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## Role of Urban Rehabilitation in Achieving Sustainability in Heritage Urban Area

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### ABSTRACT

Sustainable urban rehabilitation plays a vital role in preserving cultural heritage while addressing the evolving demands of modern cities. This study examines the intersection of heritage conservation and sustainable urban development, emphasizing the balance between environmental, economic, and social factors. The deterioration of heritage sites threatens cultural identity and community cohesion, yet rehabilitation efforts often face challenges such as financial limitations, technical expertise gaps, and conflicts with contemporary urban needs. This research employs a comparative analysis of case studies to identify best practices and mechanisms for integrating sustainability into heritage rehabilitation. The findings underscore the importance of strategic investment, stakeholder collaboration, and adherence to international preservation standards to ensure sustainability of heritage sites. By bridging cultural preservation and urban sustainability, this study highlights the need for comprehensive planning to support more inclusive and adaptive cities.

**Keywords:** Heritage, Sustainability, urban Rehabilitation, Urban Development.

### 1. Introduction

Sustainability is crucial for the rehabilitation of historic urban areas, enabling the preservation of cultural heritage while accommodating contemporary urban demands. Urban rehabilitation aligns

with sustainable development goals by promoting environmental conservation, fostering economic growth, and enhancing social inclusion [1]. However, the rehabilitation has numerous benefits, there are several challenges such as insufficient funding, lack of expertise, and potential conflicts with modern urban needs can hinder its implementation [2]. Addressing these challenges requires strategic planning, stakeholders' collaboration, and adherence to international guidelines to ensure long- term preservation and functionality of heritage sites.

The research aims to explore How can urban rehabilitating can contribute to sustainable urban development in diverse urban contexts, while also examining the challenges and opportunities in integrating sustainability principles in urban Rehabilitating practice. By employing a comparative analysis of various examples, the study systematically identifies mechanisms that have been effective in balancing heritage conservation with urban growth. Ultimately, the research underscores the critical need for sustainable rehabilitation mechanisms that align with contemporary urban development objectives, ensuring that historic areas continue to thrive for future generations.

## **2. Literature review**

### **2.1. Sustainable development**

Sustainable development refers to the development form which can satisfy the needs of current society without compromising the requirement of development for the future generation [3]. In order to further clarify the planning and and the environment's ability to meet present and future needs, specific sustainable development goals and targets were set and explained in the document of the United Nations, committing to achieving better, sustainable development by 2030.

Urban sustainability in relation to historical and heritage sites plays a vital role in preserving social capital, generating economic opportunities, and enhancing the sense of community and belonging. The new urban agenda highlights the importance of these sites as essential elements of sustainable urban development, particularly through sub-goal 11.4, which focuses on enhancing efforts to protect and preserve the world's cultural and natural heritage. [4] [5]

Integration in historical areas represents achieving compatibility between the various functions and the uses between historical and contemporary architecture in light of current and future requirements as well as achieving integration between the traditional and contemporary built

environment within its urban surroundings. It is also an attempt to restore links among different aspects of development. This can be achieved by finding a balance between the material and moral cultural heritage in a way that ensures achieving compatibility between historical areas and the contemporary urban environment. This can occur through achieving various functions while preserving the attractiveness of the place with its historical nature [6].

## **2.2. Urban Rehabilitation**

Building rehabilitation refers to interventions designed to improve the habitability, safety, and energy efficiency of a structure while restoring the functionality of buildings that are degraded or obsolete. These interventions may include repairing or replacing structural elements, renovating facades and roofs, reconfiguring interiors, or introducing new uses for the building. This approach plays a vital role in preserving built heritage and promoting urban renewal [7]. Urban rehabilitation focuses on revitalizing urban spaces, including public infrastructure, while also addressing the renovation of buildings [8]. It encompasses efforts to balance the original identity of a structure with the transformations introduced by the rehabilitation process. Achieving this balance is critical to ensure that the interventions respect the building's historical and architectural significance.

However, the complexity of this process often deters professionals, as it requires a deep understanding of the building undergoing rehabilitation. Many technical professionals hesitate to engage due to the challenges involved in maintaining this balance. Alves emphasizes that urban development through rehabilitation extends beyond buildings. It includes enhancing the city's socio-economic, cultural, and sporting structures, promoting sustainable mobility, and improving public spaces. This approach aims to address current challenges by focusing on urban land use and maximizing the architectural value of both buildings and public spaces. [9]

## **2.3. Urban Rehabilitation International Experiences**

This section shows the criteria for managing Heritage area to achieve sustainable urban development in three examples Le Marais-Paris, Londonderry- Ireland, Fez -Morocco. They will be analyzed according to the dealing with the natural resources, the dealing with the capital resources, and the dealing with heritage area.

### **2.3.1. Le Marais, Paris**

In le Marais Paris, the management of heