ Reconstruction, Brick Award 2017 Worldwide Award, Hispalyt XIV Award for Brick Architecture, RIBA Award for International Excellence 2018, Wienerberger Brick Award Special Prize 2018.
Selexyz Dominicanen Church- Maastricht, the Netherlands / was built in 1294.	Church/ Different later functions (storage, school, multicultural space, library)	Bookshop /2006/ SATIJNplus Architecten, and Merkx+Girod Architecten	The Dominicans oust and its later multiple community functions and the poor conditions in the 1990s until being a part of the rehabilitation project of the shopping centre Entre-Deux is started in 2000.	EU Mies Award 2009
St.Vincent de Paul Church- Brooklyn, New York, the U.S / was founded in 1860.	Church	104 Multi Family Residential Units (Spire lofts) /2014/ Zambrano Architectural Design (ZAD)	It was closed in 2004 due to the church' deteriorating and the declined number of its parishioners. In 2014, the maintenance inability of the diocese and to get a community development outcome.	Nominated for BAQ 2020 award for category heritage architecture intervention or Heritage interest.

DOI: http://dx.doi.org/10.5772/intechopen.110280

Case study name- Location/ Building date	Original use	Current use/ Intervention period/ Architects& conservators	Reason for previous abandonment/ later preservation & reuse	Notes/Awards
Santa Barbara church- Llanera, Asturias region, Spain /was built in 1912.	Church	Public skate park /2015/ Church Brigade collective and the artist Okuda San Miguel	Abandoned until 2007 due to the dwindling attendance and their emigration after the end of the Spanish Civil War and the demolition of the area to have an industrial estate. The church was sold to a commercial agent who decided to use it for his skateboarding hobby.	Financial support from online fundraising and some commercial brands
St.Mary's Church- Dublin, Ireland /was built between 1700 and 1704.	Church/ became a retail outlet after deconsecration	Café, bar, restaurant and nightclub called "The Church" /2007/ DMOD Architects	It was purchased by a publican in 1997. Then, the building was refurbished and opened in 2007.	The tasteful conversion and refurbishment of this Dublin landmark was acknowledged at the Dublin City Neighbourhood Awards 2006, where it won first prize in the category of Best Old Building.
Saint Francesco Church- Santpedor, Barcelona, Spain / was built in the eighteenth century	Church/ Various purposes after deconsecration.	Cultural facility, auditorium and historical archive on the upper floors /2005–2011/ David Closes Arquitecte	It is in destructive state with a damaged vaulted ceiling. With the aim to adapt the church to reuse the rehabilitation project was started in 2005 until 2011.	Characterized by contemporary predominance by using additions and interposed contrasted volume in a juxtaposition way.
St. Peter's Church (D Petrus)- Vught, the Netherlands /was built between 1881 and 1884	Church	Library, museum and community centre (DePetrus) /2018/ Dutch firm Molenaar&Bol&vanDillen Architecten	The need for restoration and the demolition was replaced with social use in 2018	Classified as a kind of creative reuse of the old building.

Table 1.
Summary of the seven selected historic churches.

the original and the added building materials in order to reuse it and using the light system or acoustic or heating and cooling facilities with structurally reversible furniture interventions, as it was shown in Santa Maria Church of Vilanova in Spain and Selexyz Dominicanen Church in the Netherlands.

- Creative design in adaptive reuse, where adaptive reuse projects can completely replace, repair, preserve or restore the building envelope (roof, windows, doors, and wall systems) in a specific way by building envelope design professionals. Where exteriors are not altered, the roofs, arches and traditional shape for the facades and the openings are retained. At the same time, the interiors are remodelled to adapt to the new design and needs, as in the cases of converting old vacant churches into modern houses, such as James Spicer Memorial Church Hall School in London. The intervention can use new elements and interposed contrasted volume alongside the old fabric in a contemporary predominance such as the church of Saint Francesco in Barcelona. Creative design can use innovative adding and contrasting and audacious interventions for furthering the new use as a radical renovation, such as St. Peter Church in Vught.

The Local authorities in Syria play a significant role in deciding and developing policies addressing the conservation and adaptive reuse of historic buildings. Most registered heritage buildings in Syria are government properties, and a few are private properties. The government-related authorities are the only body that can support the adaptive reuse, rehabilitation and retrofit projects for historic buildings and listed and certified properties. Community involvement and the authorities acting together can make the difference between failure and success. Compared with worldwide successful Adaptive Reuse case studies, a possible solution or a new public function could be presented to the historic churches towards continued usage of the heritage buildings, providing financial support for restoration and further treatment possibilities.

3.1 General principles in the process of adaptive reuse, creative activities and intervention

Many principles must be taken into account in the process of adaptive reuse design, creative activities and intervention, which help in the success and continuity of reuse and preservation operations, and these principles are as follows:

3.1.1 Authenticity

It is known that when carrying out the reuse of inherited buildings or sites, this intervention process loses the building or place part of its originality, and the amount of this lost originality varies according to the preservation policy and the method used, but it is vital to preserve as much as possible their authenticity and deal with them as historical evidence and not as works of art only by the following:

- Preserving the greatest amount of original materials and achieving harmony between the old and the new.

- Not allowing additions to dominate the original structure in proportions and design.

- Taking into account the originality of the different techniques and styles in the building.

- Not alienating the building by using it for new purposes that harm its social, cultural or historical status or purposes that are completely far from its original use and capabilities. The usage should be acceptable for the building's surrounding community, especially for reusing the churches and religious buildings.

3.1.2 Reversibility

The principle of reversibility had to be applied in adaptive reusing processes, both in materials and in procedures relating to removals or additions. It aims to leave the buildings open to future technologies, which may be less harmful to buildings and heritage sites and more to preserve their authenticity, with the aim of leaving the field open also for evaluation of the implemented conservation operations, the possibility of correcting errors and making future modifications, which help the restored sites keep pace with the era and its uses and keep pace with emerging conservation theories.

3.1.3 Sustainability

It is a fundamental principle in order to ensure the continuity of operation of projects and sites that are preserved and developed and to ensure that they cover their future maintenance costs. Achieving the dimensions of sustainability is done through the following:

- Adopting a complete operational program in terms of selecting the proper job that meets the community's needs stems from its choice and is also consistent with the capabilities of the place.

- Encouraging human energies and finding income-generating sources through the use of heritage buildings and sites in the economic development of society, the possibility of establishing small projects, providing places for production, display and marketing, and encouraging the private sector, in addition to encouraging human development projects such as libraries and information network sites.

- Increase community awareness of the importance of cultural heritage and disseminate ideas related to this to achieve its continuity and permanence.

- Adopting a clear maintenance strategy by selecting materials characterized by their durability and ability to resist various factors and appropriating part of the income of preservation projects for permanent maintenance.

3.1.4 Community involvement

The tangible heritage is linked to the intangible heritage and its inhabitants who are primarily concerned with preserving it and the beneficiaries of its operation, which made the process of community participation in the management of heritage not only a driver of heritage. Community Involvement should involve local citizens in all stages of the urban heritage preservation process. It is one of the essential principles in preservation, reusing and operating processes for the following reasons:

- The right to self-determination of heritage communities is one of the rights of its citizens.

- Contribute effectively to educating people about the importance of heritage, preserving and operating it, and its benefits.

- Making heritage a part of people's lives facilitates preserving and maintaining it, not destroying it, and feeling that it belongs to them and is not just an extraneous project.

- The community participation process also contributes to knowing the actual needs and demands of people in heritage sites and trying to meet them through conservation and reusing projects. It forms a basis for community development by educating and crafting heritage as a community resource in the economy of historical cities.

3.2 Adaptive reuse framework of the historic churches/buildings

Based on the above analysis and literature review, a framework for the adaptive reuse process of the historic building is proposed as following stages, **Figure 12**:

3.2.1 Before decision-making

After determining the targeted building, a stepwise approach might be followed before choosing the new function taking into account the following points:

- Documenting & Definition: documenting monumental buildings is an initial step in the process of adaptive reuse because it provides all documentation and maintenance records, old plans and reports, and the history of previous repairs to the target building. It gives information about the building value, possibilities, locals and site' needs and characters, and structure situation.

- Monitoring, measuring and investigating the building envelope are extra surveys that can help in the quality guarantee. The importance of conducting a complete assessment of the condition and the building envelope by specialists so that the assessment serves as a guide for the adaptive reuse project that helps prevent unexpected and often costly problems and determines how to adapt the elements of the building envelope accurately.

- Considering the urban environment, its functional uses and local community, and the need to consider the historic building as a component and part of an urban fabric to improve the surrounding area is a focal point in this step. The research demonstrated how the adaptive reuse of architectural heritage could act as a motivator for the transformation of the urban landscape and have a significant impact on environmentally, socially and economically sustainable development. Besides, the need to know the needs of the local people and respect their habits in the reuse process emphasises the empowerment of citizens to trust their common sense and become the defenders of their place.

- The conclusion of this step provides the problem and needs' Definition.

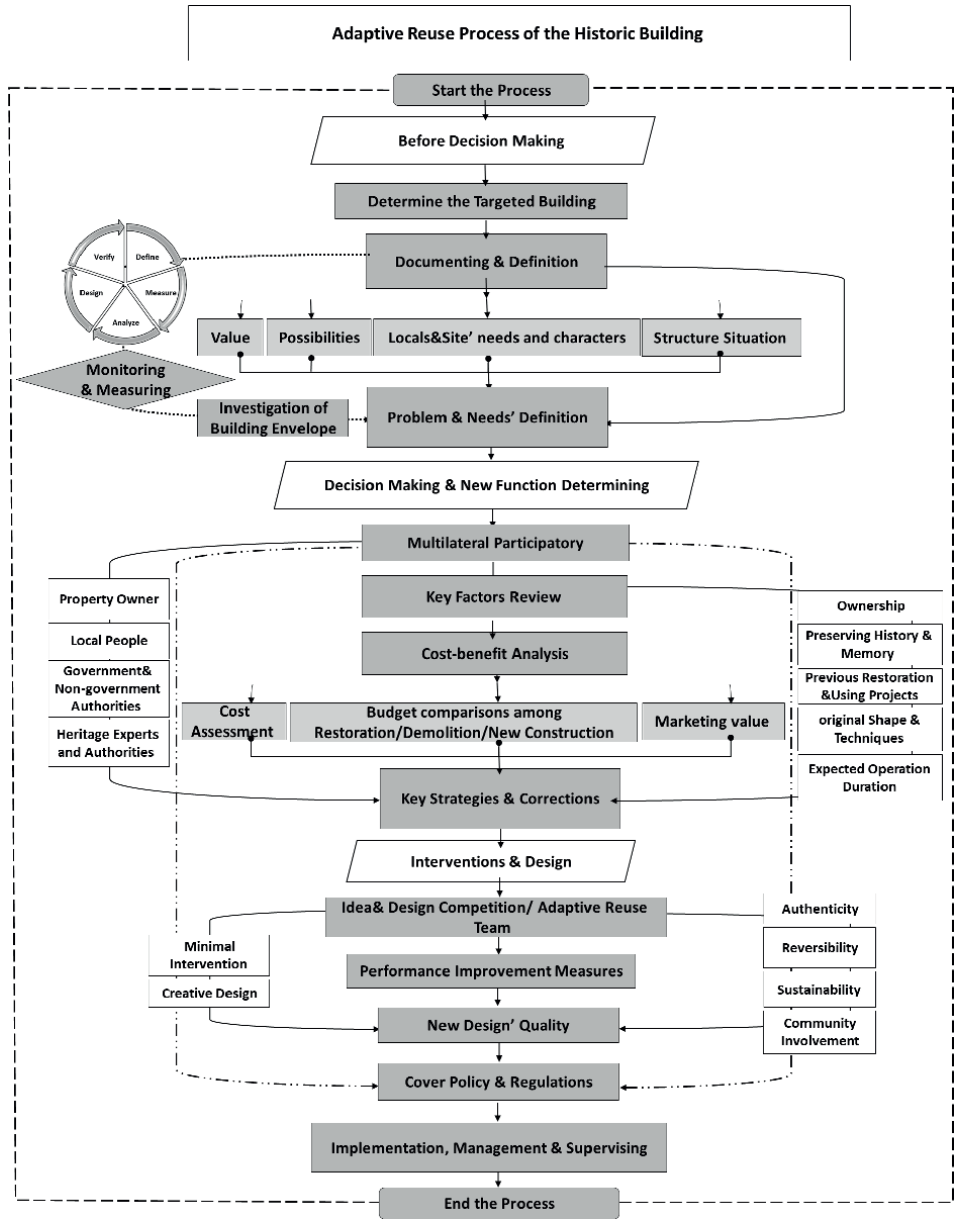


Figure 12.
Flowchart of the adaptive reuse process of the historic building. Source: Author.

3.2.2 Decision-making and new function determining

- The decision-making process is a multilateral participatory based on the involvement of the property owners and local population and consideration of their basic needs without conflict with the principles of protecting cultural heritage and the aspirations of the municipality and the authorities authorized to preserve

cultural heritage (governmental and non-governmental bodies) and the cultural heritage experts.

- The need to review some key factors before making a decision, such as ownership, preserving history and memory, previous restoration and using projects, original shape and techniques, usable life, the expected replacement for each component, and expected operation duration.

- This is followed by a cost-benefit analysis, budget comparisons among restoration/demolition/new construction, cost assessment and a study of the marketing value of the building.

- The conclusion of this step provides key strategies and corrections.

3.2.3 Interventions and design

Once a decision has been made to undertake adaptive reuse, the next step is to determine how it will be done in historic buildings.

- Idea and design competitions play an instigating role in selecting appropriate designs for buildings and provide a multiplicity of opinions and design options for decision-makers.

- The success of any adaptive reuse project is directly related to the quality and expertise of the team that performs it, which should include the owner, architect, restorer, and the consultation and participation of experienced technicians and historical conservators from a government conservation office such as the Old City Technical Office or Department of Antiquities and Museums.

- Defining proper design (minimal intervention, creative design) of the new use and its activities is the result of a collaborative decision-making process that takes into account the nature of the building, its heritage values, its location and accessibility, and the role of the building in the whole neighbourhood, with the possibility of creating job opportunities for its residents, especially in the old cities whose residents face poverty and unemployment.

- Adherence to the general principles of adaptive reuse and intervention that we mentioned above (Authenticity, Reversibility, Sustainability and Community Involvement) and the measures of performance improvement to ensure the quality of the new function and design.

- The structural integrity of the building is one of the essential factors that determine the success of reuse, as it requires a proactive look at the structure and the new loads it will bear, the possible strengthening techniques for it, the impact of mechanical systems and the structural modifications it requires to suit its use. In addition to a comprehensive understanding of the building envelope and what can be done to improve performance while minimizing the impact on the final aesthetic, to achieve climate-adapted buildings and to bring about an upgrade to their internal environmental conditions.

- Cover policy and regulations should be treated and prepared in all steps and at the end of the process before the implementation, management and supervision, which is the final step in this process.

4. Conclusion

This chapter started with a review of the global evolution of reuse and adaptive reuse' principles and approaches. The research focused on historic churches as sacred buildings that are not easy to change for several spiritual, symbolic, and moral considerations and values before they are historical or aesthetic, down to describing three targeted historic churches in Syria. Seven global examples of the adaptive reuse of historic churches were presented to highlight their experience and the various functions utilized in their adaptive reuse and distinguished some socially unacceptable functions for church reuse. The decreased number of parishioners of the churches in several cities around the world, simultaneously with the growing environmental concerns and rising demolition costs, promoted the adaptive reuse of historic churches. In all presented cases, the architect's creativity and inventiveness played a significant role in determining the financial feasibility of the adaptive reuse of existing buildings. Where sometimes the costs could not be cheaper and could fall within the range of new construction. The research distinguished two main approaches to adapting interventions used in these global examples, where some examples used minimal intervention, and others preferred the creative design. General principles in the process of adaptive reuse, creative activities and intervention were summarized, and a framework for adaptive reuse of the historic churches/buildings was introduced. Due to the lack of adaptive reuse research and projects in Syria, the research framework and results could be helpful for Syrian cases. They also could be generalized in any other global cases.

Author details

Maya Hassan
Tishreen University, Faculty of Architecture Engineering, Lattakia, Syria

*Address all correspondence to: eng.mayahassan@gmail.com

References

[1] Aversano N. Heritage Assets. In: Farazmand A, editor. Global Encyclopedia of Public Administration, Public Policy, and Governance. Cham: Springer; 2016

[2] Carnegie G, Wolnizer P. The financial value of cultural, heritage and scientific collections: An accounting fiction. Australian Accounting Review. 1995;**5**(1):31-47

[3] Australian Government Department of the Environment and Heritage. Adaptive Reuse: Preserving our Past, Building our Future. 2004

[4] Plevoets B. Retail-Reuse of Historic Buildings. Master Thesis of Conservation of Monuments and Sites. Leuven: Katholieke Universiteit Leuven; 2009

[5] Kee T, Chau KW. Adaptive reuse of heritage architecture and its external effects on sustainable built environment—Hedonic pricing model and case studies in Hong Kong. Sustainable Development. 2020;**28**(49):1597-1608

[6] Hassan M, Xie H. Climate Change and Conservation of Coastal Built Heritage. Singapore: Springer Nature Singapore Pte Ltd.; 2020. p. 2020

[7] Jokilehto JI. A history of architectural conservation: The contribution of English, French, German and ITALIAN Thought Towards an International Approach to the Conservation of Cultural Property. 1989. pp. 0337-0337

[8] Ruskin J. The Seven Lamps of Architecture. Vol. 7. New York: John B. Alden; 1885

[9] Locke WJ. Recommendations of the Madrid Conference. Vol. XI. Third Series, point 2. The Architectural Journal: Journal of the Royal Institute of British Architects (RIBA). 1904

[10] Charter A. The Athens Charter for the Restoration of Historic Monuments. In: 1st International Congress of Architects and Technicians of Historic Monuments, Athens; 1931

[11] Charter V. International charter for the conservation and restoration of monuments and sites. In: Second International Congress of Architects and Technicians of Historic Monuments. International Council of Monuments and Sites (ICOMOS): Venice; 1964

[12] ICOMOS. The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance: With Associated Guidelines and Code on the Ethics of co-Existence. Burwood ed. Burra, South Australia: Australia ICOMOS. 2000;1999

[13] Cantell SF. The Adaptive Reuse of Historic Industrial Buildings: Regulation Barriers, Best Practices and Case Studies, Degree Master of Urban and Regional Planning. USA: Virginia Polytechnic Institute and State University; 2005

[14] Jacobs J. The Death and Life of Great American Cities. New York: Random House; 1961

[15] UNESCO World Heritage Committee. Budapest Declaration on World Heritage. Budapest, Hungary: The World Heritage Newsletter 35; 2002

[16] Roders AP, Van Oers R. World heritage cities management. Facilities. 2011;**29**(7/8):276-285

[17] Lang MJ. D.C. mayor Unveils Plans to Incentivize Office-to-Residential

Conversions as Downtown Struggles to Recover. Washington, D.C, USA: The Washington Post; 2021

[18] ASARB. U.S. Religion Census. Association of Statisticians of American Religious Bodies (ASARB), Databases, 1952-2010

[19] Berkovitz N, Herr MB and Law J. New Life for White Elephants: Adapting Historic Buildings for New Uses. Preservation Information. 1996

[20] Simons R, Choi E. Adaptive reuse of religious buildings and schools in the US- determinants of project outcomes. International Real Estate Review. 2010;**13**(1):79-108

[21] Kilde JH. Sacred Power, Sacred Space: An Introduction to Christian Architecture and Worship. Oxford: Oxford University Press; 2008

[22] Garstka BJ. Holy Renovations: Adaptive Re-Use and Dependent Stakeholder Opinion of Converted Church Buildings. MS thesis. 2012

[23] Georgescu Paquin A. L'actualisation du patrimoine par la médiation de l'architecture contemporaine, Avignon: Sciences de l'information et de la communication. Français: Université d'Avignon; 2013

[24] Fiorani D. Conservation and new uses in the space of the holy. In: Fiorani, Donatella, et al., editors. Conservation/ Adaptation. Keeping Alive the Spirit of the Place. Adaptive Reuse of Heritage with Symbolic Value. Hasselt, Belgium: EAAE; 2017. pp. 117-130

[25] Mirza-Avakyan G. Adaptive reuse of historic churches in new York City: The opportunities and challenges for community development (thesis). In: M.S. Degree in urban planning. New York, USA: Columbia University; 2013

[26] Antiquities and Museums Department in Tartous. Tartous Historic Buildings. historic buildings section, Tartous, Syria: Antiquities and Museums Department; 2016

[27] Kennedy H. Crusader castles. Cambridge, UK: Cambridge University Press; 2001

[28] Piana M. Die Templerburg Chastel Blanc (Burǧ aṣ-Ṣāfītā). Burgen und Städte der Kreuzzugszeit, (Studien zur internationalen Architektur- und Kunstgeschichte, 65). 2008:293-301

[29] Rey EG. Etude sur les monuments de l'architecture militaire des croisés en Syrie et dans l'île de Chypre. Vol. 1. Impr. nationale. 1871

[30] Mesqui J. La fortification des Croisés au temps de Saint Louis au Proche-Orient. Bulletin Monumental. 2006;**164**(1):5-29

[31] Deschamps P. Les châteaux des croisés en Terre Sainte/3. In: La défense du Comté de Tripoli et de la Principauté d'Antioche Album. Paris, France: Les châteaux des croisés en Terre Sainte 90; 1973

[32] Michaudel B, Hasan H and Major B. Cathedral of Our Lady of Tortosa/Museum of Tartus (Tartus, Syria). Museum With No Frontiers (MWNF), 2004—2022

[33] ArchDaily. Santa María de Vilanova de la Barca/AleaOlea architecture & landscape. ArchDaily; 2017

[34] Arribas Sánchez C, Olivés Salvadó J. Reportatge: Un nou espai sensible a l'antiga església de Santa Maria de Vilanova de la Barca. L'informatiu. 2018;**357**:82-95

[35] Louw M, Papanicolaou SS. Buildings Reimagined: A Dialogue between Old

and New. Melbourne, Australia: The Images Publishing Group; 2019. p. 288

[36] EU Mies Award. Bookstore Selexyz Dominicanen Maastricht. 2022. [Online]. Available: https://www.miesarch.com/work/660 [Accessed: October10, 2022]

[37] Szuta AF, Szczepański J. Striking elements–a lifebelt or a fad? Searching for an effective way of adapting abandoned churches. Frontiers of Architectural Research. 2020;**9**(2):277-286

[38] Hughes CJ. Buildings with a Past. New York, USA: The New York Times; 2014. p. 1

[39] Thomas L. ST.Vincent de Paul, Brooklyn, Ny- Another source for information on the Donnelly/Reilly Family. 2013. [Online]. Available: https://rootsofkinship.com/2013/05/26/st-vincent-de-paul-brooklyn-ny-another-source-for-information-on-the-donnellyreilly-family/ [Accessed: 2022]

[40] Brooklyn Catholic. Brooklyn Catholic, St. Vincent de Paul, Williamsburg. 2013. [Online]. [Accessed: February 8, 2022]

[41] Short A. Catholics save relics from out-of-business W'burg church. 2011. [Online]. Available: https://www.brooklynpaper.com/catholics-save-relics-from-out-of-business-wburg-church/. [Accessed: October10, 2021]

[42] Zambrano Architectural Design. Spire Lofts Adaptive Reuse. Historic Preservation 163 and 167 North 6Th, Street Brooklyn, NY 11211. Brooklyn: Zambrano Architectural Design; 2014

[43] RentHop. 163 North 6th Street #A17 Williamsburg, Northern Brooklyn, Brooklyn. 2009-2022. [Online]. Available: https://www.renthop.com/listings/welcome-to-the-spire-lofts-facade-of-the-church/a17/10113886. [Accessed: August 10, 2022]

[44] Architecture and Design. A 100-Year-Old Church Transformed Into A Skate Park Painted With Colorful Graffiti. 2015. [Online]. Available: https://www.architecturendesign.net/a-100-year-old-church-transformed-into-a-skate-park-painted-with-colorful-graffiti/ [Accessed: October10, 2020]

[45] Williams RR, Hartson TE. From sanctuary to Skatepark. Contexts. 2020;**19**(3):52-59

[46] Velie E. A Church-Turned-Skate Park in St. Louis Is Raising Funds for an Arts Center. 2022. [Online]. Available: https://hyperallergic.com/726507/church-skate-park-st-louis-is-raising-funds-for-an-arts-center/ [Accessed: September: 9, 2022]

[47] SK8 Liborius Social Club. SK8 Liborius Social Club. 2022. [Online]. Available: https://www.facebook.com/SK8Liborius/ [Accessed: November 5, 2022]

[48] The Church IE. The Church Café, Bar, Restaurant. 2022. [Online]. Available: https://www.thechurch.ie/about/ [Accessed: September 9, 2022]

[49] A. Dobson. The Church Bar and Restaurant in Dublin. 2022. [Online]. Available: https://dobbernationloves.com/food-drink/the-church-cafe-bar-restaurant-and-club/ [Accessed: November 10, 2022]

[50] Irish Historic Houses. The Church, Junction of Mary's Street/Jervis Street, Dublin. 2022. [Online]. Available: https://irishhistorichouses.com/2022/11/09/the-church-junction-of-marys-street-jervis-street-dublin/ [Accessed: September 9, 2022]

[51] Christine C. Buildings of Ireland: Dublin, The City within the Grand and Royal Canals and the Circular Road with the Phoenix Park. New Haven and London: Yale University Press; 2005. pp. 89-91

[52] Archiseek. Architecture of Dublin City: 1702-St Mary's Church, Mary Street, Dublin. 2022. [Online]. Available: https://www.archiseek.com/2010/1702-st-marys-church-mary-street-dublin/ [Accessed September 9, 2022]

[53] Open house Dublin. The Church-Self Guided Tour. 2022. [Online]. Available: https://openhousedublin.com/the-church-self-guided-tour/ [Accessed: September 9, 2022]

[54] S. Murphy. Treatment of St Mary's Churchyard, Dublin. Centre for Irish Genealogical and Historical Studies. 2006

[55] Geograph Photograph Every Grid Square. John M Keating's, Restaurant, Cafe and Bar, Mary St. 2022. [Online]. Available: https://www.geograph.ie/photo/573716 [Accessed: September 9, 2022]

[56] HGC Construction. Taft's Ale House. 2015. [Online]. Available: https://hgcconstruction.com/our-work/tafts-ale-house/ [Accessed: November 11, 2022]

[57] Void Acoustics. The Church Nightclub. 2021. [Online]. Available: https://www.facebook.com/story.php?story_fbid=10158165025903157&id=73919328156&p=30&paipv=0&eav=AfYYhWrRpPmqrPfQ0l1Go6GThAZonhYkIeVchzwHJfSe3Gbude1ePl8pQK9MDI82vCc&_rdr [Accessed: October10, 2022]

[58] Nationa Design Academy. Pitcher and Piano, Nottingham; Refurbishment. 2022. [Online]. Available: https://www.nda.ac.uk/blog/pitcher-and-piano/

[59] Vessel Nola. Vessel Nola. 2022. [Online]. Available: https://vesselnola.com/ [Accessed: November 11, 2022]

[60] National Trust for Historic Preservation. Church Brew Works in Pittsburgh, Pennsylvania. 2015. [Online]. Available: https://savingplaces.org/stories/church-brew-works-in-pittsburgh-pennsylvania [Accessed: October10, 2022]

[61] Yatzerlab. The Saint Francis Convent Church by David Closes in Santpedor, Spain. 2012. [Online]. Available: https://www.yatzer.com/Saint-Francis-Convent-Church-David-Closes-Santpedor-Spain [Accessed: October10, 2022]

[62] de Jonge W. Sleeping beauty: Heritage & Architecture. Delft Lectures on Architectural Design. 2017;**2018**:316-335

[63] DePetrus. DePetrus Vught in a Nutshell. 2018. [Online]. Available: https://www.depetrus.nl/wp/wp-content/uploads/2018/12/DePetrus-info-English-MvdH.pdf [Accessed: September 9, 2022]

[64] Hauke P, Latimer K, Niess R. New Libraries in Old Buildings: Creative Reuse. Berlin, German: De Gruyter; 2021. p. 390

[65] ArchDaily. Library, Museum and Community Center 'De Petrus' / Molenaar&Bol&vanDillen Architects. 2008-2022. [Online]. Available: https://www.archdaily.com/892558/library-museum-and-community-center-de-petrus-molenaar-and-bol-and-vandillen-architects [Accessed: October10, 2022]

Section 3

Loss of Identity Cultural and Architectural Heritage

Chapter 8

Unwanted Cultural Heritage of the Republics of the Former Yugoslavia

Dejan Dašić

Abstract

The subject of this paper is the systematic destruction and the current state of monuments to the national liberation struggle in the former Yugoslavia. The aim of the paper is to point out the fact that after the breakup of the former Yugoslavia in 1990, in all republics, to a greater or lesser extent, deliberate neglect or targeted destruction of cultural heritage created in the period between 1945–1990. Monuments erected to commemorate the anti-fascist struggle in the Second World War are desecrated, neglected or demolished. For the purposes of this article, the secondary data sources have been used, including information available on the Internet, daily newspapers, as well as in the relevant literature on. The method of qualitative data analysis was applied. In addition to the above, the paper will use relevant examples on the topic of destruction of monuments. The politicization, revision and mythologizing of history in our time is particularly expressed in the way we treat cultural heritage. There are positive examples of restoration of demolished monuments from that period, but for now it is still not enough.

Keywords: cultural heritage, monuments, anti-fascism, revision of history, restoration, Yugoslavia

1. Introduction

The Second World War, as the most massive loss, is marked by examples of terrible suffering and unimaginable destruction of humanity. After the end of that terrible war, numerous monuments were erected all over the world in order to remember that dark period of human civilization, but also as a warning to the generations to come, so that something similar does not happen again. Monuments are silent witnesses of the time in which they were created, they provide us with knowledge about customs, culture, religion, wars, etc.

And yet, some authors [1] ask the question what to do with architectural heritage that has strong symbolic connotations? Is it acceptable that we guard the camps that others have formed, but not the mausoleums that they have erected? Where is the limit? Is morality its sole arbiter? Should the new government demolish in Spain the Valley of the Fallen where Franco is buried, in Bulgaria the mausoleum of Georgy Dimitrov, in Berlin Hitler's bunker which today is located under the parking lot in the very center of the city, marked only by a small sign? Or is it taken for granted that we should selectively take care of unwanted heritage? Who is to decide that?

Not far from Weimar, there was an oak tree under which Goethe (Johann Wolfgang von Goethe) liked to sit and talk about literature with his friend Eckermann, a tree in whose canopy "one feels great and free." In 1937, that forest was cleared to build a concentration camp. But unlike the life that no law could protect, Goethe's oak was preserved by a special Law on the Protection of Nature, which was passed by the Nazi regime. For the Germans and the prisoners, the oak tree had completely opposite meanings. While the "SS" believed that by preserving it they were preserving the image of Germany as a protector of the highest heritage values, until then it was a symbol of "life" in the concentration camp for the inmates.

For example, in the Polish forests there are the remains of Hitler's infamous "Wolf's Den". The hermetically sealed and well-guarded complex was most likely built in 1940 on about two and a half square kilometers. That fortress was supposed to be impregnable, with about 50 bunkers, 70 barracks, two airports, a railway station and anti-aircraft defense systems. After the Second World War, the locals were supplied with construction materials here, and tourists started coming in 1959—when the mines were removed. It is now an attractive tourist destination. After a private investor invested 1.6 million euros in 2012, since 2017 the "Wolf's Lair" has been under state administration, and about 300,000 visitors come every year [2].

Ancient places represent an example of the existence of our collective culture. Baghdad's famed "House of Wisdom," the city's first university, was deliberately demolished when Genghis Khan invaded Baghdad in 1258. Islamic State militants ransacked the central museum of Mosul, destroying priceless artefacts dating back thousands of years [3].

Recently, we have witnessed a new "popular" movement of memory cultures in former colonial countries: the demolition and performative destruction of monuments that celebrate the memories of colonialism, as well as the racist political order and ideology.

A statue of Thomas Jefferson (**Figure 1**) was removed from New York City Hall because of his involvement in the slave trade. After the killing of George Floyd in Minneapolis, there were new demands to remove the monument. His statue is an identical replica of the bronze sculpture by Pierre-Jean David D'Angers that is on exhibit at the US Capitol and has been there since 1915. It will now be transferred to the New York Historical Society. Similar monuments have recently come under fire from anti-racism demonstrations, and several statues of Jefferson, particularly

Figure 1.
Statue of Thomas Jefferson (left) and workers removed statue (right). Source: https://www.novosti.rs/planeta/svet/1058696/tomas-dzeferson-njujork.

those in Georgia and Oregon, have already been taken down or destroyed. Statues of Confederate commanders from the American Civil War were also demolished [4].

In Italy, a debate was recently launched at the national level about the fascist monuments erected throughout the country. Experts say that some are wondering if the monuments of those who promoted racist ideas should be destroyed.

Many monuments from the period of the Soviet regime were destroyed or removed in the 1990s, and some countries decided to deal more actively with them. In 2015, a "decommunization" law was passed in Ukraine, which made it possible to remove from the public sphere works of art with communist symbols. In addition, communist monuments are a frequent target of vandals in Ukraine, as happened to the monument in Lviv dedicated to all the heroes of the Second World War. Grutaš Park is a place in the southwest of Lithuania where most of the monuments from the communist era are located. After declaring independence in 1990, Lithuania removed all statues of leaders and other communist figures. After a heated parliamentary debate, most of them were placed in designated shelters, but a large number of them were destroyed completely. In 2007, the authorities in Estonia removed from the center of Tallinn a monument to a Soviet soldier who, with his head bowed, mourns the death of a soldier during the conflict with the Nazis.

The peoples of Yugoslavia knew how to repay those who won their freedom in 1945, with monumental monuments reminding them of the famous battles of the People's Liberation Struggle, naming streets, squares, schools and institutions after deserving individuals and national heroes, as well as brave units.

These monuments of the late Soviet era, some of which were built to commemorate the struggle of the Yugoslav people against the occupation of the Axis Powers during the Second World War, are very attractive today. Monumental structures stand as memories and symbols of the unity of that nation. Today, they are mostly valued for the amazing sculpting skills displayed on them.

After the victory over fascism, the construction of various memorials in the period from 1945 to 1990. year, throughout the former Yugoslavia and its republics (Serbia, Croatia, Slovenia, Bosnia and Herzegovina, Montenegro and Macedonia), efforts were made to preserve the memory of all those who gave their lives for freedom. Monuments glorifying the struggle of the Yugoslav peoples against fascism were signed by the greatest artists of that era. The monumental creations built all over the country that testified to the five-decade socialist heritage of the country were a superb combination of sculpture and architecture, and today no museum of contemporary art would be ashamed of them. One of the hopes behind the creation of these abstract, forward-looking monuments is to create an atmosphere of unity, forgiveness, and reconciliation in the post-World War II era.

However, the countries of the former Yugoslavia also dealt with monuments from the period when they were not independent in their own way. Almost immediately after the declaration of independence, the statues of Josip Broz Tito, president for life and marshal (SFRJ), were removed from most public places in Croatia and Macedonia. Later also in other republics.

Unwanted heritage, that is, the negative remains of the past resulting from the conflict, by the nature of (p)remaining, carries a pluralism of opposing ideas, which is why different groups attribute to it different interpretations, values and meanings [5]. The way history is taught in classrooms all throughout the world, which continues to emphasize our differences rather than our similarities, may be one factor. The importance of this issue is unquestionably rising as the globe appears to be splitting into diametrically opposed groups that are unable to communicate with one another [6].

2. Method

With the beginning of the breakup of Yugoslavia in 1990, the monuments from the Second World War suffered the fate of devastation and various forms of vandalism. Each newly formed state built its own image of the past in accordance with the needs of the present. Monuments have become one of the tools of the political elite, with which the public was presented what and how to remember and what to forget, from the period of the Second World War. For the purposes of this research, primarily sources from the republics of the former Yugoslavia, secondary data sources were used. They range from scientific, academic works to information available on the Internet, daily newspapers, as well as relevant monographic and teaching literature. The method of qualitative data analysis was applied. In addition to the above, the paper will use relevant examples on the topic of destruction of monuments.

3. Cultural heritage as an encumbrance of historical revisionism

History is explored by summarizing previous knowledge and studying available remains and traces. The awareness of the past of the people, to a lesser or greater extent, has been present since the earliest past, so it was nurtured even before the appearance of literacy. Oral and written tradition has preserved numerous examples to this day: jubilees, commemorations, monuments.

The term "cultural heritage" can be used to describe items passed down through the generations that are related to the cultural evolution of a community. This covers landmarks, structures, and locations with extraordinary historical, artistic, or scientific worth. Although "cultural property" is the term used in the majority of international accords, the word "legacy" has gained popularity since it suggests that the item should be preserved and taken care of.

Monuments in honor of victims, soldiers, leaders, victories and defeats have become an important component of the inventory of our civilization. Since ancient times, they have existed in continuity and have taken different forms in the environment. War artefacts of various statuses can be found all over the world, including monuments, historical monuments and tourist attractions. They can be found in city centers or appear out of nowhere. These objects are both the result of historical events and the result of the way we see rituals of remembrance. A monument directs attention to things that are significant, respected and worth remembering. Both the construction of the monument and its eventual removal or relocation have different emotional repercussions. The shape of the state or structure encourages introspection and acts as a reminder, but it also shapes certain attitudes and imagination. Memorials are the product of negotiation or imposition of a certain interpretation of historical events, as well as an effort to confirm a certain historical perspective [7].

No matter how straightforward, every spatial reality is the result of various social, political, artistic, and, last but not least, economic choices. War memorials cross many delicate lines that may both unite and divide; while they can deepen societal ties, they can also lead to conflict. In a universe of symbols and ideals that make us feel rooted in reality and history, they provide the appearance of solidity. A memorial directs attention to the things that are significant, revered, and worth remembering. Both the construction of a monument and its eventual removal or relocation have various emotional repercussions. The range of movement and emotion present across

all of these tasks is incredibly diverse. As implied by the Latin derivation of the word memorialis, the primary purpose of monuments is to act as a reminder. Form of state or structure encourages introspection and acts as a reminder, but it also molds certain attitudes and imagination. Memorials are a product of negotiating or enforcing a certain interpretation of historical events, as well as an effort to validate a particular historical perspective. They may be considered the tangible results of these efforts to create communal memory.

Changed social values and new political circumstances have made internationally recognized works of art undesirable and the target of vandalism and demolition attacks. According to Alois Riegl, who is the founder of modern monument protection, 'unwanted heritage' is heritage that has been lost to the descendants of those who created it, heritage for which there is no longer any interest. Just as history is written, important monuments are erected, remembered, but also forgotten by the victors. In the consolidation of the first national states in the region, the monuments were transmitters of moral and ideological values, and the restoration of these efforts after the collapse of Yugoslavia was artistically unoriginal. The demolition of communist monuments marked the thanatopolitical symbolization of renewed capitalism. Parades of dead bodies, as well as the reburial and demolition of statues symbolize the deeper restorative value turns of "dead body politics". Everywhere religion and nationalism were renewed through the dead [8].

Attacks on monuments—accompanied by a continuous quasi-scientific, revisionist counter-revolution—apart from attacks on civilization itself, are actually a brutal devaluation of the two highest forms of human creativity—science and art. Monuments are historical sources, testimonies of the past and a necessary condition for its interpretation. What has no source, has not been studied or does not exist anymore, it did not happen for today's man.

Some of the most important and dramatic events from recent history in these areas are marked with unwanted cultural heritage, monuments, that is, events, individuals and collectives that (re)defined the course of the twentieth century and decisively influenced our lives today. However, the historical context that is necessary for reading these monuments conflicts with the dominant politics of memory, especially the fact that the organizational structure that lay in the background of effective anti-fascist resistance was the merit of the Communist Party as the only political factor in these regions that consistently resisted fascism. That is why today the monuments that recorded the development and activity of that political subject between the two world wars, either through the organization of workers, connection with the international movement or the subversion of the monarchist system, are mostly destroyed and forgotten. Maintaining these narratives in the collective memory represents an obvious danger to those who even today destroy them or seek to ideologically 'neutralize' them.

But the cynicism of our democratically underdeveloped society reaches its maximum when we publicly marvel and condemn the violence and devastation of world cultural heritage in the war-torn and UNESCO-protected Palmyra, the Iraqi city of Mosul or the ancient Assyrian city of Nimrud, where ISIL militants destroyed statues, shrines and manuscripts, mercilessly and fanatically destroying everything that reminded them of 'those others' who do not belong to their worldview. Terrifying images of those demolitions filled our media space, while almost no one publicly thought to compare similar demolition activities from our recent past.

Identity and patriotism, and history is a key tool in this, are formed predominantly by stories about wars, battles, heroes, crimes, enemies, criminals. With the radical change in politics and social consciousness created by the ruling policy through

various ideological mechanisms, epochal social consciousness also changes. When needs change, a new narrative is sought and produced. This requires an image of the past that provides a foundation as far back as possible. The past legitimizes the new present or provides the basis for the projection of the future that the ruling policy offers. This is why revisionism occurs, the fixing of the past or the production of a desirable history. For these needs, old myths and legends are revived, until then "undesirable" or forgotten personalities, ideas and events are raised, sufferings, crimes are emphasized, and new myths are produced. As a rule, the new history is based on the negation of the existing historical story. It causes ideological and political conflicts in society. On one side, there are "defenders" of the old story about the past (regardless of how accurate it is), on the other, producers of "new history", finally discovered and until then forbidden, necessarily national, are multiplying. This is how desirable identities are established or created.

On the territory of the former Yugoslavia, politically motivated historical revisionism can be identified after the First World War, when the legitimacy and necessity of the creation of the Yugoslav state had to be proven in the new state through the past. The problem in the countries created by the breakup of Yugoslavia is that historical revisionism has become a state project and that the project has taken on the character of settling "old scores", settling political opponents, emphasizing the intolerance of the people and religious communities. All of them have in common anti-communism, anti-Yugoslavism and pronounced nationalism.

In the process of breaking up Yugoslavia (**Figure 2**), the national identity based on traditional consciousness and historical rights was the basic argument of the republic's political and military structures for the restoration of former states or the creation of new states. To that end, it was necessary to destroy and devalue everything that held peoples and nationalities together, to compromise the communist ideology [9] by means of criminalization and emphasizing single-mindedness and political terror, to divide peoples and nationalities by reminding them of the old and causing new conflicts, crimes, by producing myths and places of suffering and thereby compromise the idea of Yugoslavia and the possibility of living in a common state. In this way, the League of Communists was compromised and broken, then the Yugoslav army, security services, diplomacy. Everything that was unifying and was based on the ideas of communism and Yugoslavia was commodified and criminalized through historical revisionism.

Figure 2.
Yugoslavia after 1945 (left) and after the collapse of the state in the early 1990s (right), last century. Source: Authors works.

At the next level, the renewed national and state identity or the created new identity had to be historically grounded as far into the past as possible, insisting on tradition, historical rights, the glorious past and national idols. For this purpose, "forgotten" or "forbidden" national myths are being restored, new biographies of historical figures are being created as fighters for national, state or religious dignity and rights. This is done by recalling old conflicts, crimes, places of suffering, creating new idols and inventing examples of injustice and crime. Individuals and groups that were once condemned by their contemporaries are being rehabilitated, without proving that they were not guilty, it is enough to say that they were tried for political reasons or as fighters for statehood and national rights and that they did not have a fair trial. Losses, conflicts and problems in the past and present are readily explained by conspiracy and victim theory.

As the 1990s in the Western Balkans brought a new perspective through which ethnic groups viewed their own states, but also the past, the interpretation of the dissonant heritage acquired an additional, aggravating feature. That thread has not been broken even today - the old, official versions of history are still rejected, and almost every day we witness the rehabilitation of yesterday's enemies of the people and the change in the culture of memory. That's why often, instead of taking care of heritage for the sake of preserving knowledge about the past, the goal is to build a national identity, and instead of encouraging critical thinking, in that act we have its negation.

4. The concept of genocide of cultural heritage

War memorials become real and true manifestos to which they strive to give maximum visibility, not only physically, but also through echoes in time, registering their name and construction in the inscriptions; their destruction brings loss and misfortune, and thus an attempt is made to seal its immortality in time. War produces monuments, and at the same time monuments are involved in war by becoming one of its targets. By inscribing their name and construction in the inscriptions, war monuments acquire the status of real and legal manifestos that are sought to be given maximum visibility, not only physically but also through echo in time; by destroying them, one tries to ensure their indestructible durability in time [10].

The 1944 book by Polish attorney Rafael Lemkin is where the notion of cultural genocide first appeared. A concerted plan of numerous activities geared against the destruction of the vital foundations of the life of national groups, with a view to their full extinction, is how Lemkin defined genocide. Lemkin asserts that the destruction of the national patterns of the oppressed group and the imposition of the national patterns of the oppressors are the two stages of the social process of genocide. Analyzing the methods by which the Nazis carried out the genocide of the Polish people, Lemkin in his study Axis Rule in Occupied Europe (1944) listed eight techniques by which it is possible to carry out the genocide. He categorizes as a political, social, cultural, economic, biological, physical, religious, and moral strategy before giving a brief description of each. Lemkin, who paid close attention to cultural tactics, also created the idea of "culture genocide," which is a concrete application of the notion of genocide in general. Cultural genocide means the intentional destruction of cultural heritage and property of a certain social group, such as cultural or religious monuments, banning the use of language or certain cultural activities, and banning the work of cultural institutions. Since, for Lemkin, culture

is a key element of social integration and the fulfillment of basic social needs, any form of suppression of culture or destruction of cultural symbols can be considered genocide according to him [11].

The wealth of cultural objects as symbolic resources greatly contributes to the strengthening of group cohesion and self-awareness. Symbolic goods in contemporary armed conflicts represent one of the key targets of attack, given that they embody the identities of other communities or nations. The conflicting parties in such conflicts deliberately seek to destroy the cultural artifacts of the "other" because, in addition to reflecting their identities, they are also in the service of building national history. By destroying them, the symbols of the enemy nation also disappear, which makes it even more difficult for the opponent to construct a coherent national narrative that could be applied in the context of the political mobilization process. Another key reason for the destruction of cultural artifacts concerns the issue of territories. As Smith points out, territorialization is one of the fundamental properties of nationalism. Through the process of building an "ethno-landscape", the people and their homeland become symbolic entities. In this way, members of a particular identity group identify with the space they live in, which ultimately creates the illusion that the landscape they inhabit is an integral part of their identity and that they "emerged" from it in the past. Myths about autochthonous origins are additionally established by cultural objects such as palaces, bridges, churches and cemeteries that occupy the space in which a certain identity group lives. By destroying cultural property and clearing a certain territory of its historical and cultural objects, the ultimate goal of culturocide is to make a certain territory homogeneous and foreign to the existing community that inhabits it [12].

A nation's national and cultural identity is established, among other things, by a region's monumental legacy. Monuments related to fallen heroes are mediators between politics, the trauma of collective memory and public art. The cultural heritage of each nation also belongs to the universal cultural heritage, and this is its greatest value [13].

Monuments should connect and be in the function of peace. For example, the monuments of the World War II liberation effort in Istria, a territory on the border of Slovenia and Italy, serve as mirrors for the competing memories of the two nations and the many ethnic groups residing there on a national and regional level. Monuments serve as physical representations of official memory while also reflecting conflicts between personal recollections and the community's continued silence decades after the official memory of the former Yugoslavian system was dismantled [14].

5. Genocide of cultural heritage in the former Yugoslavia

Destroying heritage means trying to modify, falsify, mutilate, remove and, ultimately, kill the identity of a certain social group to which it belongs. In the destruction of monuments to the People's Liberation War, which was carried out during the 1990s, many sculptures, memorials and plaques dedicated to the fight against the darkness of Nazism and fascism were destroyed. In the Republic of Croatia, the "Day of the Anti-Fascist Struggle" is still celebrated, and since independence in 1991, approximately half of the anti-fascist monuments in that country have been either destroyed or damaged. After the victory over anti-fascism in 1945, around 6,000 monuments to anti-fascist fighters who laid down their lives for freedom were built in the Republic of Croatia until 1990. From 1990 to 2000, in Croatia, according to

incomplete data, 2,964 memorials were demolished, damaged, desecrated or removed from public view, including 731 monuments and other memorials of great artistic and cultural-historical value and 2,233 different memorials representing with piety towards the victims and humanistic values for the local environment, for the family, future generations. In Dalmatia, for example, out of 1,030 monuments demolished or damaged, 482 or close to 50%. In the former municipality of Makarska, the destruction of memorials to the anti-fascist struggle is 100% [15]. In the wartime circumstances of the 90s of the last century in Croatia, the facts by means of which socialization was carried out during the communist rule were "forgotten" overnight. Therefore, the demolition of partisan monuments or their damage has become an almost everyday occurrence [16].

An exceptional work, located in the small town of Opuzen, the work of the famous Croatian sculptor Antun Augustinčić. A city where all traces of the monument that Opuzen erected in 1978 in honor of his most famous son, Stjepan Filipović, who was a member of the Yugoslav partisan army, a metal worker, and commander of a partisan battalion, have been lost. He was hanged by order of the German occupiers in 1942 in Valjevo. There is a well-known photograph in which Filipović with a noose around his neck is standing under the gallows, his hands raised in the air while calling for resistance against the occupying power (**Figure 3**). One woman immortalized that moment, and the image became an icon and is now in the Holocaust Museum in Washington.

Filipović's monument in Opuzen was detonated by several young men in 1991. They were paid for it by political dissidents. Although the perpetrators were identified, they were never prosecuted, nor was a serious investigation conducted in connection with the demolition of the monument [17].

Therefore, the devastation of monuments in the sense of demolition is most pronounced in Croatia and Bosnia and Herzegovina, where around 50 percent of national liberation movement monuments were destroyed. Numerous memorials and memorial complexes in Bosnia and Herzegovina, created in the Yugoslav period and dedicated to the victims of the Second World War, are today mostly neglected or even adopted in order to promote ethno-national interests [18]. In **Figure 4**, we see the devastated Partisan memorial cemetery in Mostar in 1996, some parts of the monument demolished and plaques with the names of the fallen Partisans scattered and destroyed (left) and the monument on Makljen (right), mined and completely destroyed in 2000.

Figure 3.
Stjepan Filipović on the left, the monument erected in his memory on the right. Source: https://www.politika.rs/scc/clanak/430174/Slika-Stjepana-Filipovica-na-vesalima-je-u-UN-ali-ga-se-Hrvatska-stidi.

Figure 4.
The memorial cemetery in Mostar and the monument on Makljen (BiH). Source: [19].

The most widespread is devastation with graffiti, swastikas and local nationalist and fascist symbols of the Ustasha and Chetniks and combinations with fascist statements appear most often. In Serbia, the appearance of newly created monuments to the Chetniks has also been expressed. In Slovenia, a monument to anti-fascism was desecrated, this act was condemned by the Ministry of Culture and is being investigated by the police. Serbian medieval cultural heritage is unequivocally a victim of negation of memory, forgetting and silence in North Macedonia, and numerous historical sites in Montenegro left to the ravages of time and decay

During the destruction of war, many monuments and heritage units were destroyed (**Figure 5**). Most of them accidentally, even inevitably. However, we are witnessing the deliberate destruction of the heritage of others, with the aim of collapsing the national identity and morals of both the people and the army. Many inspirers and principals did not even hide it. So Goebbels wrote in his diaries that soldiers must target cultural centers. After the war conflicts in 1999, and as an indicator of Albanian dominance in this area, the destruction of Serbian cultural, spiritual and religious heritage gained momentum. As the heritage of others for the new political community, that heritage not only physically suffered in brutal destruction, but was also interpreted and treated differently: it was presented as its own, that is, Albanian, neglected as unwanted and used according to the needs of current politics.

In Kosovo's Vitina, where Serbs and Albanians live, at the beginning of 2013, an excavator demolished a monument to partisans killed in World War II. A group of about a hundred Albanians, led by the president of the organization of veterans of the former Kosovo Liberation Army (KLA), initially tried to demolish the monument by pushing, and then an excavator was brought in. The demolition of the monument was accompanied by excitement and applause. The demolition of this monument to the anti-fascist struggle was watched by members of the Kosovo Police. The Kosovo Police suspended five police officers because they did not prevent the demolition of the monument in Vitina.

Figure 5.
Destroyed monument of the Partisan Sixth Slavonic Corps, 1992 years. Source: https://www.antifasisticki-vjesnik.org/hr/prenosimo/6/Jak_vjetar_ili_cetnici_/350/.

The monument to Boro and Ramiz - which for decades were symbols of friendship and brotherhood of Serbs and Albanians in Kosovo was destroyed. Partisan heroes who were captured and shot together in 1943, hugging each other on the road from Djakovica to Prizren, had a monument in the city park in Pristina, where today only Ramiz remains (no Boro) (**Figure 6**).

The erasure or transformation of monument meanings is particularly visible in the case of monuments erected in honor of an idea or personality. The current community intervenes on them to show which history it does not want to remember. Monuments reminiscent of the anti-fascist struggle were destroyed, and there were also interventions that offered a symbolic upgrade, i.e. alteration of the monument. Thus, in Pristina, after 1999, members of the so-called KLA were buried at the Partisan Cemetery, while in 2006, Ibrahim Rugova, the first president of the

Figure 6.
Destroyed monument to partisans (Serb and Albanian - Boro and Ramiz). Source: https://balkaninsight.com/sr/2016/01/15/zaboravljeni-heroji-srpsko-albanskog-prijateljstva-01-14-2016/.

self-proclaimed Republic of Kosovo, was buried in the same complex. The monument to Brotherhood and Unity in Pristina from 1961 was painted in the colors of the flags of the countries that recognized Kosovo as an independent state. The careless attitude towards the monuments of the anti-fascist past is a common characteristic of all areas of the former federation, but the direct destruction they suffered in the Albanian community in Kosovo and Metohija points to the identity crisis that accompanies this society [20]. The effort to revise or completely change the existing scientific interpretations of certain events for ideological (individual or group) and political motives is to mitigate or completely remove the "negative influence" on the collective national consciousness and identity and erase "undesirable" pages of national history.

There is no doubt that remembering the past should create a sense of continuity and be a driver of development [21]. In the paper, we focused on the destruction of cultural and historical heritage created in the period between 1945–1990, however, there are numerous examples of the destruction of cultural heritage created in the Balkan Wars of 1912 and 1913, as well as after the First World War. Globalization has strengthened the role of culture as a source of local identity, and the increasing level of education and the aging of the population have contributed to the increased interest in cultural and national heritage. Heritage, that is, natural and cultural treasures should be preserved for future generations in order to preserve the identity that has become one of the most important pillars for the recognition of the tourist product [22]. Some authors remind us of the insufficient use of historically known destinations from the time of communism. The memory of communism in Serbia should be restored and shaped in a way that is acceptable to the expectations of tourists, and they suggest the creation of thematic cultural routes [23].

With the changes in government structures, a favorable climate was created for the gradual restoration of damaged monuments and memorial areas. One example of the monuments devastated in the 1990s that have been restored is the monument in the Jadovno concentration camp. The reconstruction of the monument was initiated by the Serbian National Council and financed by the Government of the Republic of Croatia. The monument is the work of sculptor Ratko Petrić, whose original work was erected in 1988, but was soon, in the early 1990s, completely destroyed [24].

6. Conclusions

Monuments are important. We can consider them silent objects and relics of history. In order to preserve the monumental heritage from further devastation, the most important thing is to clearly define the criteria for the evaluation of the memorial heritage, whereby a revisionist attitude towards the existing register of cultural monuments, on which professional names of the profession have worked devotedly for decades, should be avoided.

The culture of memory intertwines and lives through oral and written histories, memorials, monuments and toponyms. It recalls that the official memory of the Second World War and the official narrative about the past were replaced in the nations formed as a result of the breakup of the former Yugoslavia by a different narrative and a different memory, i.e. by forgetting the past, and it notes that this memory was just as official as the one that existed during Yugoslavia. In that new narrative, he continues, there was no place for remembering the common past, but that narrative was exclusively ethno-national.

Monuments became one of the tools of the new government, with which the public was presented what and how to remember and what to forget from the period of the Second World War. Just like the partisan movement, the partisan monuments commemorating the national liberation movement underwent an ideological and ethno-national transformation in order to replace the common Yugoslav past, which became undesirable in the new dominant historical narrative, with the past of the Yugoslav peoples. For this reason, during the war in the 1990s, many monuments in Croatia were damaged or demolished. Former greats of the socialist revolution, numerous monuments from the time of Yugoslavia, today in our country are forgotten, desecrated, ignored or deliberately destroyed.

A potentially better solution than removing these monuments is to provide them with additional context. Several Eastern European countries have done this by placing additional explanations next to the monuments, indicating the complex history behind them.

For example, many Roman rulers, such as Nero, were not models of morality, but there are no calls for the destruction of their monuments today because they no longer have the power to influence the definition of national identity and the dominant interpretation of history. Nevertheless, it is undeniable that the battle to define the history and identity of the nation will always have to include monuments, which, as a physical legacy of the past, play a major role in the political life of the present with their messages.

In the discourse in which conflicting politics of memory are being developed in the areas of the former Yugoslavia, the process of establishing a new relationship with the Second World War is noticeable. In the new interpretation, anti-fascism acquires a national content, due to which numerous monuments of the Second World War experience an ethno-national transformation. Monuments, memorial ceremonies, celebrations of selected dates, places of remembrance, etc. they are used as a resource for raising national awareness, separate histories, stories about national uniqueness, sacrifices made in the name of one's own nation and for its good, but also revisions of history. It is the expansion of ideology and collective identity.

Due to the location and year of its adoption, the Convention for the Protection of Cultural Property in the Event of Armed Conflict, often known as the "Hague Convention of 1954," is an international agreement that was ratified on May 14, 1954, in The Hague, Netherlands. Its purpose is to safeguard cultural property from desecration or damage, theft, robbery, and other unlawful forms of seizure, as well as military use during times of armed conflict. Any deliberate harm, intentional destruction, or misuse of the aforementioned cultural assets is prohibited by the Hague Convention [25–27].

However, what is even more important, it is not known exactly how many built memorials in the former Yugoslavia have survived to this day. This lack of information is not only a by-product of the lack of cataloging and inventory of these memorial sites, but also because they continue to be actively neglected and destroyed, not only by vandals and thieves, but also by the power of local self-governments and the governments of the former Yugoslav republics themselves.

Author details

Dejan Dašić
Faculty of Law, Security and Management "Konstantin the Great", UNion-"Nikola Tesla" University, Belgrade, Serbia

*Address all correspondence to: drddasic@gmail.com

IntechOpen

References

[1] Božić Marojević M. (Ne)Željeno pamćenje u prostorima pamćenja. Slobodne zone bolnih uspomena. Centar za muzeologiju i heritologiju, Beograd. 2015. Available from: http://www.cmih.rs/wp-content/uploads/2021/03/Milica-Bozic-Marojevic-Nezeljeno-nasledje-u-prostorima-pamcenja.pdf [Accessed October 10, 2022]

[2] Kordas S. Vučja jazbina. *Politika.* 2022, str. 7

[3] Sparrow J. If great architecture belongs to humanity, do we have a responsibility to save it in wartimes? [Internet]. 2014. Available from: https://www.theguardian.com/commentisfree/2014/oct/07/-sp-if-great-architecture-belongs-to-humanity-do-we-have-a-responsibility-to-save-it-in-war-times [Accessed: October 11, 2022]

[4] Sharp J. Statue of US President Thomas Jefferson removed from New York City Hall over slavery links. [Internet]. 2021. Available from: https://news.sky.com/story/statue-of-us-president-thomas-jefferson-removed-from-new-york-city-hall-over-slavery-links-12476201 [Accessed: September 10, 2022]

[5] Alaida A. Rad na nacionalnom pamćenju. Beograd: Biblioteka XX vek; 2002

[6] Stone P. Protecting cultural heritage in times of conflict: Lessons from Iraq. Arch. 2009;**5**:32-38

[7] Ferenc T. War monuments as vehicles of memory and activators of social. In: Korpelainen N-H, Glasser O, Aiava E, editors. Appearances of the Political Anthology Actions. Popular Inquiry. 2019. pp. 36-46

[8] Kuljić T. Novi javni spomenici u regionu - oružje u građanskom ratu sećanja. Balkan Perspectives. 2019;**11**:8-10

[9] Piasek M. Nationalising Scorched Earth – Memory and Destruction of Monuments from Vukovar to Knin. Studies on National Movements (SNM). 2022;**9**:75-104

[10] Nadali D. Monuments of war, war of monuments: Some considerations on commemorating war in the Third Millennium. Orientalia. 2007;**76**:336

[11] Novic E. The Concept of Cultural Genocide: An International Law Perspective. Oxford: Oxford University Press; 2016

[12] van der Auwera S. Contemporary conflict, nationalism, and the destruction of cultural property during armed conflict: A theoretical framework. Journal of Conflict Archaeology. 2012;**7**(1):49-65

[13] Elezović ZM. Public monument as a constituent of cultural identity of Serbs in Kosovo and Metohija. Baština. 2020;**52**:409-415

[14] Hrobat Virloget K, Čebron LN. Heroes we love? monuments to the national liberation movement in istria between memories, care, and collective silence. Studies in Ethnological Croateria. 2017;**29**:45

[15] Birovčev I. Rušenje antifašističkih spomenika u Hrvatskoj 1990-2000. Zagreb: Savez antifašističkih boraca Hrvatske; 2001

[16] Cipek T. čuvanje i brisanje. O snazi obiteljskih narativa. U: Bosto, Sulejman; Cipek, Tihomir (ur.) Kultura

sjećanja: 1945. Povijesni lomovi i svladavanje prošlosti, Disput, Zagreb. 1945;**2009**:155-167

[17] Cvetković-Sander K., Sander M. Spomenici u Hrvatskoj: kome smetaju partizani? 2021. Deutsche Welle. Available from: https://www.dw.com/sr/spomenici-u-hrvatskoj-kome-smetaju-partizani/a-57989098 [Accessed September 15, 2022]

[18] Nieblyl D. 50 Destroyed & Vanished Memorial Statues of Yugoslavia. [Internet]. 2020. Available from: https://www.spomenikdatabase.org/post/50-destroyed-vanished-memorial-statues-of-yugoslavia [Accessed October 18, 2022]

[19] Karačić D. Od promoviranja zajedništva do kreiranja podjela Politike sjećanja na partizansku borbu u Bosni i Hercegovini nakon 1990. godine. U: Zaimović, Lj., K., *RE:VIZIJA PROŠLOSTI Službene politike sjećanja u Bosni i Hercegovini, Hrvatskoj i Srbiji od 1990. godine*. ACIPS; Friedrich-Ebert-Stiftung, Sarajevo. 17-78, 2012

[20] Trajković N. Natural and cultural resources as factors of competitiveness and strengthening the performance of the tourism sector. Turističko poslovanje. 2019;**23**:5-15

[21] Dašić DR, Savić ML. The influence of cultural and historical heritage on the attractiveness of a tourist destination. Baština. 2021;**52**:247-260

[22] Đukić, S. Krivotvorenje identiteta srpske baštine. [Internet]. 2018. Available from: https://www.bastabalkana.com/2018/01/dr-jelena-pavlicic-krivotvorenje-identiteta-srpske-bastine/ [Accessed: October 29, 2022]

[23] Kuljić T. Prevladavanje prošlosti. Uzroci i pravci promene slike istorije krajem XX veka. Beograd: Helsinški odbor za ljudska prava u Srbiji; 2002

[24] Banjeglav T. Sjećanje na rat ili rat sjećanja? promjene u politikama sjećanja u hrvatskoj od 1990. godine do danas U: Zaimović Kurtović, L. *RE:VIZIJA PROŠLOSTI Službene politike sjećanja u Bosni i Hercegovini, Hrvatskoj i Srbiji od 1990. godine*. ACIPS; Friedrich-Ebert-Stiftung, Sarajevo. 93-161, 2012

[25] Schipper F. Convention for the protection of cultural property in the event of armed conflict (1954). In: Smith C, editor. Encyclopedia of Global Archaeology. Cham: Springer; 2022

[26] Schipper FT, Eichberger H. The protection of cultural property in the event of armed conflict: The cultural property protection officer as a liaison between the military and the civil sector. Present Pasts. 2010;**2**(1):31

[27] Abtahi H. The protection of cultural property in times of armed conflict: The Practice of the International Criminal Tribunal for the Former Yugoslavia. In: Connolly A, editor. Cultural Heritage Rights. London: Routledge; 2015

Chapter 9

Wind Catcher: A Lost Architectural Heritage with Timeless Passive Attributes

Asma Khalid and Nur Dalilah Dahlan

Abstract

Wind Catcher is prominently known as a passive cooling device in buildings, especially in hot humid, and hot dry regions. In metropolitan cities of Pakistan, the wind catcher is seen as a lost heritage of the past. Campaigns to revive the wind catcher as a cooling and air displacement device are surfacing amongst the global communities. The chapter aims to address the social paradigm of wind catchers in the past and present and discusses its prospects for the highly polluted cities of Lahore and Karachi with a focus on the landscape. Using digital ethnography, the responses toward wind catchers in non-residential buildings were observed via blogs and videos. A total of 1386 nodes were coded from 54 sources in Nvivo for thematic classification based on a deductive approach of Past, Present, and Future. The chapter suggests the implication of wind catcher revival in the buildings of Lahore and Karachi as an effective wind ventilation solution for indoor air pollution, infiltration, thermal comfort, and cultural identity.

Keywords: wind catcher, ventilation, chimney, passive cooling, heritage, digital ethnography

1. Introduction

Recent statistics from global networking organizations have identified air pollution as the world's biggest threat to humanity due to its enormous burden on the environment, economy, and health sector. The metropolitan cities are housed to 3.5 billion population, alarmingly doubled by 2030 [1]. It requires flexibility for the global agenda of the United Nations, Sustainable Development Goals (SDGs) adopted by many countries including Pakistan. From 1990 to 2019 onward, a high concentration of PM 2.5 outdoor air quality index has been reported in the cities of Lahore and Karachi, Pakistan [2]. There is an alarming need to control the level of outdoor air pollution, which is 7–10 times greater than the requirements set by WHO [2, 3]. Increased dependency on fossil fuels, inefficient energy practices, burning of agricultural waste, and vehicular emissions have increased the air pollution level. The Pakistan government is focusing on 2030 air pollution control measures with the help of advanced control technologies [4] and building stakeholders have a social and moral responsibility to address the issue at hand. The rising concerns of outdoor

and indoor pollution coupled with the fact that people are spending more than 90% of their time indoors, lead to serious health concerns amongst building occupants [5]. The indoor air is highly contaminated and polluted due to furnishings, lack of ventilation, and choice of heating, and cooling modes [6]. With this, there is also an increased dependence on air conditioning [7], and air purification technologies for ventilation [8].

The street-level passive ventilation methods where openings such as doors and windows are used for the exchange of air [9]. But these methods although passive and sustainable but are not able to function and circulate clean air inside the building. This is because of the densely populated, closely packed new construction in Asian metropolitan cities of China, India, and Pakistan [10]. That is why the existing outdoor micro-climate is not healthy and clean to circulate within the buildings. Whereas studies published in countries such as the UK [11], Iran [12], and Malaysia [13] prove that the high-level passive ventilation method such as wind catchers, towers, or scoops are one of the ways to circulate the high level less polluted air to inside. The ventilation method has been demonstrated in existing commercial buildings in Ahmedabad India, Tucson, Arizona, Seville, Spain [14] Riyadh, KSA [15, 16].

2. Wind catcher revival

Yasmeen Lari featured the role of traditional technologies that are low carbon and have distinctive climate features, representing the local tradition and culture [17]. These features of vernacular architecture have not been recognized by the academicians and architects equally, thereby lead to decay or not being in original use in current circumstances. Besides the existence of less energy-intensive architectural features such as wind chimney, their role, presence in ancient times, current adaptability issues, and diminishing value in a modern, contemporary low-rise building is not known.

Countries such as Iran [18], Brazil [19], Malaysia [20], China [21], Jorden [22], Algeria [23], and many others are using wind catchers (WCA) as effective air change devices for thermal comfort and Indoor Air Quality (IAQ). The commercial use of wind catchers has gone through subsequent development by combining it with various techniques [24, 25]. The existing design of the wind catchers covers the transitional aspects of past and present. However, the future development of wind catcher design is still of great debate for academicians and researchers. It is due to the novice problem of high-level outdoor pollution, extreme challenges of indoor pollution, and the dynamic need of users for achieving personal comfort within the space. Also, there is a gap in utilizing wind catchers as a passive strategy while comparing Pakistan and the international context. The existing low-rise colonial buildings of Lahore have high-level ventilation strategies such as ventilators and wind catchers [26]/chimneys [27] to bring a high level of less polluted air to the interior and ventilate it within the buildings. Buildings such as the Governor House, The University of Punjab, the Old Campus, the Railway Barrack headquarter, and many other have wind chimneys that represent culture and are used to serve in both the climate of summer and winter [28]. Similarly, the wind catchers of Hyderabad have been well known for their unique character [29] (**Figures 1**–**4**).

The chapter is an attempt to explore the people's experience from a perspective of wind catcher revivalism. The academicians, scientists, or the public who have an interest in such ancient old tech have convinced people through various communication

Figure 1.
Wind chimneys of governor house [30].

Figure 2.
WCA of the University of Punjab old campus (authors source).

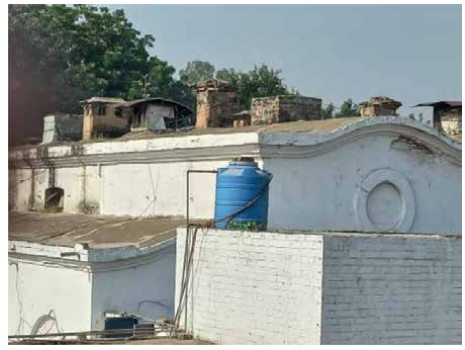


Figure 3.
WCA of railway Barrack Headquarters (authors source).

platforms. The blogs have been written by people from different cultures and are included within the research to cover the viewpoint of wind catcher origin, development, and challenges in various regions. This is to materialize the role of social networking platforms such as blogs and videos, whose obligational role is not clear. Blogs and videos are the most enriched sources that have the potential to analyze the sustainable contribution of wind catcher technology. The existing academic literature widely covers information regarding wind catcher development in which environmental and economic aspects are discussed in terms of eco-friendly, less intensive, low carbon footprint, passive design natural, free energy, and low cost highlighted [20, 22]. Still, the social factor concerning sustainability has not been touched so this chapter will

Figure 4.
WCA revival Hyderabad District administration office [31].

consider social opinion through qualitative analysis. Additionally, the content analysis will cover people's experiences and reveal a greater insight into wind catchers, the three-phase development of the Past, Present, and Future.

3. Methodology "Digital Ethnography"

Digital Ethnography (DE) is a method that shares the insights of people through various digital mediums to marginalize the voice of people [32]. DE is chosen to evaluate the existing blogs and videos, which have emerged as an expression for wind catchers in various regional contexts Existing blogs and videos specify the WCA development from classical to modern, and futuristic approaches in buildings for various regions including Pakistan. DE helps in synchronizing and analyzing WCA information reported by different bloggers. The DE was conducted with keyword searches such as 'wind catcher', 'scoops', 'WCA in Iran, Hyderabad, Pakistan', 'Monodraught', 'WCA technologies', 'WCA for thermal comfort', 'WCA types', and 'ventilation through WCA'. DE helps us to identify 33 blogs and 21 videos and transcripts from the search and scrutinize the relatable content in terms of replication and duplication. To extract meaningful information and trend spotting within the wind catcher, the scripts and transcripts were processed in the Nvivo version 11.

Figure 5 shows the five key step that has been applied to get the descriptive and analytical themes explored in terms of Past, Present, and Future. The raw data of measuring unit (a) consist of blogs and transcripts information, processed through Nvivo. The reference info is linked to themes and children's codes were developed as the text was coded accordingly and an auto summarizes theoretical framework was generated as a condensed meaning unit (b). The 19 children's codes are aggregated into 6 parental codes. The children's code of geography aggregated from (region, climate, history), IAQ (pollutants, standards, air change), thermal comfort (techniques, temperature, humidity), ventilation (ventilation type and standards), wind catcher type (classical, modern, reminisce), wind catcher (definition, types, characteristics, function). The coded sources help to extract information, analyze it, and categorized it in terms of past, present, and future intercessions. The different sections of the framework were coded again (c), and the information was grouped and categorized (d). Afterward, each section of summarized information was further grouped for manifest and latent analysis (e). A total of 1386 initial codes have been developed

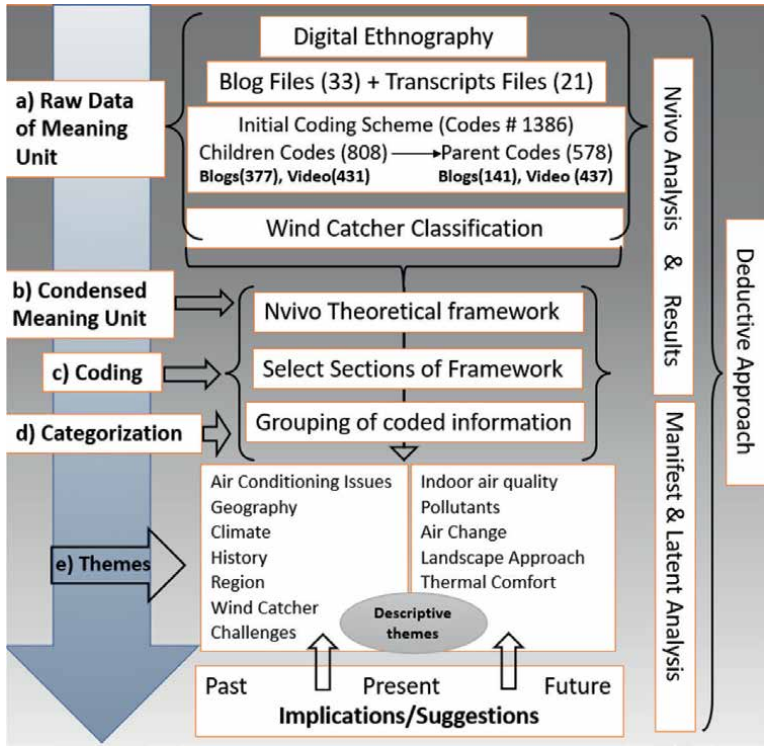


Figure 5.
Key steps of thematic analysis (adapted from [33, 34]).

No	Node classification	Number of nodes			
		Blogs	Videos	Total	Grand total
1	Parent	141	437	578	1386
2	Children	377	431	808	

Table 1.
Comparison of ethnographic nodes total, with blogs and videos.

as shown in **Table 1**. The codes and themes have been generated from the deductive approach to achieve more reliable results [27]. The manifest analysis was done while reading through the transcripts of videos and blogs whereas the latent analysis was performed to summarize them in three key themes Past, Present, and Future. As part of the manifest analysis, some original saying that reflects the essence of information and personal experiences of people have also been reported in the text directly [27]. The main themes have been ranked according to the level of Past initiatives, Present situations, and future scenarios, in line with the objective of the chapter.

Figure 6 shows a graphical distribution of various code references on the blog and video transcripts. The video content created the highest number of references in initial coding schemes. The regional and geographical characteristics identified the maximum number of references, followed by IAQ and thermal comfort, whereas landscape approaches and wind catcher challenges also significantly identified coded information from the blogs and video content analysis.

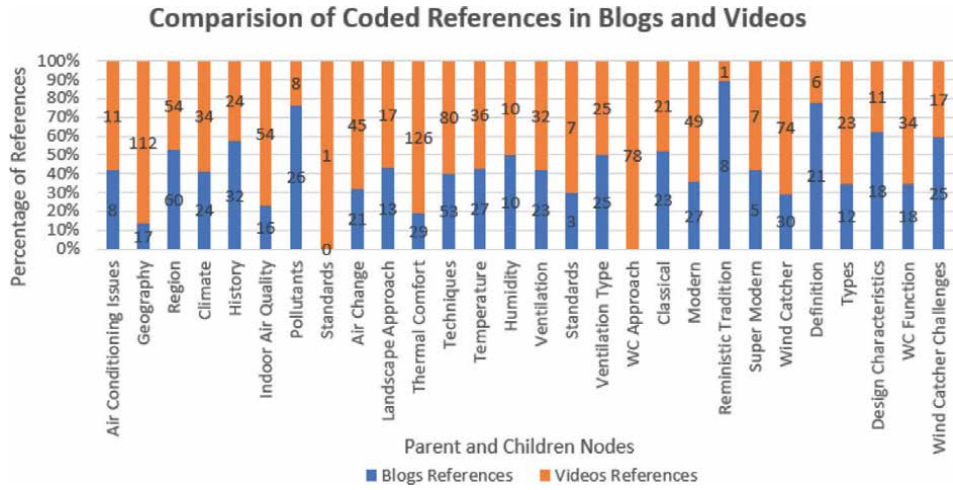


Figure 6.
Comparison of coded references in 54 sources.

4. Result and discussion on the themes

The following section will generate a discussion according to synthesized themes, namely, past, present, and future. This section reviews the initiatives that have been taken in the past, and potentially adapted to the present. It can suggest a way forward for the future application of wind catcher revival and further development in Lahore and Karachi, Pakistan. An article published by ArchDaily [35] shows an excellent transition of WCA design to adapt to different regions, and climates, and carry on the tradition from past to present and future.

4.1 The past initiatives

A book named "Architecture without Architects" was published by Bernard Rudofsky, in which the contribution of passive ventilation through various methods such as stack, and the chimney effect [36] have been highlighted. The wind catcher varies according to the different geographical conditions and is designed to suit climatic conditions. The past initiatives cover the aspects of geographical suitability, regionalism, climate design, and the historic development of WCA.

4.1.1 History

Wind catchers have been debatable about their origin. One continuation of such claim is from Persia, where archeologists have discovered some 4000 BC wind catcher, which resembles a chimney with no ashes in the interior. The other is from the paintings of Pharaoh Nebamun's residence, in Egypt in 1300 BC where the triangular structure proves its beginning in history (**Figure 7**). However, the traditions carried from the wind scoops of Iran almost around 2000 years ago, transferred to the nearby Gulf and Persian-influenced countries through the pearl trade route.

Arguably the Egyptian source is nontangible with speculation that only exists in drawings as inspiration from the nearby geographical site of Iran and Nasir Khusraw's famous Persian poetry of the 5th century. Also, the Persians led to the surviving

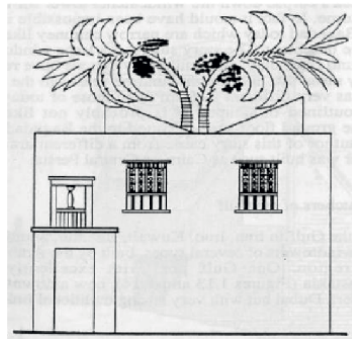


Figure 7.
WCA of pharaoh Nebamun's residence, Egypt [37].

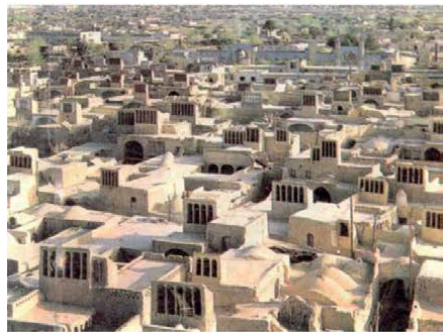


Figure 8.
WCA of Yazd City, Iran [18].

examples in the Yazd city of wind towers (**Figure 8**). Furthermore, according to Dr. Abdel Moniem El-Shorbagy, the Arab conquest of Iran in the 7th Century helped to spread WCA to the Middle East and South Asia. So, both arguments support Iran as the birthplace and the spread of wind catchers to nearby countries. In terms of WCA revivalism, Iran shares an 805 km long border with Pakistan, providing an opportunity to revisit the cultural traditions of wind catchers. As seen in the past the pearl route helped to extend the architectural tradition from one region to the other areas, so now today, it can inspire architects of Pakistan to adapt and merge the old tech of wind catchers within new buildings. The tradition of wind towers has also been revived within India so various regions of Pakistan can also take some lessons from the past and today's cultural adaptation to revive WCA in existing and newly constructed buildings.

4.1.2 Geography

Geographically WCA is suitable to low rise, less dense places with optimum wind speed in the regions. Other site conditions that are helpful for wind catchers to function are the best orientation, opening sizes, and solar protection. Yazd, the historic city of Iran known to us as the city of wind catchers have been declared a UNESCO World Heritage site in 2017 [38]. Another interesting dual tech of the old times was the use of WCA for air conditioning and refrigeration. They were used by the Persians to passively cool Khalistan palace, Tehran with water, wind, and desert ice.

In Sindh, Pakistan every house and many administrative buildings once have wind scoops. The Sindh scoops were unique in classification due to their shape and shutter function. Pakistani senior journalist and cultural analyst, Abid Ali Syed says "Photographs from the 1920s and 1930s of the Hyderabadi skylines dotted with windcatchers serve as an archetype of a communal, synchronous climate responsive effort" [39] (**Figure 11**).

Now-a-day they are found in geographical locations of the Middle East, Dubai, Kuwait, Qatar, Bahrain, Jorden, Iraq, Afghanistan, Egypt, Spain, Pakistan, the UK, and some windy regions of the US, and Canada such as Toronto and Ottawa (**Figure 9**).

The Zion National Park Visitor Center in Utah (USA) has wind towers for the hot dry climate that works in combination with evaporative cooling pads to cool interior spaces. The Wind tower of Torrent Research Center Ahmedabad, India designed on the principle of Passive Downdraught Evaporative Cooling (PDEC) with annual energy and cost savings of 64 and 36% respectively. The labs achieved a comfortable temperature of 27 and 29°C on the ground and first floor in comparison to 38°C outside temperature with an air change rate of 6–9 m^3/hr. The PDEC system was effective most of the time of the year except during monsoon season which was managed with a ceiling fan. The wind catcher and scoops of the UK are at the forefront of creating the most innovative and prefabricated design, with environmental consideration of energy efficiency and low carbon emissions (**Figure 10**).

4.1.3 Climate

Daniel A. Barber explains in his book "Modern Architecture and Climate: Design before Air Conditioning" about the role of climate adaptive strategies in regionalism and its reflection in modern architecture to replace HVAC [40].

Figure 9.
Wind catchers (WCA's) typology in various countries such as Iran [12], Egypt, Afghanistan [16], Malaysia [13], Canada, Qatar, Tehran, USA, India [14], Dubai [35] (start from the top left to right in all rows).

Figure 10.
Wind catchers (WCA's) variation in the UK [11, 24, 25].

Climate plays a significant role in passive ventilation, as it requires consistent wind speed and challenges of seasonal and variable wind direction during the day. Other important climate parameters are dry bulb temperature and humidity. So, a wind catcher is an ancient accomplishment of engineering that uses wind energy and has the potential to replace HVAC. WCA has been adapted to various climates and geographical locations according to environmental attributes. They have shown great potential in hot dry, hot humid, and temperate climates, where occupants need air movement to deal with the hot weather. Wind scoops also work efficiently in the hot dry wind region of the Midwest United States. Iranian wind towers are suitable for the hot desert climate.

Today buildings are classified in various climate zones and are designed accordingly. The wind velocity, direction, turbulence, surroundings, seasonal variation, and diurnal changes will develop the flow pattern. The wind is not only distributed horizontally but also circulated in the vertical spatial division, bringing less polluted and strong wind at the higher level. Similarly, the design of the wind tower inlet is opposed to the solar direction to minimize the heat. The WCA suitability in summer and winter is necessary for the adaptability of a passive design strategy. The role of climate is pertinent as it will bring comfort through air circulation within the interior.

4.1.4 Regionalism

Wind catchers are used as vernacular architecture in ancient Egypt, Babylonians, Persian, and Arabs. According to regions, their local name is Persian Badgir or Shish Khan, which serve as temperature regulators and ventilation devices. In the Sindhi language, they are known as the 'Manghan Jo Shahir' (City of Wind Catchers). But this claim is very limited because the same is known to us for the Iranian city of Yazd, which truly represents the ancient past, well preserved for today, and a great inspiration for the future. Like the Iranian context, where Persian poetry praises the

function, beauty, and social setting of WCA, the Sindhi Jiji also explains its social contextual use as a communication window (gossip) between two houses, to borrow and exchange items [41].

In an international context, WCA has been explored in various technical aspects of calculating wind dynamics from exterior to interior. But in Pakistan, they have not been acknowledged by the academic community except for a few architects Yasmeen Lari, Kaleemullah Lashari, and Anila Naeem have highlighted their importance in vernacular practices. The conservational drawing of WCA (Mangh) developed by Abdullah Qadir Baksh Shaikh conveys its use, esthetic, and social presence [41]. In ancient times, WCAs were present in Hirabad, Matiari, Halla, Sujawal, Thatta, Kotri, Gjaro, Jati, Gujo, and Bathoro to make use of rooftop ventilation.

The blogs also show the expression of people's love and intimacy about the use of ancient WCA. The blogs quote information from the elderly experience who have enjoyed the WCA cool breeze of the Indus, a sole air conditioning mechanism. The blogs also talk about the dilemma of eliminating the use of catchers in present times due to several reasons such as a power station being built in the city of Hyderabad. As time went on, people stop acknowledging the true essence of WCA's presence, and the lack of adaptability to newly raised problems and issues of climate change and air pollution. The old pictures (**Figure 11**) of the Hyderabad wind catcher shared through online social media platforms interestingly catch the eye of architects, historians, and environmentalists as free energy tech of ancient times that has great potential to convince stakeholders for the present and future.

> *"What I found was that windcatchers do still exist—even though they are very rare—and in my opinion, they are ready for a comeback." [31].*

> *"I read that windcatchers had been replaced by air conditioning, but surely something this widespread couldn't have completely disappeared in just a few decades, could it?" [31]*

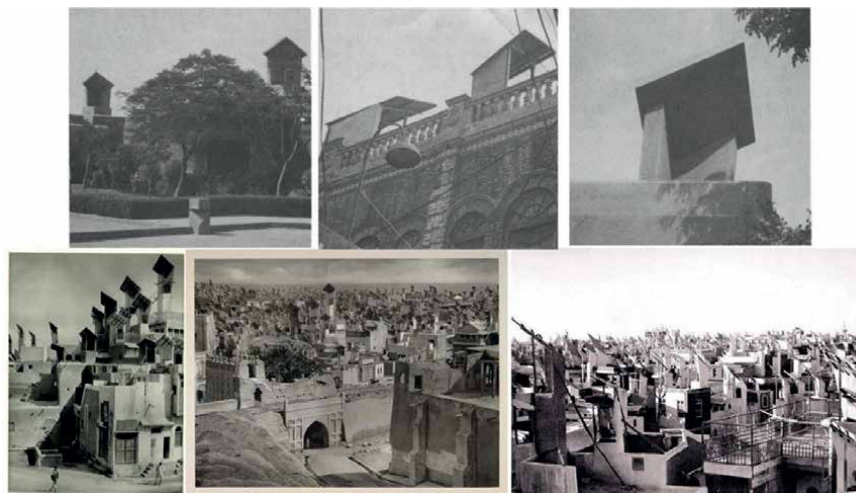


Figure 11.
Photo and video diary shows a collection of old pictures of Hyderabad WCAs from various social media platforms [17, 31, 41].

4.1.4.1 Implications

Wind Catchers were built with a sustainable approach, place-making, a reflection of social connectivity amongst people, and valuing climate design. They can be revived as a lost cultural heritage that represents symbolism due to their resemblance with Sindhi poetry, and a point of women's socialization. So, understanding the true social, environmental, and economic essence of old wind catcher design may help stakeholders to revive the tradition in various regions of Pakistan.

Dr. Susan Roaf [26] advocated the wind catcher's unique design in various regions including Iran and Pakistan and their relative adaptive measure to achieve increased comfort zone in naturally ventilated buildings of Lahore and Karachi that can be revived according to new needs. The high-level ventilation openings provide a solution to indoor air pollution. So, it is suggested that existing closed openings either be made functional again in terms of using it for ventilation or introducing a wind catcher.

4.2 The present situation

Buildings were built in the past and present to protect the people from the harsh climate. Today the WCA appears to be a successful adaptable tech that has great potential to resonate in many countries of the world. The contemporary architecture of Lahore and Karachi can be relooked at adapting existing designs such as prefabrication, solar-powered, and new WCA forms according to wind direction, and speed. The analysis also proves that Lahore and Karachi as metropolitan hubs provide huge potential to use commercial WCA and save energy, fewer GHG emissions, and greater carbon savings within the low-rise buildings. This will help to address the issue of climate change and the energy crisis. Architects and historians are more hopeful about the potential application of this old tech even today. In the present day, the maintenance and use of ancient wind catchers and towers are of great challenge. Along the side, their continuous use in rehabilitated and newly constructed commercial buildings is of great interest to Lahore and Karachi.

The wind catcher heads, openings, and columns are the different parts that functionally control the air quality too, and play a role in achieving comfort. In addition, the wind catcher is climatically controlled for varying wind directions with a rotatable head and personalized comfort within the room can be achieved. The IAQ can also be improved with the help of providing a solar chimney, another variation of stack ventilation within the building. In many places, wind catchers have been used in combination with other passive methods. So, in Lahore and Karachi, the same concept can be used with natural ventilation systems e.g., a combination of the clerestory, wind tower, zenithal openings, and wind exhausts will help to improve the IAQ. The wind catcher can be built with sustainable materials, thermal regulators such as brick, clay cover, wood, medium density board, or sandwiched insulation to provide a time lag between interior and exterior. The landscape design in connection with nature will bring a new life to indoor workplaces for a healthy environment. Amongst the common strategies of green building are the green roof and green facade that acts as a thermal regulator for building in many regions. So, it is suggested to provide wind catchers as an initiative of using in green approach in the recent and existing construction of Lahore and Karachi.

4.2.1 Air conditioning issues

The world population has risen to 9.7 billion with 68% urban migration and stakeholders are relying on HVAC causing the urban heat island effect. The human need for a climatically controlled atmosphere within the building makes us less adaptive to passive solutions and design strategies. The natural landscape is converted to construct the buildings, leading to heat accumulation and temperature rise in urban areas. İnternational Energy Agency (IEA) statistics for various countries have shown that there is an annual stock sale increase in the cooling consumption of both residential and commercial buildings [42]. Air conditioning has become one of the key components of a commercial building. The comfortable temperature in HVAC building range between 20 and 26°C rather than adaptable to a more flexible range of being adaptable on the wider temperature range. Environmental pollution has increased due to the release of various Noxious, Sulfur accumulation and other Green House Gases (GHG). The unsustainable practices of suggesting comfort based on air conditioning (AC) have created a dilemma for passive architecture. At one time the whole city skyline was filled with WCAs which are now replaced with rooftop split units and there will be a need for a system for replacing those AC along with its air handling units and pipes on large scale. These AC are expensive and unreliable due to grid electricity shortages in many developing countries. Building's cooling need requires greater dependence on electricity and HVAC technologies to manage the long duration of summer. The aftereffects of air conditioning pose serious environmental concerns to the people who work indoors and suffer from sick building syndrome.

4.2.2 Pollutants and air change

Various exterior and indoor sources significantly contribute to the level of indoor pollution such as CO_2, Volatile Organic Compound (VOC), which makes it difficult for people to breathe and affect their cognitive performance. The indoor environment is prone to emissions from indoor furnishings. As Martin W Liddament tells in his book A Guide to Energy Efficient Ventilation:

> *"Many systems operate in 'blending' mode to dilute pollutants, while others operate in 'displacement' mode to remove pollutants without mixing. The pollutants most often found in work and home environments are so-called VOCs, or "volatile organic compounds" [43].*

Carbon dioxide (CO_2)is a byproduct of human respiration and Indoor Air Quality (IAQ) can be improved with air change in a particular space through a wind catcher. Building requires thermal comfort as well as optimally good IAQ by reducing the level of CO_2 and maintaining internal temperature. Low carbon use within the room will reduce the level of CO_2 and help to achieve the required healthy and productive environment. Some countries are highly polluted and an additional layer of filter or screens in the inlet is required to clean the incoming air. According to Leonard Woolley, the wind catcher technology also advances in providing an air shaft to accelerate air within the building. The highly dusty zones also can be well treated with a tall wind catcher that brings cooler, stronger, and less dusty winds. The collected dust can be dumped at the bottom and can be further cleaned with meshing or indoor plants. Such a solution is highly suggestable in areas prone to insect-borne illnesses that require air filtration. The new Urban Development Company (EDU)

headquarters in Medellin, is built with a prefabricated solar chimney to replace cool air with warm air in the indoor workplace [44]. The Northern Link, Stockholm Sweden ventilation tower was constructed at the tunnel to tackle the highly polluted zones to divert pollution. Wind scoops are structures that are applicable in a dry but windy location with a minimum pollution rate. The availability of various filters in wind scoops also further clean the air and removes dust particles. There is a certain limitation with the design of existing scoops that rely on the outdoor air properties and in that case the outdoor air needs to process through a medium to achieve a significantly good level of ventilation.

4.2.3 Thermal comfort

Another noticeable feature of wind catcher buildings is thermal comfort, and its requirement depends on the climate condition of a particular area. "Pottinger wrote in 1815 and it's because the climate is so bad that to occupy buildings in that climate you have to have air movement for comfort" [45]. In dry conditions of hot-arid climates, adiabatic humidification will increase the moisture of the air to manage thermal comfort. This can be done with the help of evaporative cooling of sprayed pad system, tubes of lightweight fabric 1.4 meters in diameter, and a mist fan. The use of a ceiling fan will accelerate the process of natural ventilation and cooling process. The fan has a fog nozzle that produces a very fine mist, that helps to quickly evaporate the water and the air passes with high velocity at low temperature. Thermal comfort within the building is achieved with the help of wind pressure differences in a windy region, otherwise through temperature differences in less windy places. Comfort is achieved when air passes over the body and heat transfer between the body and the surrounding environment takes place with the help of convection, radiation, and conduction. At the same time, body tends to adapt to different personal factors in its natural environment. People of Tehran and Baghdad are comfortable at temperatures of 37 and 38°C in summer using various adaptive methods. The use of different mechanisms such as changing postures, open and close of opening depends on the seasonal requirement, and the use of blinds and curtains are chosen by people to keep themselves thermally safe, and neutral, and maintain a core body temperature. The groundwater heat exchanging pipes play a significant role in combination with solar chimneys and then channel within the room and air exhaust either to the other end of the tower or window. The interesting feature of WCA design is to bring air/wind directly to the place where occupants sit and can enjoy the breeze sometimes directly above it. The comfort in the WCA building can be controlled through materials like mud brick as an Egyptian architect Hassan Fathy talks about it. The material acts as a thermal insulator or thermal lag to protect against the unusual loss of heat. Persians also made Yakhchals through thermally sustainable mortar consisting of clay, lime, sand, egg whites goat hair, and ash. Similarly, the towers are being effectively used in combination with the radiant panels, Trombe wall, and solar heated system.

4.2.3.1 Implications

To celebrate the old traditional culture, and sensational space experience, the standalone wind catcher was built from recycled material at an exhibition and expos recently in Dubai [46, 47] (**Figures 12** and **13**). The site structure was objectively developed to gain people's confidence in the wind catcher tower, where they can experience wind ventilation. The use of local traditional materials, a climate-friendly

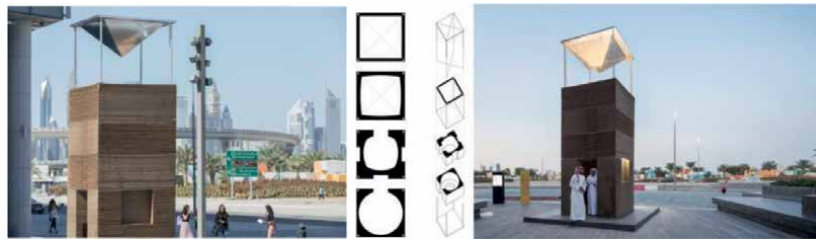


Figure 12.
Barjeel installation, Miskavi architecture studio [46].

Figure 13.
Wind scoop, Austrian pavilion [47].

design that projects energy saving and struggles for climate justice and a sustainable common future. Such initiatives can be taken even today to build wind catcher tower models, at various exhibition places in Lahore and Karachi. Even educational institutes can build a model as part of raising awareness amongst the education communities. This will help to familiarize people with the need and use of wind catchers in their specific climate context. This proposal can pave the way for climate-conscious design, a celebration of old cultural identity, inspiring people at large, and its implementation in future times.

The only wind catcher example of revivalism is the Hyderabad district administration's office (**Figure 4**) where architects are inspired by the old WCA traditions and want to revive them in commercial buildings. However, they can be made functional for climate-conscious design.

Wind catchers are predominantly used in the summer when more frequent air change is required. But their use in the winter season can also be suggested for air exchange on sunshine days. So, a wind catcher open and close pattern can be suggested to make it workable for all seasons.

4.3 The future scenario

Wind Catcher faces a lot of challenges regarding their development in various regions. Particularly, Lahore and Karachi are facing problems of pollution that require filtration of air in combination with evaporative or convective cooling in hot dry, and humid climates. Another biggest challenge is how they can be usable and adaptable to the changing need for human comfort and IAQ. Pakistan is a developing country where economic conditions are poor and building stakeholders have lost their confidence in the well-known passive design techniques. These cities experience long summer duration and high levels of polluted outdoor air quality in winter. The wind catcher revivalism should be done with state-of-the-art tech, employing green approaches in low-rise buildings.

4.3.1 Landscape approach

This section aims to look at the landscape-based micro-climate design for buildings. According to the World Economic Forum, the ancient wind catcher towers are a great inspiration to the Madrid outdoor wind garden to cool the city temperature by 4°C [48]. Another outdoor application of wind catcher in terms of landscape design is the spiral structure composed of ferns and mosses that catches the wind from the treetops/canopies and help to cool the nearby places. The most common methodology for building walls and roofs is green roofs and green walls. But the greenery also has some wind-friendly characteristics that attract or repel the wind for a cooling effect. For example, hedges, shrubs, and bushes reduce the air movement around the building and are suggested to be planted a minimum of 8 m away from the building. But the limitation changes for about 2 m on the leeward side of the building. Other cities such as Athens, and Bangkok have pocket parks and mangroves Eco-Park. The greenery not only cools the surrounding areas but also minimizes the level of surrounding pollution. There are ancient WCA where indoor plants along with mesh help to filter the clean air. However, the role of local and native plants is necessary that suit the climatic and geographical conditions of an area. The bio-climatic design of the green roof and facade acts as insulation for the city and encourages ventilation within and around the buildings. Farming Kindergarten and Vedana Restaurant, their native plants act as respiratory organs for air purification and maintaining a comfortable temperature for surroundings.

4.3.1.1 Implications

Presently, the blogs and videos do not discuss the immediate need and far-reaching impact of adopting the SDG 2030 agenda, for the design of passive buildings. This may be because of the reasons that such a platform is not aware of policymaking and driving a direct connection with the needful. But now and in the future to achieve the target set by sustainable communities and cities of Goal 11, the stakeholders will take into consideration the need for wind ventilation through wind catchers, increasing the impacts of a healthy environment within buildings. This will further help to bridge the gap of reducing indoor pollutants and sick building syndrome issues in line with the global agenda of SDG 2030.

The lack of landscape and scarce vegetation in the city of Hyderabad [49] also require espousing a vegetated wind catcher approach. This can be universally applied to all cities in the world that lack vegetation. In this way, it will help to balance the hard and landscape in terms of the built environment. The green vegetation approach needs to explore using numerical modeling in Computational Fluid Dynamics (CFD). The context or site-specific situation can be simulated for exploring the reduced impact of improving outdoor polluted air and circulation within the building. Another point of concern revealed in the qualitative analysis of sources is the selection of local vegetation.

Wind Catcher ventilation uses a sensational use of different senses that will give an enhanced indoor experience to the user. The WCA air can be felt on the skin in terms of thermal comfort, the indirect natural light can be treated for a visual connection with nature, and the aroma of air to remove the gaseous substance of various types also increases air quality and can be sensed through the nose. It will give an exciting experience of creating a quiet zone by making use of an acoustical design that is difficult to achieve in window ventilation. WCA design can provide personalized thermal, visual, and acoustical comfort to all users according to their dynamic needs.

5. The next step for wind catcher design

The WCA potentially suitable for future use in the buildings will have to face some contextual challenges that are highlighted through digital ethnographic analysis.

Amongst the most competitive passive design techniques, the wind catcher's potential for ventilation needs to be realized. In metropolitan cities of many countries, air pollution has been critical and surpassed the level set by WHO. Due to the introduction of air inside the building, it's become critical to bring polluted and non-treated air to the channel within the building. Sometimes stack Ventilation induces turbulence and fluctuation of wind inside the building, resulting in poor air movement. Wind Catcher arrangement is important, and flow needs to justify the fairer distribution of air inside. A common strategy is to place some of them in the wind direction and some places opposite. If the design of the wind catcher is not proper, it may cause a downdraft attack within the interior of the buildings. The airflow pattern and turbulence become critical in areas of a high and dense urban environment.

More recently, in some countries, the wind catchers have fallen, not maintained due to their non-usage in modern times. Yazd's City is a UNESCO heritage site because of its ancient, oldest known, and highest number of wind catchers, which survived today but losing their identity. Their existence as a historic piece, celebrating the regional architectural identity is more dominantly a driving factor. The wind catcher of Lahore and Karachi face the same situation of lost heritage and requires attention. It also challenges the maintenance of cultural identity by reducing the existing dichotomy between form and function.

6. Limitations of digital ethnographic studies

The study does not analyze finding from any WCA community on social networking sites such as Facebook, Instagram, and Twitter. However, people have uploaded some pictures on their accounts, followed by content sharing. Interestingly some images were found on architectural pages that support the vernacular architecture of Sindh, Pakistan. A few architects have also supported and advocated wind catcher images as part of a successful strategy in the past.

7. Conclusions

The research is an attempt to synthesize insights through blogs and videos. The content analysis of digital sources was accessed to determine the role of wind catchers as mediation and interposition of past, present, and future. It is hoped that findings from this study can inspire policymakers to revive the usage of wind catchers as a solution to Indoor Air Quality and Thermal Comfort in Pakistan. Both Karachi and Lahore are metropolitan cities with high populations, facing long hours of electricity shortages, and high levels of indoor/outdoor pollution. The recent design of wind catcher in various countries take air filtration into the consideration. The landscape design such as water bodies, moist mud, vegetation, and indoor air-purifying plants are the natural way of cleaning the air and achieving thermal comfort. The wind catcher can be revived in both regions of Lahore and Karachi on new lines of green catcher.

Acknowledgements

The authors acknowledge Monodraught Company for giving permission to use of their copyrighted pictures. We are also thankful to Mr. Khalid Mehmood Khan who helped in facilitating the communication channel for the field survey that helped the authors to take pictures for this book chapter.

Funding

This work was supported by Inisiatif Putra Siswazah grant ID No.: GP-IPS/2022/9736900 from Universiti Putra Malaysia Serdang Campus.

Conflict of interest

The authors declare no conflict of interest.

Acronyms and abbreviations

WCA	Wind catcher
SDGs	Sustainable development goals
DE	Digital ethnography
AC	Air conditioning
GHG	Green house gases
HVAC	Heating ventilation and air conditioning
CO_2	Carbon dioxide
IAQ	Indoor air quality
TC	Thermal comfort
UNESCO	United Nations Educational, Scientific and Cultural Organization

Author details

Asma Khalid* and Nur Dalilah Dahlan
Faculty of Design and Architecture, Department of Architecture, Universiti Putra Malaysia, Serdang, Selangor, Malaysia

*Address all correspondence to: gs62728@student.upm.edu.my

References

[1] United Nations. Cities—United Nations Sustainable Development Action 2015. 2015. Available from: https://www.un.org/sustainabledevelopment/cities/ [Accessed: December 7, 2022]

[2] IQ Air. 2 | 2021 World Air Quality Report, Region and City PM 2.5 ranking. 2020. Available from: https://www.iqair.com/world-most-polluted-cities [Accessed: December 7, 2022]

[3] WHO. Ambient (outdoor) air pollution, World Health Organization. Available from: https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health [Accessed: November 14, 2021]

[4] Purohit P, Munir T, Rafaj P. Scenario analysis of strategies to control air pollution in Pakistan. Journal of Integrative Environmental Sciences. 2013;**10**(2):77-91. DOI: 10.1080/1943815X.2013.782877

[5] Hashemi F, Passe U. Climate and occupancy based investigation of air pollutants in office spaces. In: IOP Conference Series: Materials Science and Engineering. 2019;**609**(4):1-6. DOI: 10.1088/1757-899X/609/4/042052

[6] Mannan M, Al-Ghamdi SG. Indoor air quality in buildings: A comprehensive review on the factors influencing air pollution in residential and commercial structure. International Journal of Environmental Research and Public Health. 2021;**18**(6):1-24. DOI: 10.3390/ijerph18063276

[7] Lodhi K. An Investigation into HVAC Option for an Office Building in Pakistan. United Kingdom: University of London, University College London; 2005. DOI: U594119

[8] Colbeck I, Nasir ZA, Ali Z. The state of ambient air quality in Pakistan-a review. Environmental Science and Pollution Research. 2010;**17**(1):49-63. DOI: 10.1007/s11356-009-0217-2

[9] Noureen H. Solutions for Energy Crisis in Pakistan. Islamabad; 2014. p. 297. Available from: https://www.csspmspk.com/wp-content/uploads/wpforo/default_attachments/1624592224-Energy-Crisis-in-Pakistan-complete-document.pdf#page=244

[10] Li W, Wei C, Wang X, Chan TO, Liu K. Segmentation of Closely Packed buildings from Airborne Lidar Point Clouds. 2020. Available from: https://www.researchgate.net/publication/340600496

[11] Elmualim AA, Awbi HB. Post occupancy evaluation of a building employing windcatchers for summer ventilation. Facilities. 2003;**21**:323-332. DOI: 10.1108/02632770310507980

[12] Rafooneh Mokhtarshahi Sani and Payam Mahasti Shotorbani. Symbolic use of wind-catchers in Iran. Open House International. 2013;**38**(2):76-87

[13] Haw LC, Saadatian O, Sulaiman MY, Mat S, Sopian K. Empirical study of a wind-induced natural ventilation tower under hot and humid climatic conditions. Energy and Buildings. 2012;**52**:28-38. DOI: 10.1016/j.enbuild.2012.05.016

[14] Ford B. Passive downdraught evaporative cooling: Principles and practice. Arq: Architectural Research Quarterly. 2001;**5**(3):271-280. DOI: 10.1017/S1359135501001312

[15] Kassir RM. Passive downdraught evaporative cooling wind-towers:

A case study using simulation with field-corroborated results. Building Services Engineering Research and Technology. 2016;**37**(1):103-120. DOI: 10.1177/0143624415603281

[16] Dehghani-Sanij AR, Soltani M, Raahemifar K. A new design of wind tower for passive ventilation in buildings to reduce energy consumption in windy regions. Renewable and Sustainable Energy Reviews. 2015;**42**:182-195. DOI: 10.1016/j.rser.2014.10.018

[17] Lari Y. Traditional Architecture of Thatta. Karachi: Heritage Foundation; 1989

[18] Bahadori MN, Dehghani-sanij A, Sayigh A. Wind Towers. Switzerland: Springer International Publishing; 2014. DOI: 10.1007/978-3-319-05876-4

[19] de Oliveira CC, Rupp RF, Ghisi E. Influence of environmental variables on thermal comfort and air quality perception in office buildings in the humid subtropical climate zone of Brazil. Energy and Buildings. 2021;**243**:110982. DOI: 10.1016/j.enbuild.2021.110982

[20] Nejat P, Salim Ferwati M, Calautit J, Ghahramani A, Sheikhshahrokhdehkordi M. Passive cooling and natural ventilation by the windcatcher (Badgir): An experimental and simulation study of indoor air quality, thermal comfort and passive cooling power. Journal of Building Engineering. 2021;**41**(March):102436. DOI: 10.1016/j.jobe.2021.102436

[21] Yang F, Liu C, Qian H. Comparison of indoor and outdoor oxidative potential of PM2.5: Pollution levels, temporal patterns, and key constituents. Environment International. 2021;**155**:106684. DOI: 10.1016/j.envint.2021.106684

[22] Obeidat B, Kamal H, Almalkawi A. CFD analysis of an innovative wind tower design with wind-inducing natural ventilation technique for arid climatic conditions. Journal of Ecological Engineering. 2021;**22**(2):86-97. DOI: 10.12911/22998993/130894

[23] Sakhri N et al. Investigation of the natural ventilation of wind catchers with different geometries in arid region houses. Journal of Mechanical Engineering and Sciences. 2020;**14**(3):7109-7124. DOI: 10.15282/jmes.14.3.2020.12.0557

[24] Monodraught UK, Monodraught. 2020. Available from: https://www.monodraught.com/ [Accessed: December 4, 2022]

[25] Monodraught. Marketing Team Monodraught—YouTube, WINDCATCHER® X-air Natural Ventilation, 2010. Available from: https://www.youtube.com/channel/UCu0reh-oOGg7GOZ4fKmMRtQ [Accessed: December 8, 2022]

[26] Dr Susan Roaf. 'The Amazing Windcatchers of Yazd'—YouTube. The IHF (Iran Heritage Foundation). 2020. AVailable from: https://www.youtube.com/watch?v=b2aC6gnJT2w [Accessed: December 8, 2022]

[27] Rehman R, Almas R, Naz N, Khan MA, Gber A. Basil Martin Sullivan: Architectural Contributions of a Legendary British Architect of Colonial Lahore. GBER, UK, vol. 8, pp. 2-22

[28] Khan MA, Rehman A. Architectural Analysis of British Colonial Railway Residential Buildings in Lahore, Lahore; 2013

[29] Roesler S. Allegory of the Sustainable City, the wind catchers of Hyderabad (Pakistan) and their spread in the modern architectural discourse. In: Hildebrand S, Mondini D, Grignolo R, editors. Italiana: Mendrisio Academy Press; 2018;**4**:127-139

[30] DAWN.COM. PM Imran Khan orders demolition of walls of Punjab Governor House - Pakistan. 2018. Available from: https://www.dawn.com/news/1448811 [Accessed: December 31, 2022]

[31] Erika Alatalo. Searching for Windcatchers in Hyderabad—Field Study of the World. 2016. Available from: https://www.fieldstudyoftheworld.com/searching-windcatchers-hyderabad/ [Accessed: December 3, 2022]

[32] Murthy D. Digital ethnography: An examination of the use of new Technologies for Social Research. Sociology. 2008;**42**(5):837-855

[33] Erlingsson C, Brysiewicz P. A hands-on guide to doing content analysis. African Journal of Emergency Medicine. 2017;7(3):93-99. DOI: 10.1016/j.afjem.2017.08.001

[34] Bengtsson M. How to plan and perform a qualitative study using content analysis. NursingPlus Open. 2016;**2**:8-14. DOI: 10.1016/j.npls.2016.01.001

[35] Stouhi D. What is a Traditional Windcatcher? ArchDaily; 2018. Available from: https://www.archdaily.com/971216/what-is-a-traditional-windcatcher [Accessed: December 9, 2022]

[36] Rudofsky B. Architecture without architects: A short introduction to non-pedigreed architecture. Art Education. 1970;**23**(7):113-115. DOI: 10.2307/3191516

[37] Roaf S. Passive and Low Energy Cooling 1053 for the Built Environment. 2005. Available from: https://www.researchgate.net/publication/237768160

[38] UNESCO. Historic City of Yazd—UNESCO World Heritage Centre; UNESCO World Heritage Centre. 2017. Available from: https://whc.unesco.org/en/list/1544 [Accessed: November 28, 2022]

[39] Minelleal. Windcatcher—Passive cooling and cultural identity—Local Code. Digital Design Journal. 17 Mar 2017. Available from: http://localcode.org/2017/03/windcatcher-passive-cooling-and-cultural-identity/ [Accessed: December 03, 2022]

[40] Brainard G. Modern Architecture and Climate: Design before Air Conditioning. United States: Princeton University Press; 2022;**6**. DOI: 10.1080/24751448.2022.2040309

[41] Junejo Z. Back to the basics: Wind catchers of Hyderabad—The Friday times—Naya Daur. Features. 2021. Available from: https://www.thefridaytimes.com/2021/07/24/back-to-the-basics-wind-catchers-of-hyderabad/ [Accessed: December 3, 2022]

[42] Buildings—Analysis—IEA. Available from: https://www.iea.org/reports/buildings [Accessed: December 9, 2022]

[43] Martin W. Liddament, A Guide to Energy Efficient Ventilation. 1996

[44] Cross Ventilation, the Chimney Effect and Other Concepts of Natural Ventilation | ArchDaily. Available from: https://www.archdaily.com/887460/cross-ventilation-the-chimney-effect-and-other-concepts-of-natural-ventilation [Accessed: January 1, 2023]

[45] MINELLEAL. Windcatcher—Passive cooling and cultural identity—Local Code. 2017. Available from: http://localcode.org/2017/03/windcatcher-passive-cooling-and-cultural-identity/ [Accessed: December 3, 2022]

[46] ArchDaily. Barjeel installation / Miskavi architecture studio | ArchDaily. Curated by Paula Pintos. 2019. Available from: https://www.archdaily.

com/928454/barjeel-installation-miskavi-architecture-studio [Accessed: December 3, 2022]

[47] Sahar Ejaz. Expo 2020 Dubai: A look inside the wordless Austria Pavilion | Expo2020-pavilions—Gulf News. 2021. Available from: https://gulfnews.com/expo-2020/pavilions/expo-2020-dubai-a-look-inside-the-wordless-austria-pavilion-1.1634050792620?slide=1 [Accessed: December 3, 2022]

[48] Madrid's 'Wind Garden' Will Cool City By 4 Degrees | World Economic Forum. Available from: https://www.weforum.org/videos/madrids-wind-garden-will-cool-city-by-4-degrees [Accessed: December 9, 2022]

[49] Khaskheli J. Catching wind. International the News. 2016. Available from: https://www.thenews.com.pk/magazine/you/132621-Catching-wind [Accessed: December 3, 2022]

Chapter 10

Fractal Dimension and Perception of Order in Islamic Art

Nurfer Tercan

Abstract

In this article, I aim to draw attention to how human beings' innate emotional closeness, connectional integrity, and creation feature toward other living things and the causality of coexistence are interpreted in the triad of mind, philosophy, and architecture. Esthetic appreciation for nature is one of the essential human tendencies, and it is biologically encoded in the human structure. The primary function of the structures of nature to create an esthetic effect in man is the maintenance of life. In addition to the geometric properties of biological forms, such as fractal formation and scale invariance, symmetry, self-similarity, and complex hierarchy, indirectly relate humans to patterns and properties of natural elements. The relationship between people and places is manifested not in spatial distinctions but in the transition between perspectives. In this article, I argue that the architectural, philosophical, and artistic triad of the Alhambra Palace is a magnificent labor that can correspond to the concepts of connective totality, biophilia, and fractal.

Keywords: Islamic art, biophilia, fractal, geometric synthesis, philosophy of mind, cognitive science, perception

1. Introduction

As a result of the interaction and transformation of cultural dynamics, each period shapes its own ecology. The human brain, which can develop thoughts, emotions, and behaviors, has a unique connectivity with its originality, creativity, imagination, the potential to transform itself with each new learning, and the ability to create a communication network and pattern. The authoritative communication language of society can be defined as life. Philosophy, art, architecture, and science understand this language and discover new truths from experiences to be articulated on old truths, give meaning to lives and new "more truths." The interconnectedness network of life, which consists of information, is modeled in the human mind with philosophy, art, architecture, and science. That area of the network of existence is again "created" through specified experiences with the premise of philosophy, art, architecture, and science. When we examine the existence of nature, from the veining structure of a leaf to the folds where streams meet and separate, from the images created by the lightning to the elegant patterns produced by the flowers in an artistic manner; we encounter various occurrences or actions, from the intricate form of mountains to the behavior of nonlinear weather conditions that we cannot precisely predict. When we

pay attention to this production language witnessed by human beings, we can analyze how a process consisting of a few simple steps turns into magnificent formations when repeated, no matter how complex it may seem. The presence and richness of fractality in the forms produced by nature and observed behaviors draw attention. Connectivity is also hidden in geometry. Geometry maps are translated as measurements of the earth or earthly measurements. Geometry reveals parts of all forms of the part's relation to the whole and the structure. Geometry, which forms the basis of the original structure of everything that exists, is a constant reminder to us of the sacredness of the relationship with the whole, its interconnectedness in the universe, and its constant interaction with the networks it sees with everything. Natural analogs deal with the organic, inanimate, and indirect connotations of nature. Living things, materials, colors, shapes, sequences, and patterns found in nature; In the built environment, it manifests itself as a work of art, ornament, furniture, decor, and weaving. Imitating flower and leaf patterns, choosing colors in the natural environment, or organically designed furniture provides an indirect connection with nature.

Man is a part of nature and is materially dependent on nature in terms of resources such as food, clothing, and medicine to maintain his life. Apart from this, nature is essential in terms of its effects on human beings' emotional, cognitive, esthetic, and spiritual development. In theory and practice, a person's physical, mental, and spiritual health depend on the quality and continuity of the interaction with the natural environment. This interaction increases the potential for a safe and fulfilling life. Man's dependence on natural resources, satisfaction from interaction with nature, the development of exploration and skills, the effect of the physical appearance of nature on peace and inspiration, and emotional bonds with plants and animals have been studied in different subjects. The actual discovery area of humanity is life on earth and the transfer of related information to science, art, and daily life. Human beings' ties to the rest of life are poorly understood and need new scientific research and bold esthetic interpretations. It is necessary to develop an intellectually more substantial and persuasive environmental ethic.

The symbolic experience of nature refers to the use of nature to facilitate communication and thought. Man's mental and physical evolution has taken place together with environmental features such as light, sound, smell, wind, water, plants, and animals. The use of symbols related to nature showed itself in the development of spoken language. Problem-solving, critical thinking, and manual skills have emerged from centuries of interaction with nature. His closeness to natural elements is biologically coded into the human structure. It is known that animal and plant representations observed in historical buildings and places have long been used in architecture for decorative and symbolic decorations. The consistency of these natural themes, applied differently in each period, shows that biophilic design is not new. Instead, history supports that connection with nature is vital for modern humans as an urban species to maintain a healthy and vibrant existence.

Biophilia and biophilic design emphasize that physical and mental well-being depends, beyond us, on the quality of our relationships with nature, of which humans are ecologically a part. The biophilic design approach is shaped on the basis that people feel better in environments with sunlight, animals, trees, flowers, running water, birds, and natural processes. In buildings that have survived from ancient times, the concept of design connected with nature in a continuous state shows that although the biophilia hypothesis is a modern concept, it is not a new point of view. Communities in the past, which built shelters from local materials, have historically revealed their structures through biological orientations and spatial arrangement processes of their

immediate environment and minds. Using what they had for shelter, protection, and worship, they instinctively built structures that provided the knowledge, form, and meaning their sense of well-being required. Therefore, design decisions have been realized as a natural extension of the neurological processes that make humans alive and human. The design framework of modern architecture has yet to develop in a way that includes nature and requires a relationship with the environment. However, current evaluations of historical buildings show that people perceived healing qualities better in the past and included them in their immediate surroundings.

Since the periods of urbanization activities, they have built their shelters with biological guidance, and applications, such as gardens, courtyards, atriums, and inner gardens, have been made in all societies, and contact with nature has been achieved. Humanity, whose relationship with nature is based on existence, attributed holiness to these gardens by developing mythological and religious events in connection with nature. In Islamic civilization, courtyard design, which connects with nature and privacy in civil and public buildings, has been the most critical element determining the development of Islamic architecture and cities. The garden of a surreal palace depicted in Tales of One Thousand and One Nights, which is described as one of the seven wonders of the world, is the most important example of which the healing, purifying, and spiritualizing effect of nature has been proven in ancient communities where water plays with various plants and trees were masterfully constructed. The Palace, an excellent source of pride for all Islamic art and Andalusian architecture, is the Palace of Alhambra (Kasrü'l-hamrâ). The building, built for military use by the Andalusian Umayyads on a hill overlooking the rivers in Granada, Spain, in the ninth century, was expanded with towers, interconnected rooms, courtyards, and courtyard gardens transformed into a magnificent design. The Alhambra palace, which means "red" in Arabic and takes its name from the unique red clay soil of the geography, is a magnificent yet modest architectural design of the thirteenth century Andalusian period.

2. Approach to philosophy of mind with architectural concepts of biophilia and fractal geometry

It has been understood that especially the ornamental elements in the spaces constructed in connection with nature are geometric compositions that directly affect the nervous system. Traditional motifs, colors, articulated surfaces, and spatial formation emphasize design in connection with nature [1].

The dialog between architectural spaces, shaped as the composition of natural forms and patterns, and human beings' innate commitments has been manifested in traditional architecture. Specific strategies for establishing this dialog include direct access to daylight, fresh air, plants, and green spaces [2]. The use of atrium and peristyle in Greek architecture was seen as the most appropriate method for incorporating light and nature into the building to create a qualified living space and incorporate natural elements into the plan of the building. A similar point of view is also seen in traditional buildings in Islamic architecture, where courtyard systems and cloistered corridors are used. The courtyard system, used in different forms in public and civil architecture, serves as a garden from nature by providing a central gathering area for the surrounding rooms, natural ventilation, daylighting, and planting [3].

It is possible to define the charm in traditional architecture as organic, lively, whole, comfortable, accessible, egoless, confident, and mostly "eternal" qualities that

can also be defined as biophilic values. Because of these qualities, it reflects the feelings of infinity and is called "timeless architecture." Christopher Alexander states that historic buildings are a timeless way of building and defines *timeless architecture* as spaces that give a feeling of comfort rather than restlessness since there are no internal contradictions incompatible with human nature [4].

He describes it as a timeless experience where individuals who experience these structures feel comfortable and live in harmony with themselves and without stress. The proportion and geometry in these buildings are associated with the scale of the building components and their positioning concerning the surrounding structures because one of the basic principles of timeless spaces is their positioning and shaping according to the built environment in which they are located [5]. It is thought to have physiological and psychological effects on humans due to the flawless processing of sacred geometric principles and their construction as a harmonious built environment for living [6]. The composition of fractal forms with natural textures and colors in the editing of cognizant natural images in the built environment is defined as the biophilic approach. In the discussion of healing space, there are also opinions that the biophilic design presented by the architects to the users is not real nature and will have a different effect. However, experimental studies have shown that the human mind interacts with nature indirectly and has similar effects with being in nature when in contact with distinctive forms and surfaces. The natural environment and the built environment, including natural forms, details, hierarchical division, fractal patterns, and colors, help elicit innate responses and trigger a sense of well-being.

Physical and biological sciences have utilized fractal geometry seen in ornaments since antiquity to model historical and mythological accurate, symbolic events and geometric compositions of the period. Fractal geometry was later used to establish the link between art and nature, serving esthetic concerns, so researchers determined that fractal patterns were linked with local vegetation [7]. In this context, recent studies have proven that fractal patterns and multidimensionality in spaces affect the parasympathetic nervous system and provide an impulse to relax and calm down [8]. It has been understood that the ornamental elements in the spaces constructed in connection with nature are geometric compositions that directly affect the nervous system. Traditional motifs, colors, articulated surfaces, and spatial formation emphasize design in connection with nature [1].

In historical, sacred, and secular spaces that integrate the logic of natural life into the built environment, bring the language of "life" to the spaces and thus provide neurological nourishment to the users, the mental and physical arousal experiences that people experience at a high level stemming from this visual/mental discourse, nowadays called biophilic design, but the architecture of architecture. Shows that the "healing architecture" attitude, which has been effective since its existence, is related to the qualities it provides to the building.

The building form of the madrasahs with courtyards, where both theoretical and practical training were held, developed over time and characterized by the use of water, shadow, daylight, color, texture, and the effect of environmental forces, dominated by square and rectangular geometry with iwans on four directions, the courtyard surrounded by a portico. Despite the sculptural stance of Western architecture, the harmonious integration of the exterior and interior spaces of traditional Islamic madrasas with natural elements and the harmonious use of natural materials and geometric forms in the building is referred to as nature-friendly designs in the field of today's architecture [9].

Human-centered ethics (anthropocentric), which is one of the three basic environmental and ethical approaches in explaining the relationship between humans and nature, is an approach that respects nature as long as it has been beneficial to humans since the ancient Greek period and is based on the domination of society over nature and argues that economic developments are the primary condition for human well-being. The second basic approach, biocentric ethics, accepts that other living beings other than humans have intrinsic value and argues that humans are in an equal position to all other living things. It is necessary to create an ecological citizenship model to minimize the damage to the natural environment through sustainable living and conscious consumption of natural resources. Accepting nature as a living organism, instead of the mechanical universe view that formed the foundations of science in the seventeenth century, will enable us to understand nature and accept it as a living entity. It is necessary to accept the existence of technology and industry and develop new approaches according to this reality to create and develop environmental awareness in humans, who are the biggest consumers of nature. Rapid economic and technological developments have caused irreversible damage to the ecosystem, and at this point, people have found the solution to seek ideal living spaces outside the world. However, the perfect balance and limitless possibilities the world offers for life have yet to be found anywhere else in the universe. In this context, the solution to ecological problems is to question our wrong relations with nature for centuries and to adopt and implement the understanding of development in harmony with nature.

The word biophilia, which is a combination of the words "bio" meaning life, and "philia" meaning sincere love-liking, means the instinctive love of all people for life and things related to life. The term "biophilia" literally means "love of life or living systems." It was first used by Erich Fromm to describe a psychological orientation of being attracted to all that is alive and vital. Erich Fromm, who said there is an innate connection between the human self and other living things, used the concept of "biophilia" for the first time in 1964 as the opposite of necrophilia. He argued that being affected by vital things related to life and death is a psychological obsession and defined biophilia as "excessive curiosity and attraction to everything alive" [10]. Wilson defined the concept of biophilia as an innate tendency to focus on life and vital processes. He suggested that we value nature and ourselves more as we understand other living organisms. In the same book, Wilson stated that man's tendency to relate to life and natural processes could express a biological need, including the desire to connect with life. Therefore, he argued that this need for nature is necessary for physical and mental growth in the developmental process. Further, Wilson argues that the biophilia hypothesis reveals human dependence on nature, whose ties extend far beyond simple matters of material and physical lateness and the craving for esthetic, intellectual, cognitive, and even spiritual meaning and fulfillment. Thus, it is inevitable for them to prefer parks, zoos, and environments where they can come into contact with water, with the idea of an uncertain future, in artificial environments offered by technology [11]. People connect with nature through emotions, such as curiosity, dominance, discovery, and fear. In their book The Biophilia Hypothesis (1993), Wilson and Kellert presented evidence confirming and opposing biophilia, explaining how these tendencies developed during the evolutionary process and why they are still evident in the modern age.

The universe is 2-dimensional and is perceived as 3-dimensional by the software of the brain. The language of the Hologram Universe is mathematics/geometry. Endless patterns transform each other from shape to shape; the pattern in the smallest ring is also evident in the largest; Everything is intertwined and connected. The

knowledge that we live in a simulation is widely spoken about today and is scientifically proven day by day. In other words, life consists of the projection of our brain, and our brain consists of software that is the mathematical product of the universal program [12]. Different forms of biophilia are best seen in crops in the process of biocultural evolution. Intrinsic tendencies are shaped by the guiding influence of learning, culture, and experience. Biologically based, the tendency to associate with nature, behavior includes thoughts and feelings. It is a pattern of beliefs and tendencies toward nature, each reflecting human values and expressions. These tendencies manifest themselves directly or indirectly. They manifest themselves in human products, in manifest or hidden states of experience and understanding. In terms of content, intensity, and orientation, the role of society is enormous in the tendency to relate to nature. Various forms of biophilia are found deep within our biology and can be shaped by individual experience and cultural influences, not simply by reducing them to instinctive tendencies.

Man's mental and physical evolution has taken place together with environmental features such as light, sound, smell, wind, water, plants, and animals. Problem-solving, critical thinking, and manual skills have emerged from centuries of interaction with nature. The closeness of man to natural elements is biologically coded into the structure of man. According to Kellert, people's emotional, physical, and mental health and productivity today depend on their close relationships with nature. For this reason, it has been considered essential to examine how to maintain this relationship in the modern built environment and put it into practice. In the book, Biophilic Design, academic and scientific studies were compiled under the direction of Stephen Kellert.

3. Scientific research reveals how our environment affects the mind

Due to the basic need for shelter, a human cannot be thought of independently of the place and is constantly interacting with the environment in which he is physically and spiritually as an inseparable whole [13]. Undoubtedly, the alienation of people from nature began with the fact that they built cities to live in communities by adopting a settled life. The city-human relationship has reached the breaking point, especially with the industrial revolution. Since the adverse effects of urbanization on human health are a common problem, research from many branches of science has focused on this issue. "Ecopsychology," which means ecological psychology, was popularized by historian Theodore Roszak in 1992 and explored the relationship between human behavior and the environment [14]. Ecopsychology examines the relationship between psychology and behavior in daily life practices and their environment. As a continuation of the Age of Enlightenment understanding, the field of architecture, which developed with the perspective of man's sovereign authority over nature, has built cities, which are today's living spaces, by ignoring the human-environment bond in the design processes. These studies, which seem to have achieved successful results, in theory, have created ecologically insensitive and unhealthy spaces where sociability is minimized in practical life. Ecopsychology, which examines the way people perceive their environment in daily life, and their interaction with the built and nature, says that the inclusion of social, cultural, and natural dimensions in the built environment is an important element [15].

Most of the research on the relationship between man and his environment has focused on cities that have turned into unhealthy spaces as an inevitable fact of

our lives. In 1994, Rodhe and Kendle examined the positive effects of urban and green spaces on human psychology under five headings: emotional, cognitive, developmental, behavioral, and social; It reduces people's stress and mental fatigue, improves their mental abilities, especially in children, strengthens their sense of self-confidence by balancing different emotional states, and positively affects human health by increasing socialization and communication [16]. Ulrich (1993) stated that the stress responses of individuals who are accustomed to living only in an urban environment without being exposed to the natural environment cause some cognitive losses. Unlike the life of ancient people, in urban environments where there are no physiological stimulants and no struggle for survival, mental stressors cause anxiety, and this becomes a cycle in the absence of positive and negative natural stimuli in urban life [17].

In addition to urban open spaces, the use of natural elements in closed spaces where people are in constant contact is also an important factor affecting human health, well-being, and productivity. Biophilia, sustainability, ecopsychology, and other research on the human-nature connection suggest that the human species respond positively to the forms, processes, and patterns that include nature. In this context, Heerwagen (2009) argues that in increasing the health and well-being of the spaces designed by using the knowledge of our inclination toward nature, working environments connected with nature will become both more productive and comfortable, homes will become more harmonious and livable with human nature, and public spaces will become more inclusive spaces [18].

4. Biophilic design parameters

After the biophilic design studies, the researchers focused on some design parameters for the applicability of the specified biophilic elements. In light of Appleton's (1975) studies [19], listed physical elements and spatial features in preferred natural environments as mystery, danger, shelter and surveillance, confusion, and order [20] (**Table 1**).

Heerwagen and Hase (2001) articulated that with the increase in knowledge and experience about the usability of nature's principles in architecture and urban design, the characteristics that determine the quality and quantity of biophilic structures will expand.

With the development of computer technologies, the algorithms of the forms in nature are reproduced with numerous iterations and the fractal pattern of the form is modeled. Various fractal production methods are used in different disciplines such as architecture, medicine, design, digital installation, cinema, and animation. However, when the works of art of the past, intricate reliefs used by abstract geometric patterns, tile ceramics, woodwork, plaster ornaments, and marble columns are examined through computer programs, it is observed that they contain high mathematics, algorithm, symmetry, and geometry knowledge far beyond their period. The fractality of the esthetic language of nature draws attention to the patterns that are still not fully understood, deeply admired, and in forms with esthetic value. Behind the fractality produced by the knowledge of higher mathematics in the work of art, from form to essence, is a system of thought, an expression that leads from matter to meaning. Each work is a part of the cultural climate it is in and is a reflection of the artist's world of thought. When higher mathematics knowledge turns into an artistic style, it interprets the universe's existence from part to whole in the world of thought.

Key dimension	Attributes and qualities
Prospect (ability to see into the distance)	Brightness in the field of view (windows, bright walls) Visual distance Ability to get to a distant point for a better view Horizon/sky imagery (sun, distant mountains, clouds) Strategic viewing locations View corridors
Refuge (sense of enclosure or shelter)	Canopy effect (lowered ceilings, screening, branch-like forms overhead) Variation in light levels (darkness suggests refuge) Enclosing surfaces (walls, partitions, screens) Penetrable barriers and surfaces for views out
Water (indoors or in view)	Glimmering or reflective surface (suggests clean water) Moving water (also suggests clean, aerated water) Symbolic forms of water
Biodiversity	Varied vegetation indoors and out (large trees, plants, flowers) Windows designed and placed to incorporate nature views Outdoor natural areas with rich vegetation and animals
Sensory variability	Changes and variability in environmental color, temperature, air movement, textures, and light over time and space
Biomimicry	Design derived from nature Use of natural patterns, forms and textures Fractal characteristics (self-similarity at different levels of scale with random variation in key features, rather than exact repetition)
A sense of playfulness	Incorporation of decor, artifacts, objects, and spaces whose primary purpose is to delight, surprise, and amuse
Enticement	Discovered complexity Information richness that encourages exploration curvilinear surfaces that gradually open information to view

Table 1.
Classification of properties of biophilic structures prepared by Heerwagen and Hase [21].

Behind the ornaments, designs, architectural forms, and concrete elements that draw attention with their fractal patterns, there is a universe consciousness pointed out by the philosophy of mysticism.

In the case of more than one mode that oscillates independently from each other, the movement is not chaotic, but if the interaction of the combined connections of these modes, which oscillate in connection with each other, at least in groups of three, they are all affected by the changes in each of them at a specific moment and chaos occurs. Since repetition is possible in linear events, an estimation can be made from previous experience. In nonlinear events, the inability to determine the starting point, small changes in initial conditions turning into significant differences, and the absence of an analytical solution are the causes of chaos. It exists in all scientific fields where uncertainty is valid. Chaos theory deals with the order of chaos. In chaos theory, there is an orderly, beautiful, and solid structure within the irregular, complex, and unorganized structures. Fractal structures explain the order of chaos. Where chaos arises, dimensions become fractal, and fractal structures emerge as systems move from order to chaos. The most common principles of chaos theory; are sensitive dependence on initial state, iteration, chaos patterns, fractal and self-similarity, nonlinearity, strange attractors, turbulence, self-organization, and self-renewal. Chaos and uncertainty apply to all branches of science. The reason is that the number of variables required to make predictions about any event is too large, and it is impossible to create a system that includes all its variables.

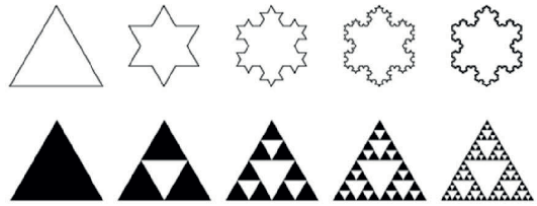


Figure 1.
Sierpinski triangle.

As in the example of the Sierpinski triangle (**Figure 1**), the chaotic structure formed by the iterations of shapes, forms, or systems is an example of chaos.

An inclusive research area examines the part-whole relationship of fractal geometry. It is the analysis area of fractal geometry from honeycomb to leaf veining, computability and unpredictable weather events to the intricate forms of mountains, from the connectivity of the brain to the network structure of the universe's simulated energy fields, from statistics to the urban transportation network. When the fractal pattern of nature is examined, simplicity, esthetics, functionality, and "high design" are witnessed. Each part of the whole carries the self-knowledge of the whole. As in the DNA sequence of a single human cell or a plant seed, the information that exists in essence from the micro to the macro universe repeats itself in each piece. The fractal texture of nature **Figures 2** and **3** develops from the inside out. In this development process, a production method is seen in which the information about the essence repeats itself at smaller ratio, and this production algorithm of vitality has a unique form and esthetic integrity. The most striking fractal pattern is the "Fi number," also known as the "golden ratio," which reveals the perception expressed as "beautiful" and the mathematics of esthetics, giving the value "1.61804." This ratio, which was introduced by the Italian mathematician Leonardo Fibonacci, is also known as the "peak form of the fractal." Although we state that fractal geometry was defined at the end of the twentieth century, it is seen that thinkers, architects, scientists, designers, and painters are not unfamiliar with this production language of nature.

"Pattern repeats of nature's fractal objects".

"The fractal geometry of nature".

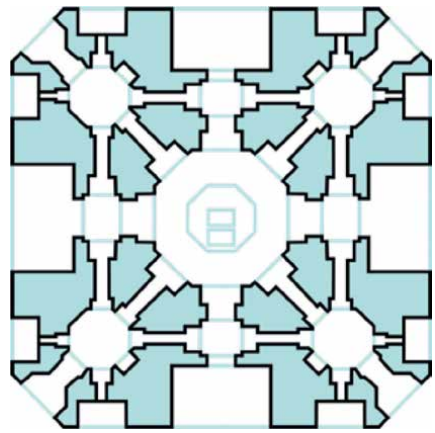


Figure 2.
Taj Mahal Floor Plan.

Figure 3.
The fractal geometry of nature.

4.1 The fractal geometry of nature

The word that Anaxagoras pointed out in 500 BC: There is a part of everything in everything, all things are found in everything to a certain extent and leads us to the part-whole relationship that fractal patterns transplant. Neurology studies using the most comprehensive and systematic data today show us that the layered structure of the brain has a different mathematical system, that the communication network realized in line with this mathematical system creates a connectivity map specific to the individual, and that the connectivity map can change with each new learning. The discoveries in the field of neurology and the "connective holism" methodology brought to the part-whole relationship reveal everything from the brain's communication network to the universe, from science to art, from individual life to cultural structure, is in integrity [22].

While the esthetics and mathematics of the unique fractal patterns produced arouse a deep sense of admiration and amazement in us, the meaning indicated by this symbolism is met in a piece of stone, wood, tile ceramics, literature, music, and plastic arts. Apart from the symbols that invite us to unity from multiplicity in patterns, an architectural arrangement can also be considered as a reflection of fractality. The understanding encountered in the portal designs or courtyard arrangement of many Islamic architectures refers to the concepts of "inner and outer," in other words, "essence and shell," which are related to Islamic Sufi philosophy.

When we focus on the details of nature, we can see that exploring the fractal forms of nature is actually a reflection of the macro level, rather than what is visible on the outside. Because the ontological source of the outside is inside, its meaning is inside. With a detailed look at a simple fern, we witness that it repeats itself at smaller rates and reflects self-similarity in each new branch. Similarly, the fact that a seed contains a tree with its branches, leaves, flowers, and fruits in its seed expresses the depth of the essence, as well as the simplicity of the exterior. The hermetic structure, in which the shell, that is, the form, which is expressed as matter, body, or skin cage, is described as external, contains an essence, a spirit, a meaning that is described as internal. As the path from the shell progresses inward, discoveries, curiosity, and wonder point to the knowledge that development is from the inside out. This "adverb-adjective" relationship presents "a level of principles that support synthesis, integrity, and harmony," not the contrast of inside and outside [23].

In systems that do not show linear behavior, sensitive changes in the initial parameters can create unpredictable results in the system behavior. Incalculable behavior patterns such as the formation of hurricanes, weather events, the path of mist in the air, and traffic flow in the city reveal the uncertainty and unpredictability emphasized by chaos theory. However, the emerging behavior pattern is a situation

that occurs among the possibilities of the whole. Similarly, there is the potential to create unlimited variations when designing patterns. However, the fractal pattern that emerges from the sea of possibilities is again about the whole. This relationship, which is explained in Sufism, points to the existence of an information system that includes the visible behind it.

Sufism tends toward "the search for permanent principles that are inherent rather than temporary and variable." In this sense, Sufism is a way of thinking that offers a methodology and an explanation model at the point of reaching knowledge. Art in Sufism is a journey of truth and truth does not mean the truth of a proposition. In a deeper sense, it is the revealing of the hidden, the transparency of being [24]. In this sense, there is a meaning to be expressed, and a truth pointed out with geometric patterns and motifs consisting of enormous fractal patterns. The fractal patterns of the Alhambra palace, the Taj Mahal, the Divrigi Dârü'ş-Şifa crown gate, the "dıraht-ı cân (tree of life) motif in the Konya Mevlana Tomb. and the star detail of the Sivas Gokmedrese also point to the understanding of unity emphasized by the Islamic mysticism behind the unique artistic and cultural accumulations and symbols of the geography. The meaning implied by fractal patterns draws attention to the metaphor of a mirror in the works of Andalusian Ibn Arabi.

Patterns with enormous symmetry, which can be shown as the pinnacle of fractality, can be found in different geographies; Although they are created with materials such as stone, wood, marble, plaster wall, tile, and ceramic and with different cultural backgrounds, they are completely different forms of inspiration reflected from a single image. Today's research indicate that the fractal pattern of rumi motifs and geometric patterns in the Alhambra palace inspired Escher's drawings in which he describes infinity and cycle; It shows that it was reflected in the decorations of the Istanbul Beylerbeyi Palace as it affected many Islamic architectures and gave it to the architects of the Taj Mahal (**Figure 3**) with its garden arrangement [25]. Similarly, the magnificent architecture of the Taj Mahal points us to the schema of the heavens and the heavens on a page in the third volume of Ibn Arabi's Fütûhât-ı Mekkiye (**Figure 4**) [26].

"Taj Mahal as an example of fractal structure".

Figure 4.
The Taj Mahal points us to the schema of the heavens.

5. Fractality and symbolism in Alhambra palace wall decorations

When viewed from the outside, this palace reflects a reassuring, brave protective spirit, and its garden, like a mother's heart, contains a sensitive, compassionate, peaceful home, a loving mystery. Between the two rivers, Darro and Genil, that carry the healing waters of the charismatic peaks of the Sierra Nevada and Sabika Hill rises. It makes you dream of a silent, wise, and generous soul who lived on its own on this steep plain, whose existence was mixed with legends due to its beauty.

To be recognized as a civilization, it must show a rise and progress in meaning and matter, abstract and concrete, thought and action. Andalusian Islamic civilization is an example where this progress is felt in the idea and in the works that are copies of the idea. Ibn Tufail Abentofail, Ibn Rushd Averroes, and Nureddin Batruci Alpetragius, and many other eminent scientists, philosophers, who grew up under the influence of Cordoba academies, the science center of Andalusia, reached a superior level in both positive and human sciences and trained Christian clergy members and paved the way for scholastic philosophy and therefore the Renaissance. Scholastic is the reinterpretation of the Christian creed with Aristotelianism. It is not a dark period as it is thought; on the contrary, it is a period when the ancient philosophy enriched with the translation-interpretations of Arab scholars was learned from the Arabs and adapted to Christianity, thus laying the foundations of European thought. For example, the Gothic style, which reflects scholastic architecture, realized itself only when the walls were shrunk to the last limit of technical possibilities. This goal of Gothic architecture is seen in the effort of the Arab architects who built the Alhambra, which we will read about in a moment from Kazantzakis. In short, the influence and importance of Andalusia can be understood when the history of this implicit civilization, which was left in the dark due to the excessive light of the Enlightenment and reduced to a legendary/exotic level, is examined [27].

Andalusians, highly developed in mathematics and geometry, have proven their success in their field in the Alhambra Palace they have designed. In the palace, with numerous rooms connected with expansive courtyards, everything is calculated with assured mathematics. Alhambra Palace Architecture in Mural Art with Fractalism and Symbolism In many points of the Alhambra Palace, the construction of which was completed in 250 years, "There is no victor/conqueror except Allah." It has the inscription "La Galiba Illallah" which means (**Figure 5**). The palace, which used to have the rule "No one who does not know the five pillars of Islam can enter," is one of the best examples of "Mudéjar" architecture inspired by the belief in the "afterlife and heaven" [28].

"Alhambra palace architecture in mural art with fractalism and symbolism".

The technology developed for water transportation, the mathematical knowledge used in architecture and garden designs, the geometry encountered in ceiling and wall decorations, and the dazzling unity of the forms that attract attention in room designs and domes are far beyond its era. It is emphasized that the unique style of Andalusian art differs from "the magnificence of the Umayyad dynasty, its luxury-loving attitude and the dignified attitude of the Maghreb rulers." Its architecture makes the spaces feel "the majestic air seen in heavy fabrics and carpets" [29]. According to Owen Jones, the Alhambra is the artistic language of the ancient Egyptians, the natural beauty and refinement of the Greeks, and the geometrical arrangements of the Romans, Byzantines, and Arabs [25].

In addition to the ancient wisdom underlying its esthetic depth, the magnificence of the palace, the richness of the decorations, and the harmony and elegance of the interior attract attention with its simplicity, tranquility, and modesty in the green of the

Figure 5.
The Alhambra palace, which has 'la galibe illallah' written 10,000 times on its walls, is the most visited palace in the world.

hill outside. The owner of this magnificence is pointed out with calligraphy repeated thousands of times on the walls, where the esthetics and elegance of the Alhambra, the most magnificent architecture of its period in every respect, are delicately worked out.

The principles of the Alhambra style are included in the chapter "Moresque Ornament" in the book "The Grammar of Ornament," in which architect, designer, and design theorist Owen Jones explores patterns and design principles from different cultural periods. The unique patterns created by the symmetry, reflection, and repetition of the relations between straight and curved lines are integrated with the architecture. The simplicity of the principles utilized in these complex patterns and the sense of balance arouse great admiration. Professor Antonio Fernandez Puertas phrases that everything is based on a single ratio and that the Alhambra exists from the floor to the wall decorations. The relationship between the side of a rectangle and the diagonal lengths is formed by a simple proportion of the heights calculated by the square roots of numbers such as 2, 3, 4, and 5. It is seen that various variations that give this ratio were used in every part of the palace, in interconnected rooms, in all courtyards, corridors, column lengths, placement, and decorations on it [30]. In the studies of Spanish academicians on Alhambra, it is stated that floor and wall decorations contain original solutions to mathematical problems. It is thought that the development from the inside out in fractal structures coincides with the evolutionary journey of human beings from the shell to the essence in Sufism.

This understanding, which is classified as shell and core, exterior and interior, and matter and meaning, is reflected in detail, such as the portal, the arrangement of the courtyard that opens inward, and the decoration of the pulpit sections in the temples in Islamic architecture. It is seen that the decorations were not made outside the palace and the visitors were invited inside by drawing attention to the portal. The modest design surrounded by trees has a magnificent portal that opens inwards, as seen in many Islamic architectures. Behind the crown door, the courtyards of Jannat-ul Arif (**Figure 6**), which depict the verses of the Qur'an about paradise, and a garden arrangement in harmony with its architecture, meet. Due to the reflection of the flow, cleanliness, and clarity of the water, the Alhambra is also depicted as a palace in the water. In the pools surrounded by small plant groups, the sounds of water flowing from the fountains and the plays of

Figure 6.
Depicted as water as a life-giving element, the Generalife is on an adjacent hill just east of the Alhambra.

light create a rhythm in harmony with the visual integrity; Dark green leafy plants that give coolness and peace, trees that give a sense of smell and freshness increase the depth of the courtyards. The inspiration of the opposite of water is also reflected in the garden and pool arrangement of the Taj Mahal 300 years later [31].

Figure 6, an exemplary garden of fractalism and symbolism in the Alhambra palace and "Jannat-ul Arif Generalife".

The extensive garden named Jannat-ul Arif, located behind the palace and used as a place of rest in summer is considered one of the most successful landscape examples of Islamic architecture today. The construction of the garden, known as the Generalife, began in the thirteenth century and the work in the garden continued until the twentieth century. The construction of the garden known as the Generalife began in the thirteenth century, and the work continued until the twentieth century. Colorful flowers, plants, and trees were sent from various parts of the world for this unique garden. For this reason, Jannat-ul Arif is decorated with flowers and trees. The most attentive plant in the garden is the eight-century-old cypress tree. With its fountains, pools, pavilions and walking paths, colorful plants, and flowers, Jannat-ul Arif hosts the annual music and dance festival in Granada.

The muqarnas in the portal of the Alhambra palace, in the windows, in the arches, and in the ceiling decorations of the rooms, reflect the light from different angles with their intricate forms, creating a perception of perspective. In the structure, which is gradually shrinking from the outside in a layered way, each layer intertwines with the next, forming fractal patterns that seem to progress forever, and the light and shadow plays formed by the niches with different colors of muqarnas evoke a feeling of depth that makes the viewer think of the infinity and enormous order of the universe. Jones states that primary colors, such as blue, red, and yellow, gilding in the Alhambra were seen in the early art phase of civilization, and primary colors were used in the upper parts of the architecture [25].

This harmony, which gives the feeling of infinity, and the relationship established between the interior and the exterior includes the viewer, and it also assumes a place between the interior and the audience [29]. The layered structure of muqarnas and

honeycomb wooden structures in different colors was designed with inspiration from the sevenfold heavens phrase of the Surah Mulk [32]. The high ceiling decorations consist of cedar wood pieces painted with colors representing the seven layers of the sky and pointing to the universe's conception in Islamic mystic philosophy.

The Alhambra palace has geometric motifs and patterns with symmetrical groups, from the floor coverings to the domes. Unlimited variations of patterns can be produced with steps such as translation, reflection, rotation, and shift reflection of a single symmetry group. Intricate network structures formed by simple forms such as triangles, squares, and circles cover the surfaces and create an esthetic harmony that depicts infinity. There are two different classifications for the fractal network structure of patterns. The rooms of the palace, where visitors fall into the Lion's Garden, are decorated with the fantastic nature of Arab architects—the stalactite arch, the nature of which is difficult to understand, and its accurate proportions are difficult to judge. In the daytime, besides the change in lighting, the appearance of the ceiling also changes, creating the illusion of movement. The most complex structure is based on accurate mathematical calculations and philosophical representations of Arab scientists. On the south side of the lion's courtyard is the Hall of Abenserrach (Sala de Los abencerrajes), named after a tragic event—the slaughter of 37 members of the Abenserrach family. This structure has an unusual dome in the shape of an octagonal star decorated with stalactites. Soft light passes through the windows in the dome (**Figures 7–9**).

In drawing star patterns, vertical and curved lines are produced using net guides called construction lines, and then laying on the surface called tessellation is performed. While this algorithmic process, which was carried out with tools such as rope and pencil in the past, was designed with a compass and ruler before computer technologies, it can be produced through programs such as Geometer's Sketchpad together with computer technologies. While a square mesh grid is used in four-layer star patterns, a pattern is created by surrounding other patterns because five-layer patterns do not fit on the square surface. Six-ply patterns are obtained with hexagonal mesh guides [33].

Figure 7.
On the south side of the lion's courtyard is the Hall of Abenserrach (Sala de Los abencerrajes).

Figure 8.
Soft light passes through the windows in the dome" Hall of the Two Sisters (Sala de las Dos Hermanas).

Figure 9.
Octagonal roof and intricate carved windows, of the room of the Abencerrajes family.

Each corner of the eight-pointed star patterns formed as a result of the rotation of the square, also known as the Seljuk star, at an angle of 45⁰, forms an angle of 90⁰. While the algorithmic steps of the eight-pointed star from the mesh grid to the star design are given in image A, variations of the star patterns can be produced from the hexagon mesh grid in image B. Infinity flow is seen in all patterns that transform from simple geometric shapes, such as triangles and squares, to unique fractal patterns. This sense of eternity and esthetic harmony, which arouses admiration in the audience, reflects the depiction of unity in the universe. These patterns indicate an

excellent divine order dominating the material world. The transition from one star to another is continuous, and all the arms that make up the star jump from one star to the next and travel to infinity. There is no space in the surface coating of the patterns or randomness in the movements of the lines; on the contrary, the unity of many lines evokes the harmony of the universe. The fact that no part existing in the layered realm is idle reflects the moderation and unity mentioned in verse. There is a constant movement in the universe from multiplicity to unity and from unity to multiplicity. Although the variations created by fractal patterns are unlimited, they are derived from the same geometric forms [23]. As in Plato's example of the broken mirror, we can look at the sun through shattered mirrors and see hundreds of suns, but when we want to see the actual sun, we raise our heads and witness that there is a sun.

In addition to geometric patterns, vegetal motifs are also seen in the decorations of the Alhambra. The motif emerging from the main body is veined like a leaf and covers the surface, and the area it borderline is filled with various patterns, crests, or lines. It is known that stucco or pseudo-marbles made of material thought to be obtained by mixing marble dust, lime, gypsum, and egg white are used on these surfaces. The reliefs synthesize Greek, Visigoth, and local Iberian art styles. While encountering plain-looking vegetal and geometric patterns drawn in more general lines in the early period drawings, they were enriched with fine lines over time. Plaster decorations are created by using molds in larger spaces and surfaces. It is seen that while marble was used for the magnificent reliefs in the Umayyad period, plaster was preferred in the later periods. Plaster decorations made with the cladding technique on stone or brick walls allowed the production of new motifs and patterns due to the material's ease of use. It is seen that motifs such as palmettes, volute motifs with snail folds, and pine-cones are included in the reliefs [29]. In Alhambra architecture, the building design offers magnificent integrity with columns, garden arrangements, courtyard designs, ornaments in which geometric and floral patterns are integrated, and star systems. It is seen that every particle of this splendor points to infinity, in other words, to the whole. The richness created by fractal patterns opens a door from concrete to abstract with the inscriptions at its heart.

5.1 Geometric patterns in Islamic architecture

Different types of Islamic ornaments are based on geometric rules, the esthetics of this art is geometric in general. Islamic geometric design (**Figure 10**) is a system of abstraction from Islamic beliefs [34]. Islamic art has created a unique geometry while benefiting from the geometric forms of previous traditions. These forms gave identity to Islamic art, not with the reflection of the forms found in the real world, but perhaps with the forms determined by certain lines and borders. Traces of this can be found on geometric surfaces designed by early Islamic artists. The traces of

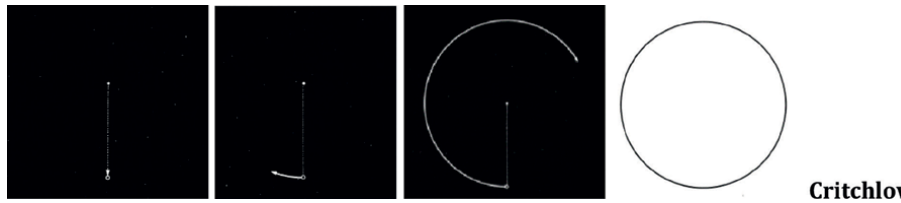


Figure 10.
Geometric basis of Islamic geometric patterns.

the artistic and architectural heritage of ancient cultures, especially central asian and middle eastern societies, are evident in the art and architectural works of the Islamic period. The circle and line are the basis of the proportional system, also utilized in Islamic calligraphy.

Artists used these patterns not only to create visual beauty but also to convey the divine concepts of Islam. Often following religious and philosophical teachings, these artists used visual symbolism to place these divine concepts in patterns. The pentacle was used to symbolize the five teachings of Islam, furthermore, most Islamic geometric patterns artists used the symbolism of numbers and geometric figures, a continuation of the Pythagorean teachings, in creating their art. However, the symbolism is often set in the context of the piece [35].

6. Conclusion

The fractal pattern of nature, which repeats itself and carries the self-knowledge of the whole in every part, offers us a high design example with its simplicity, esthetics, and functionality. From the past to the present, it is seen that fractal geometry, which reflects the production language of nature, has been used in different disciplines, such as architecture, design, art, medicine, and statistics. The essential artistic productions of fractal geometric patterns were realized in thirteen-century Andalusia, and the peak form of fractality was reflected from the floors to the architecture of the Alhambra Palace. Alhambra is where magnificence meets simplicity, landscape with architecture, art, and mathematical knowledge. However, the calligraphy repeated thousands of times on the palace walls emphasized its persistence for centuries. Surfaces where gypsum is mixed with different materials on which geometric patterns are processed, tile ceramics, marble structures, and wood carvings. There is a thought system that is indicated behind each fractal pattern in every corner with its walls, portals, windows, and muqarnas domes, which are equipped with soft and esthetic calligraphy. In this sense, the philosophy of Sufism is seen as a methodology to reach the unity behind fractal patterns. The fractality, mathematical ratio, and esthetic integrity of each work are actually different parts that reflect the influencer, and at the same time, they are interpretations of the whole. It is seen that each pattern transforms from a grid of construction lines into unique fractal patterns that contain various symmetry groups such as straight lines, curves, intersections, integration, reflection, translation, and rotation. It is seen that symbols and symbols are preferred instead of direct expression in Sufism. Symbols indicate the order of the universe, grace in creation, perfection, eternity, and unity. The visual integrity created by the fractal patterns and the feeling of flow to infinity describes the journey and discovery of the viewer himself by drawing the viewer into himself. Hundreds of manifestations of a single ratio are reflected with honeycomb-shaped muqarnas ceilings, wall decoration, calligraphy, courtyard arrangements, landscape, and architecture. Each fractal pattern will provide a mental and spiritual opening in humans; it invites an effort to make sense of relations such as inner and outer, shell and essence, and matter and meaning. The fact that hundreds of fractal forms can be produced from a single mesh grid has the same meaning as the emergence of only one piece out of endless possibilities.

It is thought that this is the expression of being in a new existence every moment as a reflection of the continuity from multitude to unity, from unity to multiplicity. The visible, emerging pattern has the same essence as all patterns that have the

potential to be visible. In the essence of concrete elements, unique forms produced with marble, plaster, wood, or tiles, that is, thousands of beings, there is an abstract system of thought, a sea of meaning, and the reflection of the characteristics of the being that integrates each piece, inviting to interiority and admiring the layered structure of the universe while confronting it with the layered structure of the self. The visible, emerging pattern has the same essence as all patterns that have the potential to become visible.

Author details

Nurfer Tercan
Al-Farabi Kazakh National University, Almaty, Republic of Kazakhstan

*Address all correspondence to: nurfer.tercan@gmail.com

References

[1] Salingaros N, Masden K. Neuroscience, the natural environment, and building design. In: Kellert SR, Heerwagen J, Mador M, editors. Biophilic Design: The Theory, Science and Practice of Bringing Buildings to Life. New York: John Wiley; 2008. pp. 59-83

[2] Ramzy N. Biophilic qualities of historical architecture: In quest of the timeless terminologies of 'life' in architectural expression. Sustainable Cities and Society. 2015;**15**:42-56 (in press)

[3] Hasol D. Dictionary of Architecture and Building. Istanbul: YEM Publications; 1998

[4] Alexander C, Ishikawa S, Silverstein M. A Pattern Language. New York: Oxford University Press; 1977 https://www.vecteezy.com/free-photos Image 4: cited: Image ID: #3575869 License Type: Editorial Use Only Licensed On: 2022-12-05 LICENSE NUMBER: 6F71745A-DDBF-4CC2-98EF-3D932B02F585

[5] Essawy S, Kamel B, Samir M. Sacred buildings and brain performance: The effect of sultan Hasan mosque on brain waves of its users. Creative Space. 2014;**1**:125-143

[6] Karim I. Back to a Future for Mankind. South Carolina: Create Space Independent Publishing Platform; 2010

[7] Hagerhall CM, Purcell T, Taylor R. Fractal dimension of landscape sil-houette outlines as a predictor of landscape preference. Journal of Environmental Psychology. 2004;**24**:247-255

[8] Joye Y. Architectural lessons from environmental psychology: The case of biophilic architecture. Review of General Psychology. 2007;**11**(4):305-328

[9] Abdelaal MS, Abdelaal D. Towards an innovative community: Rethinking the urban configuration of the university campus within new cities. In: Attia S, Shafik Z, Ibrahim A, editors. New Cities and Community Extensions in Egypt and the Middle East: Visions and Challenges. Cham: Springer International Publishing; 2018. pp. 237-256

[10] Fromm E. The Heart of Man. New York: Harper & Row Paperback Edition Publisher; 1964

[11] Krcmárová J. E. O. Wilson's concept of biophilia and the environmental movement in the USA. Klaudyán: Internet Journal of Historical Geography and Environmental History. 2009;**6**(1-2):4-17

[12] Zapsu B. "Silent and Invisible Youth" Not in Education, Employment or Education https://genchayat.org

[13] Ozgen E. Health structures and the healing role of space in human-space interaction. Journal of Art and Design. 2017:184-195

[14] Louv R. The Last Child in Nature (Trans. C. Temürcü). Ankara: Tubitak Publications; 2012

[15] Mumcu S, Regular T, Tarakci E. Traces of ecology in environmental psychology: Ecological approaches in investigating the human-environment relationship. In: Arıdemir H, Kurnaz N, editors. IV. International Afro-Eurasian Studies IV Congress, 27-29 April Proceedings. Kütahya: Academia Publishing House; 2018. pp. 200-213

[16] Rohde CLE, Kendle AD. Human Well Being, Naturall and Scapes and Wild Life in Urban Areas (22). Peterborough:

English Nature Science Report; 1994. pp. 61-69

[17] Ulrich RS. Biophilia, biophobia and natural landscapes. In: Wilson EO, Kellert SR, editors. The Biophilia Hypotesis. Washington: Island Press; 1993. pp. 87-106

[18] Heerwagen J, Gregory B. Biophilia and sensory aesthetics. In: Heerwagen J, Major M, Kellert SR, editors. Biophilic Design: The Theory, Science and Practice of Bringing Buildings to Life. New York: John Wiley; 2008. pp. 227-241

[19] Heerwagen J, Orians GH. Humans, habitats, and aesthetics. In: The Biophilia Hypothesis. Washington: Island Press; 1993. pp. 138-172

[20] Heerwagen J. Biophilia, health and well-being. Restorative Commons: Creating Health and Well-Being through Urban Landscapes. 2009;**39**:39-57

[21] Heerwagen and Hase, Grazuleviciute-Vileniske I, Daugelaite A, Viliunas G. Classification of Biophilic Buildings as Sustainable Environments. Buildings. 2022;**12**(10):1542. DOI: 10.3390/buildings12101542

[22] Kilic T. New Science: Connectivity, New Culture: Living. 2nd ed. Istanbul: Ayrıntı Publications; 2021

[23] Kılıç ME. Introduction to Sufism. An Interdisciplinary Perspective. 8th ed. Istanbul: Sufi Book, Timaş; 2017

[24] Ozkose K. The wisdom dimensions of Islamic art. Cumhuriyet Journal of Theology. 2020;**24**(3):955-971

[25] Saner NT, Ar B. From Owen Jones. Publications on the Decoration of Beylerbeyi Palace; 2019

[26] Kilic ME. Sufi and Art. 1st ed. Istanbul: Sufi Book, Timaş Publishing Group; 2015

[27] Erwin P. Gothic Architecture and Scholastic Philosophy. Istanbul: trans. Engin Akyurek, Kabalci Publications; 2014. p. 42 b. 31

[28] IRVING Washington. Al-Hamra, the Living Legend of Andalusia. Istanbul: trans. Veysel Uysal, Iz Spring; 2016. p. 191

[29] Şeyban L. Andalusia. 1st ed. Istanbul: Albaraka Turk Publications (Görsel 12) (Beksaç, 1995(Al-Sayegh, 1998); 2014

[30] Copestake T. When the moors ruled in Europe(Visual)18 editions published between 2005 and 2010 in English and held by 516 WorldCat member libraries worldwide episode 2. Prelude to the Renaissance. Over Seven Centuries of Islamic Rule, Spain Became the Cultural Jewel of Europe. 2005.

[31] Nassif W. Investigation of Andalusian and Ottoman Gardens in Terms of Landscape Design. Master Thesis. Istanbul: Istanbul Aydın University, Institute of Science and Technology; 2018

[32] Beksac E. Alhambra Palace: One of the Most Important Buildings of Islamic Architecture in Spain. 1995

[33] Broug E. Islamic Geometric Design. Thames & Hudson; 2013

[34] Al-Sayegh A. Developing an Islamic Geometric Design Course for the Department of art Education at the College Ofbasic Education in Kuwait. Doctor Thesis,. Maryland: University of Maryland; 1998 8, 25, 28, 30

[35] Critchlow K. İslamic Patterns. London: Thames and Hudson; 1976 10-13, 24-25, 34, 70, 78, 79

Chapter 11

Diminishing Architectural Artifacts along the Coastal Stretch of Tanzania

Ombeni Swai

Abstract

The purpose of this research was to investigate and document the existing architectural heritage in Bagamoyo and Dar es Salaam in the midst of urbanization, where artifacts have been dwindling over time. The study was carried out using an exploratory methodology and case study strategy, with various tools, such as a field survey, secondary data, physical documentation, and photographing. Several findings were concluded: both Bagamoyo and Dar es Salaam have valuable architectural and cultural heritage elements, such as Arabic, Swahili, Indian, Islamic, Western, and modern and contemporary that must be restored, up kept, and maintained for the two cities' sustainability. Some of the artifacts, such as doors, have inscribed messages that are no longer visible. Demolition and partial replacement of heritage artifacts have been taking place in Dar es Salaam since the 1990s. To save the historical heritage in the two localities, a more comprehensive approach involving the government and other stakeholders (private and public) is required.

Keywords: heritage, urbanization, architecture, conservation, artifacts

1. Introduction

Tanzania is endowed with an abundance of significant cultural heritage resources dating from the Pliocene period (about four million years ago) to the present. These resources are divided into groups and distributed throughout the country. There are archaeological sites like Olduvai Gorge, historical sites like Kaole Ruins and Kilwa Kivinje, historical towns like Bagamoyo and Mikindani, traditional settlements like Kalenga in Iringa, historical buildings like Colonial BOMA, sites with special memories like Colonial Cemetery of World War I and II, and natural features and structures like Amboni Caves and Mbozi Meteorite (the list is shown in the Appendix of the chapter).

The aforementioned historical sites and buildings contribute significantly to the rich culture of both tangible and intangible heritage, showcasing civilization's socio-economic, sociopolitical, socio-spatial, and socio-environmental layers. Historical buildings within the historical culture are endowed with rich architectural artifacts from periods before traders and colonial occupations that have had rich historical attachment and have greatly contributed to the formation of Tanzania's current urban fabric. Old buildings bear witness to a city's or town's esthetic and cultural history, providing people with a sense of place and a connection to the past [1].

Regardless of the rich and long layers of historical heritage present along Tanzania's coast strip, the same belt has been undergoing rampant urbanization, threatening both historical artifacts and intangible heritage (cultural heritage). The old town of Bagamoyo and the City of Dar es Salaam, which share a number of historical monuments and cultural heritage, are the most impacted by ongoing spatial transformations combined with human socioeconomic activities. Regardless of the ongoing disappearance of both tangible and intangible heritages, there is a scanty knowledge of the damage but also lack of documentation of the existing conditions for future generations. Above all, the need for policy to raise awareness, protect, and upkeep the heritage is of utmost importance. Thus, this chapter intends to document and discuss the historical background of the two places, document the existing situation, and propose a policy intervention to protect the heritage.

2. Literature review

Various literatures around the world, particularly in developing countries such as Tanzania, show that conservation of old heritage has not been given as much attention as it is in the developed countries [2]. The challenges facing heritage in the sub-Saharan Africa include the followings: ranked low in government priority scales and it is considered priceless [3], threatened with various forms of economic development [4], contradicting laws and policies governing development within heritage sites [5], not given sufficient resources when compared to other endeavors, such as defense and health; also, they are under stuffed [6], rapid urbanization [7]. Further, it has been urged that poor countries can be affected by a vicious circle, in which the low level of development hinders culture promotion, while the failed exploitation of national heritage, in turn, hinders the possibility of culture-based development strategies [8].

Literature also shows that, despite the lack of attention, cultural heritage is a profitable asset and an important industry, generating millions of jobs and billions of euros in revenue for the countries where efforts to develop and maintain it have been made [9]. Cultural heritage has been associated with the economy in the developed countries, with contributions in cultural economics introducing the concept of cultural capital as a means of understanding the economic dimension of cultural activities in relation to other forms of capital inputs [10].

Furthermore, many of the issues and challenges that developing countries face in terms of heritage management are quite different from those that developed countries face [11]. Some of these differences are what cause places like Bagamoyo and many other Tanzanian towns to fail to preserve their cultural heritage, causing it to dwindle. For example, Bagamoyo, despite facing the challenges of rapid urbanization, lacks the capacity to protect and develop its existing heritage due to a lack of resources. Cultural heritage has been defined as the legacy of tangible items (such as buildings, monuments, landscapes, books, textiles, paintings, or archaeological artifacts) and their intangible attributes (such as folklore, traditions, language, or performance arts) inherited from the past and preserved for future generations because of their artistic, cultural, or historic value [12]. Although the definition here touches on a variety of topics, this study focuses primarily on tangible items, particularly buildings and their immediate surroundings.

It goes on to say that the act of preserving cultural heritage is known as Heritage Conservation, and it primarily focuses on doing everything possible to postpone the natural laws of deterioration on tangible items in order to ensure the transmission of

significant heritage messages and values to future generations. Another author has demonstrated that cultural heritage is now one of the most important global industries, with significant economic benefits for host countries, regions, and local communities. According to the World Travel and Tourism Council's most recent research, cultural tourism represented 40% of all European tourism in 2019, generating 319 million jobs and more than 30 billion € in revenue each year [13]. This means that towns like Bagamoyo can change their economic status if they work hard to preserve their existing heritage.

2.1 Methodology

2.1.1 Case study method and criteria for the study site selection

The study applied a case study method where it was specifically conducted in Bagamoyo, particularly in the conservation area where old buildings with various architectural artifacts are found. The selection of the area of study was in coherences with the subject matter that tries to unveil the insights of diminishing architectural elements in the urbanizing historical towns. Bagamoyo has a long and rich historical background, artifacts, styles, culture, and architectural evidence was selected to represent the case.

As an exploratory research aiming at exploring the level of diminishing of architectural styles in the new development within the historical buildings, the study underscores the architectural styles and design considerations while maintaining its character in historical towns or cities. Primary data collection method involving collecting the information direct from the field through interviews, photographing, sketching, observation, and mapping were applied as data collection tools. The study involved four groups of respondents who included the local authorities (antiquities and district council), professionals (architect, urban planners, and conservation expertise), indigenous, and new residents.

Observation (architectural aspects on building, including circulation, space arrangement, form, shape, textures, building materials, building elements (roof, wall, floor, openings, and building height)) was applied. Also, a variety of architectural styles were determined and seven styles were discussed. These include Swahili style, Indian style, Arabs style, Islamic style, classical style, and modern and contemporary style were outlined for further discourse. Data from the site were analyzed and constituted the main discourse in the study.

3. Findings and discussions

3.1 Overview of cultural heritage in Tanzania

As stated in the introductory part, Tanzania has a number of cultural heritage artifacts that have put the country on the map of the world due to the richness of its heritage. These heritages are distributed all over the country, and they have been sources of tourism attractions wherever they are located. Each heritage contributes a unique artifact of its own kind, thus, in totality, making a rich combination when considered altogether. Some of the heritage sites contain archaeological heritage, including the Oldvai Gorge in the northern part and Kunduchi Ruins in the eastern

part of Tanzania. They showcase the evolutionary history and development of mankind spanning thousands of years of human civilization (**Table 1**—S/N 1).

Likewise, there are cultural heritage sites based on trade along the coast of East Africa where most of these towns remain in ruins, such as Kaole and Kilwa Kivinje (**Table 1**—S/N 2), which date back to the thirteenth century. These towns demonstrate the old civilization in terms of building materials, building styles and typologies, culture, space use, etc. Other sites include historical towns of Bagamoyo and Mikindani (**Table 1**—S/N 3), with their famous slave trade dynamics where slaves were shipped from East Africa to other parts of the world.

Tanzania is also a home for old and traditional rulers who strongly resisted colonization including the Chief Mkwawa from Iringa whose scull was taken to German for years and later returned to Tanzania, currently, hosted at Kalenga Museum in Iringa (**Table 1**—S/N 4). There are also many old German forts (BOMA) located in Dar es Salaam, Arusha, Mikindani, Bagamoyo, etc. (**Table 1**—S/N 5). These are important historical sites showcasing the technology, planning strategies, construction materials, and technology as well as the administrative structures of the colonial occupations.

Other sites include the memorial sites of WWI and WWII, which house the remains of different nationalities that fought in the wars (**Table 1**—S/N 6). The sites demonstrate various layers of civilization and their corresponding struggles for power, existence, success, and development within Tanzania.

Lastly, there are heritage sites due to natural features that still astonish the world today, including the Amboni Caves in Tanga and meteorites located in Mbozi and Mbeya in the southern highlands (**Table 1**—S/N 7). These two sites host scientifically fascinating natural features that attract tourists, archeologists, geographers, and researchers from around the world due to their uniqueness. Mbozi is an ungrouped iron meteorite found in Tanzania. It is one of the world's largest meteorites, variously estimated as the fourth- to eighth-largest. Similarly, the Amboni caves are among the fascinating natural features that are made from limestone complexes, with the longest cave measuring up to about 750 m long. It is believed that the caves were formed about 150 million years ago during the Jurassic period. The area covers about 234 km^2.

3.2 Evolution of Bagamoyo

Bagamoyo is a small historic town in the coastal region of Tanzania, approximately 75 km north of Dar es Salaam. It is one of the East and Central African towns with historical ties to the slave trade, which drew African societies into international economies and promoted exports and infrastructure [14]. The name Bagamoyo is derived from the word "Bwaga Moyo," which means "lay your heart down," where slaves rested after long journeys from the countryside to the coast to be sold to foreign traders. Bagamoyo became the capital of the German occupation in East Africa in the late eighteenth century, serving as the German headquarters for German East Africa (first under the auspices of the German East African Company and then the German Imperial Government) between 1886 and 1891 [15].

Bagamoyo is distinguished by the presence of various cultures and ethnic groups (intangible heritage) in a region endowed with iconic architectural structures ranging from native Swahili, Persian, Arab, Indian, and European (tangible heritage), as well as a blend of several styles. Some of the heritage buildings have been ruined by time; others are in danger of collapsing, and others are only foundation marks. The current

S/N	Type of heritage	Images	Significance	State
1	Archeological sites (**Oldvai Gorge**)		Oldvai Gorge is nicknames as the "cradle of Mankind", believed to be the site of found remains of the first human beings on Earth. It is a paleoanthropological site in the eastern Serengeti Plain, near northern Tanzania, in East Africa	Frequently visited, and the site is maintained
2	Ruins of old civilization **Kaole and Songo Mnara**		Remains of the Kaole ruins, a national historic site located in Bagamoyo, Tanzania The area contains old Swahili coral stone ruins dating to a period between the 13th century and the 16th century.	Remains as ruins with little efforts to upkeep the place
3	Historical Towns (**Kilwa Kinje and Mikindani**)	 Kilwa Kinje	Kilwa Kivinje was originally a fishing village community situated among the ruins of an Oman's established city in early 19th C which was a centre for slave trade run by Arabs by then. Later, it was transformes to the garrison town to support the German colonial rule in Tanznaia. Kilwa Kivinje contains a white obelisk commemorating the Swahili resistance that began in 1888 to German conquest of the coast. The Abushiri War (1888–1891), called the Arab War by Germans, was an	Initiatives are taken to upkeep the place, however, the majority part of these towns are not properly conserved. Some important buildings are disappearing with time

S/N	Type of heritage	Images	Significance	State
		 Kilwa Kinje fort	attempt to push them out of the Swahili Coast. Hassan O. Makunganya, mentioned on the monument, led the resistance to German occupation in the area of Kilwa.	
		 Ruins of Kilwa Kivinje	Mikindani is a historic coastal town located in Mtwara. The name comes from the Swahili word mikinda which means "young coconut trees". Therefore, the term "Mikindani', literally means "the place where there are young coconut trees" in old Swahili language. Mikindani settlement in Mtwara, Tanzania marking some of the oldest towns along the coast of Africa.	Few historical buildings remain functional and well kept, however, a good number of buildings remain in shamble.
		 Mikindani historical town streets		

S/N	Type of heritage	Images	Significance	State
4	Traditional settlements (**Kalenga Iringa**)	 Museum at Kalenga  The skull of Chief Mkwawa	Museum at Kalenga Iringa, housing some historical artifacts and heritage including the head of the famous chief "MKWAWA" who fiercefuly resisted the Germans for a long time. Finally, he was captured, hanged and his head was taken to German for 40 years, later it was returned to Tanzania, housed in this museum.	It is well kept, and active for historical occasions
5	Historical buildings	 Mikindani German BOMA	The Old Boma, a German fort dating from 1895. The place was once an administrative centre in German East Africa as well as being a centre for the slave trade through Reunión, Seychelles and Comoros. It was also famously the stopping point for Dr David Livingstone before his final journey into central Africa. The Arusha German BOMA was built from 1899 to 1900 to be a German military	Converted into a hotel, it remains active throughout. Well-kept and active due to its location. Well-kept and active due to its location. Well-kept however, it is dwarfed by other glazed skyscrapers.

S/N	Type of heritage	Images	Significance	State
		 ARUSHA German Boma-Museum for Natural history  Remains of the Dar es Salaam Arab-German Old BOMA  Old Boma-current status	outpost for the region of Arusha. This was to keep a closer eye on the Meru and Arusha tribes, whose opposition they had just defeated in the years 1897 and 1898. The Dar es Salaam Arab German Old BOMA was built in 1866 to host royal guest during the reign of Sultan Majid bin Said. It also stood as a symbol of authority at the harbor front. It later became the administrative offices of the German and British administrations in Tanzania. Later, it was used as a government office in post-independence.	

S/N	Type of heritage	Images	Significance	State
6	Sites with special memories	 Colonial Cemeteries of the WW1 in Dar es Salaam, Tanzania	Dar es Salaam War Cemetery now contains 1,764 Commonwealth burials of the First World War, 60 of them unidentified, and 41 from the Second World War, 7 of them unidentified. The 112 war graves of other nationalities, the majority of them Belgian and German, all date from the First World War.	Well maintained site
7	Natural features and structures (**Mbozi Meteorite located in Mbeya, Tanzania**) **Amboni caves in Tanga**	 Meteorite in Mbozi, Mbeya, Tanzania	**Mbozi** is an ungrouped iron meteorite found in Tanzania. It is one of the world's largest meteorites, variously estimated as the fourth-largest to the eighth-largest; it is located near the city of Mbeya in Tanzania's southern highlands. The meteorite is 3 metres (9.8 ft) long, 1 metre (3 ft 3 in) high, and weighs an estimated 16 metric tons (16 long tons; 18 short tons.	Well maintained site

S/N	Type of heritage	Images	Significance	State
		 Amboni Caves, in Tanga Tanzania	These are among fascinating natural features that made from limestone complex with the longest cave measuring up to about 750meters. It is believed that the caves were formed about 150million years ago during Jurassic age. The area covers about 234 km.^{2}	There are about ten caves, however, only one is active due to maintenance

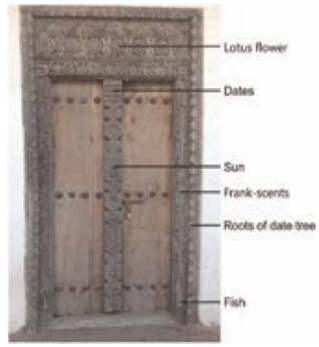
Table 1.
(S/Ns 1–7) Overview of the cultural heritage in Tanzania.

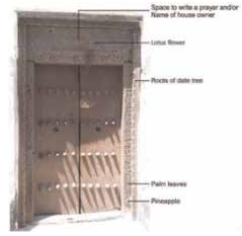
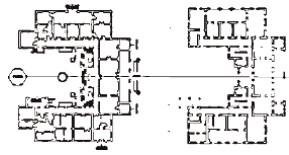
situation in Bagamoyo raises concerns and questions about the historical town's future if action is not taken to reverse the current trend, which is destroying all of our legacy, identity, and value.

3.2.1 Architectural heritage in Bagamoyo

The legacy of Bagamoyo's historical town is threatened by the construction of industries along the Bagamoyo corridor and plans to build a new Bagamoyo port, both of which are triggering large-scale investment in Bagamoyo, attracting people to migrate from various parts of the country to Bagamoyo in search of employment and other opportunities for residential, institutional, and commercial spaces. Because of the rapid pace of urbanization occurring within and around Bagamoyo's historical town, there has been an increase in new buildings that do not respect Bagamoyo's heritage. The architectural features of the old buildings, such as windows, materials, roof, doors, and street characters, are not considered in the new buildings (**Table 2**). This situation undermines Bagamoyo's value and identity on a daily basis, resulting in the disappearance of the historical heritage.

Bagamoyo, like other coastal old towns, has struggled to preserve the legacy, value, and identity of the historical town's architecture in the face of the mushrooming of new buildings with various architectural styles, mostly contemporary and modern

S/N	Style	Building elements	Properties
1	**Arabic style** • Arabic Door	 	• Dates, fish, date tree roots, lotus flower, frank-scents, and the sun are all symbols seen on Arabian doors • *Figure: 01, Arabic door found in Bagamoyo.* • Fish is a symbol of fertility and the birth of humanity. The fish sign, which appears at the bottom of the door, is a prayer for the people of a particular building to have more fertility and security. • The roots of date trees, which enable during the dry seasons in places with deserts or semi-deserts, are the second sign on Arabian doors.
	Arabic Window • Curved window opening • Omani Arabs style	 *Custom house curved windows*  *Mwambao Primary School*	• Arabic Curved opening (w × h) 1500 × 2650 • Material used are stones finishing with white lime. • Window has two sashes and divided into two segments • Wall ornamentation • Window (w × h) 900 × 1500 mm

S/N	Style	Building elements	Properties
	Arabic Roof • Parapet walls		• Parapet walls were utilized not just for safety, but also for decoration and to conceal the roof structure. • *Figure: 05, Triangle parapet wall (old post office)*
2	**Indian style** • Indian door hand carved heavy doors and frames copper knobs.	 *Indian Door found in Old Fort main entrance*	• Prayer space, lotus flowers, palm fronds, pineapples, and date tree roots are five ethnic motifs seen on Indian doors. At the top rail, there is a decorative, symbolic prayer place that also serves to write the house owner's name. • The palm leaves on the design represent the wealth that the Indians have amassed over many generations through coconut plantations on the Swahili coast.
	• Indian windows • Hardwood doors and windows		• Basic window with two sashes divided into three parts on top wire mesh for security. • Window sill and door sill are at the same height.
	Indian Roof		• Square parapet wall (old fort roof)
3	**Western style** • Classical Column		• Greek Doric column as a structure part in old post office (millennium hotel) • 3M Height
	• Floor Plan • Circulation		• The floor plan is symmetrical as well as the interior circulation is linear, rooms mostly has 3 × 3 m and headroom is 3.6 m and plinth level is 750 m
4	**Islamic Style** Islamic Roof		• The Islamic roof décor parapet wall
5	**Swahili** Roof		

S/N	Style	Building elements	Properties
	Floor plan circulation		• Central courtyard • The house's focal point for daily activities and family gatherings is the courtyard.
6	**Modern**		• Clean, minimal lines. • Broad roof overhangs. • Walls of glass and large windows. • Open and well-defined floorplans • Modern and traditional building materials. • A relationship to the outside environment
7	**Contemporary**		• Large windows • Open plan • Use different element styles in the single building

Table 2.
Various historical heritage artifacts in Bagamoyo and their properties.

architecture. If the trend of constructing new buildings with new features within the historical town continues, one wonders if Bagamoyo will continue to be "Bagamoyo".

In a nutshell, the Bagamoyo historical town is undergoing a rapid urban transformation as a result of technological advancement and economic development, with these development activities having massive architectural implications for the historical urban fabric. This necessitates the conduct of a study to provide insights into the architectural patterns established by historical public buildings and how they may be blended with upcoming buildings that will be integrated into the old historical setting.

3.2.2 Diminishing of architectural heritage

3.2.2.1 Building status in Bagamoyo

As previously stated, urbanization has resulted in both socio-spatial and socioeconomic transformations in Bagamoyo. Growth has occurred at the expense of existing old heritage rather than in accordance with its conservation. Much effort and interest have been expended by the government, individuals, and investors to erect new structures while allowing the old ones to decay and deteriorate over time. The vast majority of them have been dismantled, and some are in poor condition. Although a few buildings have received some renovation programs, the maintenance has not been sustainable. Buildings in Bagamoyo have a variety of meaningful historical types of windows (Swahili with Indian and Arabic features) that are being replaced by modern glass windows (**Figure 1**). Similarly, have beautiful facades with bay windows that are also left to stand out.

Figure 1.
Series of German buildings with balconies covered to increase the floor plan area.

3.2.2.2 Building facades

Building facades were created to communicate messages to the outside world. Extensive verandahs/balconies, long eaves, courtyards, and massive walls were all used to demonstrate design and construction solutions for the existing situation. White paint was used on the facades to reflect back the impinging heat and solar radiation. In some cases, white is used to communicate the rulers' authority and power. In comparison with the new upcoming buildings, the facades lack architectural and attractive features, instead being purely functional, as illustrated in **Figure 2**.

3.2.2.3 Doors and windows

Doors in historical heritage buildings are decorated with engraved decorations that represent hidden meanings, such as ownership, origin, type of business, personality, and so on. These types of important information were attached to the frontage of the buildings in order to convey a message to visitors or passersby. The urban fabric was designed to engage people in their interactions with the outside world (**Figure 3**).

3.3 Architectural ornamentations

Bagamoyo's historical heritage is embellished with ornaments in windows, facades, door openings, balconies, balustrades, roof eaves, and parapet walls. These not only add ornamental value and beauty to buildings, but they also tell the story of past

Figure 2.
Historical architectural artifact vs. current architectural artifacts (source: Author 2022).

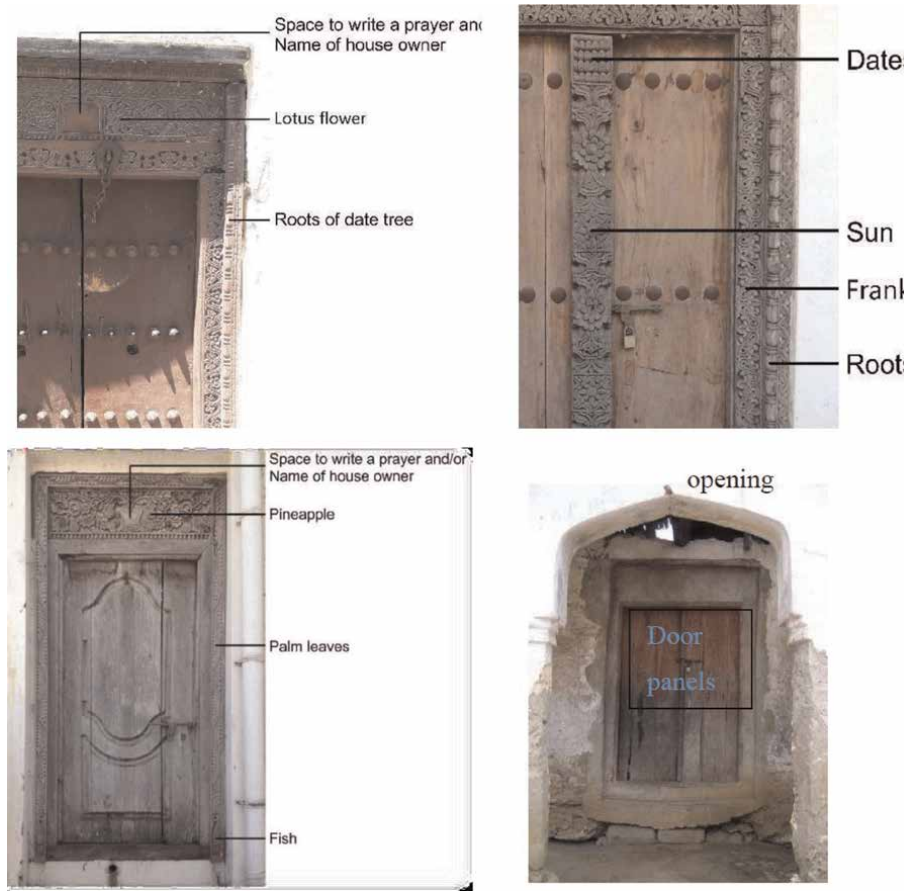


Figure 3.
Different kinds of doors found in old heritage that are disappearing (source, Mosha 2019, edited by the author).

perfection and professionalism. They speak of a culture of beauty and perfection, a culture endowed with artisans concerned not only with the functionality of the buildings but also with their meanings, language (semiotics), and self-satisfaction. Patience can be seen in the ornaments, as well as the time it took to design and realize the small details and the overall structure. Endurance of the material preparations (lime, coral stones, mangrove wood) to the point where the beauty of the buildings as shown in Indian, Arabic, and Swahili styles was realized in the end (**Table 3**). It can be seen that ornamentation was consistent from one style or layer to the next, and each style had its own symbol to represent its era.

The ornamentations that were inscribed in openings were connected to the meanings borne by the users or the owners of the buildings. For instance, door frames were inscribed with prayers, name of the owner, and types of business the owner was dealing with such as dates as shown in **Table 4**. Other ornamentations were meant for decorative purposes such as flowers, sun, fish, pineapple, and palm leaves. All the ornamentations were contextual, that is, were obtained from the surrounding context or social background of the owners.

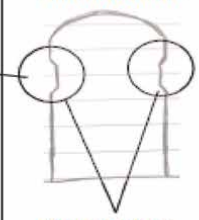
S/N	STYLE	WINDOW	DETAILS
1	Indian		-Window has two sashes and divided into two segments -Wall ornamentation -(wxh) 900x1500mm
2	Arabic		-Arabic Curved opening (wxh) 1500x2650 -Material used are stones finishing with white lime.
3	Swahili and Arabic		-Opening detail (wxh) 1500x2200 Shallow curve  Corner edges

Table 3.
Ornamentation in openings.

As previously stated, Bagamoyo has a rich historical heritage that should be preserved for future generations; however, many of the buildings containing those architectural artifacts have been left to deteriorate or replaced by other modern buildings, resulting in the loss of many valuable heritages.

3.4 Architectural heritage in Dar es Salaam

Dar es Salaam served as a second headquarters for the German occupation of Tanzania, but it had previously been exposed to Arabs, who left a few architectural artifacts in the urban fabric. The German occupation significantly influenced Dar es Salaam's formal planning in terms of streets, blocks, layout, and circulation systems. Furthermore, the occupation has made significant contributions to the city's main old

Symbol	Arabian door	Indian door	Mixed Arab-Indian door
Space to write a prayer and/or name of house owner		✓	✓
Lotus flower	✓	✓	
Dates	✓		
Sun	✓		
Frank-scents	✓		
Roots of date tree	✓	✓	
Palm leaves		✓	✓
Pineapple		✓	✓
Fish	✓		✓

Table 4.
Different doors and their compositions and symbolism.

urban fabric, which can be found in strategic locations such as the old post office, ocean road, the Old Boma, and several buildings along Sokoine drive.

Dar es Salaam, on the other hand, has been subjected to unprecedented urbanization pressure in recent decades [16, 17]. This has resulted in a boom in contemporary construction methods, with little regard for existing old buildings and historical fabric in general. The presence of old heritage within the city's historical areas is critical, as it has been stated that the intertwining of architectural styles provides a sense of place that evokes life before the present and contributes to the character that serves as an intangible asset [1, 18, 19].

It should also be noted that the appearance of building materials has blended into the streetscapes, for example, carved timber doors and windows, decorative ironwork, timber facades, wooden railings, roofing tiles, and so on. The original building heights in the Central Business District (CBD) balanced the skyline, allowing religious structures, such as temples, churches, and mosques, to dominate the silhouette and serve as a point of reference for the city [20]. This would have been the language of the CBD area if the new structures had not eroded the skyline (**Figure 1**).

Azpeitia Santander et al. [21] stated that in Dar es Salaam, architectural heritage conservation is managed by various government and private organs. Several lists have been issued by the government's Department of Antiquities, the Dar es Salaam Master Plan Consortium, the government's Ministry of Lands, Housing, and Human Settlement Development, and DARCH (Dar es Salaam Centre for Architectural Heritage), a private nonprofit organization concerned with architectural heritage conservation. Because the lists are not reconciled as one, they contradict one another, resulting in conflicts over managing architectural heritage buildings and giving power to urbanization due to a lack of a consistent list [1].

3.4.1 Elimination and replacement of architectural heritage buildings

Samora Avenue, Bridge Street, and Kaluta Street were demolished, and at least 12 new buildings were constructed. At least 9 of the 12 built buildings were built on previously undeveloped land, and 3 were built on the sites of demolished structures

(**Figure 4**). The rate of urbanization began to accelerate at an unprecedented rate in the 1980s, thanks to the implementation of a free-market economy policy that attracted foreign investors who came with specific requirements for where they should build their structures. Due to this pressure, and because the country was attempting to attract investments, the government was lenient in limiting some of the conditions stipulated by the investors. As a result, it paved the way for investors to demolish some of the old buildings in order to create space for their offices/investment buildings.

According to the literature, the demolition of old heritage has been increasing since the post-independence period of the 1960s; however, as stated in the previous section, the speed of demolition increased more between the 1990s and 2020, as shown in **Table 5** and **Figure 5**. Similarly, new structures that do not respect heritage have been built in the same location to replace the old heritage. As a result, both tangible and intangible heritage are dwindling in the CBD area. Various initiatives have been put forward by private and public institutions; however, the effect is already significant.

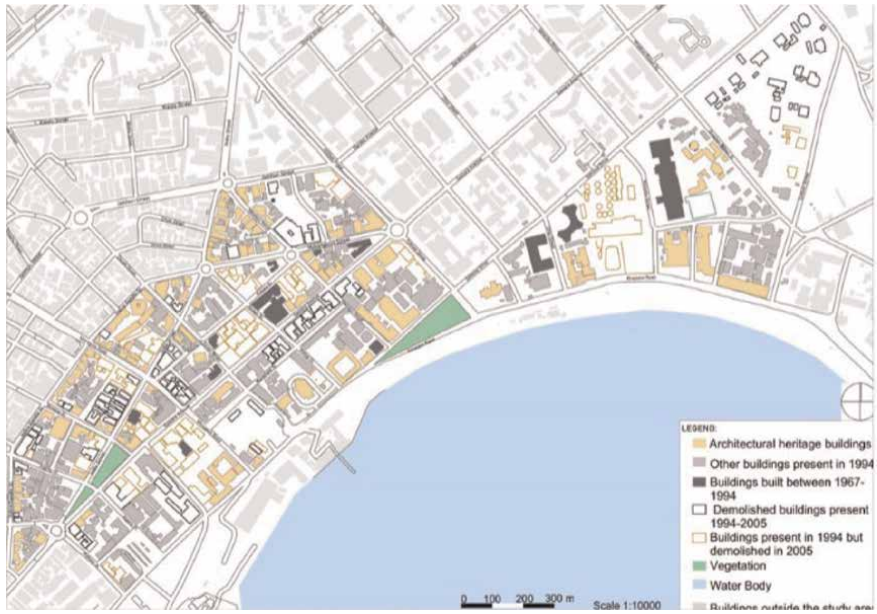


Figure 4.
Map of the CBD showing the old heritage buildings that were demolished due to urbanization forces.

Years	Interval	No. of demolitions	No. of built structures
1967–1994	27	9	12
1994–2005	11	57	22
2005–2020	15	35	41

Table 5.
Building demolished and new buildings from 1967 to 2020.

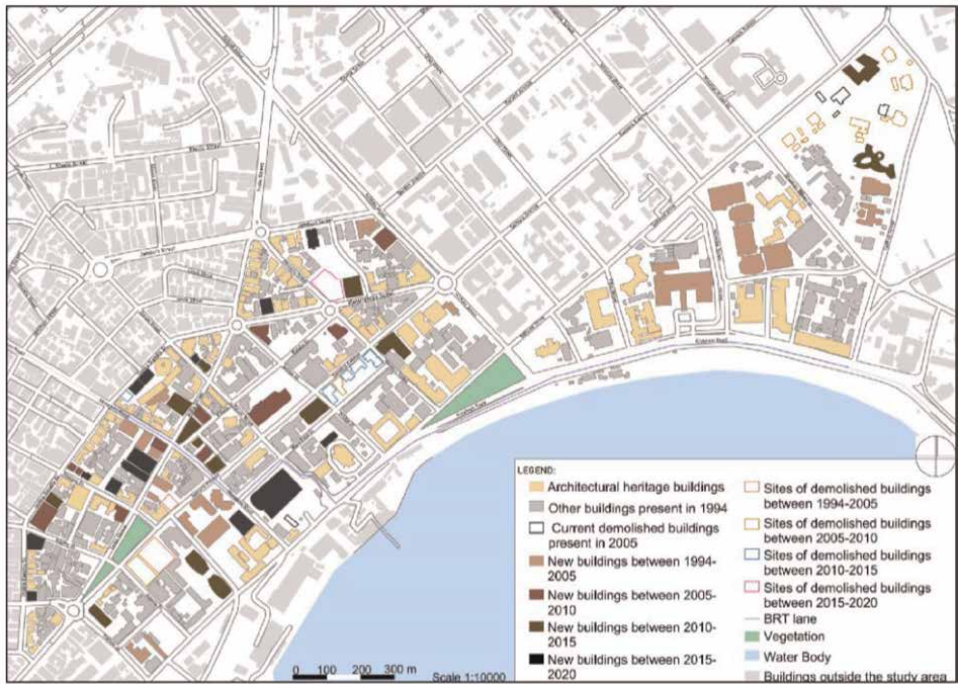


Figure 5.
New buildings erected in the historical heritage CBD from 1990 to 2020.

3.5 Countermeasures

The Historic Urban Landscape review, according to Ref. [21], could be used to strike a balance between architectural heritage conservation and urbanization, with the goal of ensuring larger-scale sustainable development in the city. In this context, new functions such as service-oriented activities like ecotourism can provide social and economic benefits as well as city accommodation. This is demonstrated by the trend between 1995 and 2020, when changes in building fabric were influenced by its ability to generate income, thereby balancing with the economy.

Furthermore, Tanzania, Ghana, and South Africa have been identified as countries with good legal frameworks for heritage conservation, with these laws establishing administrative structures responsible for heritage protection in various forms [22]. Having responsible organs and tools, such as Tanzania's Antiquities Department, can be a starting point for developing effective mechanisms for the protection and upkeep of historic heritage, such as those in Bagamoyo and Dar es Salaam.

4. Conclusion

Generally, Tanzania is rich in cultural heritage sites that cover historical ruins, historical towns, traditional settlements, historical buildings, sites with

special commemorations, and natural features with cultural importance. These sites with cultural heritage are distributed in the central, south, north, coastal, and lake zones, making the country famous for tourist attractions in all aspects. The majority of the overall heritage sites are well maintained as compared to the specific cases of Bagamoyo and Dar es Salaam, where the main discourse was focused.

More specifically, Tanzania's coastline has a rich history comprised of numerous layers of civilizations that have left behind both tangible and intangible cultural legacies. These legacies serve as landmarks and memories of the city for future generations. It is also stated that there are fewer heritage items now due to a number of factors, such as carelessness, ignorance, the economy, and a lack of appropriate conservation policies.

Both Bagamoyo and Dar es Salaam have valuable architectural and cultural heritage, as documented in the analysis, with elements from Arabic, Swahili, Indian, Islamic, Western, and modern and contemporary. The styles were accompanied by distinct building components, such as doors, windows, roofs, building materials, and layouts, that distinguished one style from another. These elements contribute significantly to the history and value of the two historical locales, and they have been dwindling over time.

According to the study, most architectural artifacts from the two localities are left to deteriorate over time due to a lack of resources, proper management, a lack of integrated policies between urban development and urban conservation, and a lack of awareness of the importance of historical heritage.

Accordingly, there is a need to raise awareness among local officials, the government at large, and a few private individuals who own heritage buildings so that they can collaborate to develop strategies to manage the heritage. The data show that unstoppable variables such as population, regulations, and the economy drive urbanization. Heritage policies should be developed through a participatory process in which the government should involve other stakeholders from both the private and public sectors in order to achieve a common understanding of the importance of identifying, protecting, and conserving heritage resources for social, economic, and environmental sustainability.

DOI: http://dx.doi.org/10.5772/intechopen.111715

Appendix. Images of the historical places mentioned in the introduction

Figure A1.
Image of the Oldvai Gorge located in Ngrogoro, Arusha, Tanzania is known as the cradle of humankind.

Figure A2.
Remains of the Kaole ruins, a national historic site located in Bagamoyo, Tanzania.

The area contains old Swahili coral stone ruins dating to a period between the thirteenth century and sixteenth century.

Figure A3.
Kilwa Kivinje.

Figure A4.
Kilwa Kivinje was originally a fishing village community situated among the ruins of Oman's established city in early nineteenth century, which was a center for slave trade run by Arabs by then. After the end of the slave trade, this place became the garrison town to support their colonial efforts in the Southern Tanzania.

Figure A5.
Mikindani settlement in Mtwara, Tanzania marks some of the oldest towns along the coast of Africa.

Figure A6.
Mikindani is a historic coastal town located in Mtwara. The name comes from the Swahili word **mikinda** *which means "*young coconut trees." *Therefore, the term "Mikindani', literally means "the place where there are young coconut trees" in old Swahili language.*

Figure A7.
Museum at Kalenga Iringa houses some historical artifacts and heritage, including the head of the famous chief "MKWAWA," who fiercely resisted the Germans for a long time. Finally, he was captured, hanged and his head was taken to German for 40 years, later it was returned to Tanzania, housed in this museum.

Figure A8.
The remain of the skull of chief Mkwawa in Kalenga Museum in Iringa.

Figure A9.
Mikindani German BOMA.

Figure A10.
ARUSHA German Boma-Museum for natural history.

Figure A11.
Remains of the Dar es Salaam Arab-German Old BOMA.

Figure A12.
Mbozi Meteorite located in Mbeya, Tanzania.

Mbozi is an ungrouped iron meteorite found in Tanzania. It is one of the world's largest meteorites, variously estimated as the fourth-largest to the eighth-largest; it is located near the city of Mbeya in Tanzania's southern highlands. The meteorite is 3 meters (9.8 ft) long, 1 meter (3 ft 3 in) high, and weighs an estimated 16 metric tons (16 long tons; 18 short tons).

Figure A13.
Colonial cemeteries of the WW1 in Dar es Salaam, Tanzania.

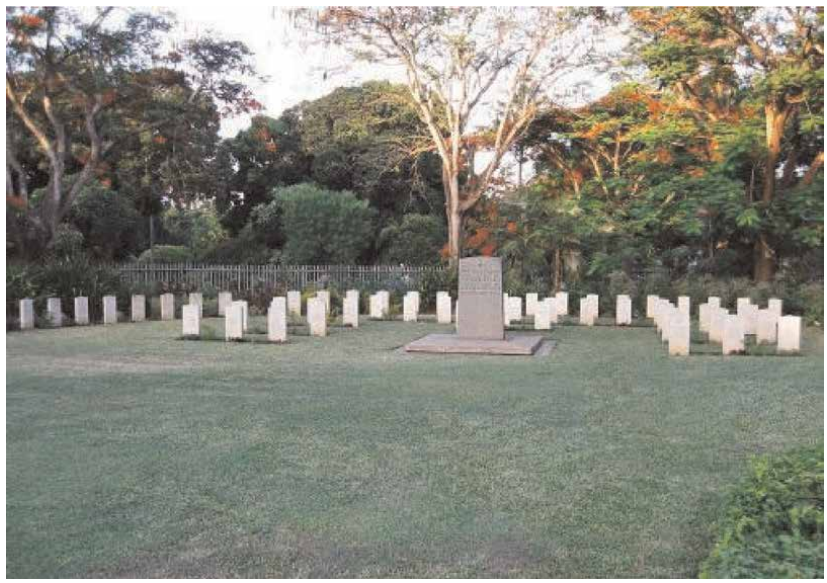


Figure A14.
Commonwealth cemeteries in Dar es Salaam.

As demonstrated in the introduction part, the above list constitutes an important historical heritage in Tanzania and Dar es Salaam and Bagamoyo in particular.

Author details

Ombeni Swai
Department of Architecture, Ardhi University, Dar es Salaam, Tanzania

*Address all correspondence to: swaiarcht@gmail.com

IntechOpen

References

[1] Swai O, Mbosha D, Mpyanga S. Urbanization and vulnerability of architectural heritage: The case of Dar es Salaam CBD. Conservation. 2021;**1**: 216-227. DOI: 10.3390/conservation 1030017

[2] Keitumetse S. African Cultural Heritage Conservation and Management: Theory and Practice2016. DOI: 10.1007/ 978-3-319-32017-5_1

[3] Smith LJ. The Use and Abuse of Heritage. London: Routledge; 2006

[4] Chirikure S, Manyanga M, Ndoro W, Pwiti G. Unfulfilled promises? Heritage management and community participation at some of Africa's cultural heritage sites, International Journal of Heritage Studies. 2010;**16**(1-2):30-44. DOI: 10.1080/1352725090 3441739

[5] Ndoro W, Mumma A, Abungu G, editors. Cultural heritage and the law: Protecting immovable cultural heritage in English speaking sub-Saharan Africa, ICCROM Studies in Conservation 8. ICCROM: Rome; 2008

[6] Transboundary Africa. Situational Analysis: World heritage and Impacts of Development in Africa. Johannesburg: African World Heritage Fund; 2012

[7] Ndlovu N. Legislation as an Instrument in South African heritage Management: Is It effective? Conservation and Management of Archaeological Sites. 2011;**13**(1):31-57. DOI: 10.1179/175355211X13097 877338932

[8] Donatella Saccone D, Bertacchini E. Culture, Heritage and Economic Development—Empowering, Working Paper NewSeries, International Centre for Research on the Economics of Culture, Institutions, and Creativity Developing Countries. 2011

[9] Otero J. Heritage Conservation Future: Where We Stand, Challenges Ahead, and a Paradigm Shift. 2021. Available from: https://onlinelibrary. wiley.com/doi/full/10.1002/gch2.2021 00084

[10] van der Borg J, Russo AP. The impacts of culture on the Economic development of Cities. European Institute for Comparative Urban Research, Draft Report, Erasmus University Rotterdam.; 2005

[11] Timothy DJ, Nyaupane G, editors. Cultural Heritage and Tourism in the Developing World, A Regional Perspective, Routledge. 2009. pp. 280

[12] 1ICOMOS, Carta del Restauro, the First International Congress of Architects and Technicians of Historic Monuments, Athens, 1931. Available from: https://www.icomos.org/en/ 167-the-athens-charter-for-the-restora tion-of-historic-monuments [Accessed: June 2021]

[13] Travel & Tourism. World Economic Impact Report, World Travel & Tourism Council, London. Google Scholar; 2019

[14] Charles L. Characterisation of mortar deterioration in historic buildings in Bagamoyo, Tanzania. International Journal of Engineering and Advanced Technology Studies. 2015; **3**(4):1-12

[15] Herschel J. 1868–1893 Bagamoyo Catholic Mission: What Old Sketches and Documents Tell. Dar es Salaam: Top Desk Production Limited; 2002. p. 1

[16] Kigadye F. Architectural conservation in rapidly urbanizing cities: The case of Dar es salaam, Tanzania. Les Cahiers d'Afrique de l'Est/The East African Review [En ligne]. 2014;**49**: 2014. Available from: http://journals.openedition.org/eastafrica/342

[17] Seifert A, editor. Global City-Local Identity? Dar es Salaam: Mkuki na Nyota; 2017

[18] Seifert A, Moon K. Dar es Salaam, A history of Urban Space and Architecture. Dar es Salaam: Mkuki na Nyota; 2012

[19] Kiruthiga K, Thirumaran K. Effects of urbanization on historical heritage buildings in Kumbakonam, Tamilnadu, India. 2019;**8**(1):94-105

[20] Sykes L, Waide U. Dar es Salaam. A dozen drives around the city. 1st ed. Dar es Salaam: Mkuki na Nyota; 1997

[21] Azpeitia Santander A, Azkarate Garai-Olaun A, De la Fuente AA. Historic urban landscapes: A review on trends and methodologies in the urban context of the 21st century. Sustainability. 2018;**10**(8):2603. DOI: 10.3390/su10082603

[22] Chikure S. Heritage Conservation in Africa: The Good, the Bad, and the Challenges. Cape Town, South Africa: Department of Archaeology, Heritage conservation in Africa, University of Cape Town. pp. 1-3

Edited by Kabila Hmood

This book provides a comprehensive overview of cultural heritage, including urban and architectural heritage in cities worldwide. It highlights the importance of studying "urban conservation" and the effects of increasing population growth in contemporary cities, which causes expansion of modern urban land use, especially towards the historical centers and districts of cities. Preserving architectural and urban heritage is very important in illustrating the concept of "dual cities," in which the old parts preserve their architectural style while the modern part of the city is being developed in the same heritage style. The book is organized into three sections on: "Urban Heritage within Urban Renewal Policies", "Conservation of Urban and Architectural Heritage", and "Loss of Identity, Cultural and Architectural Heritage".

Published in London, UK

IntechOpen

ISBN 978-1-83768-615-5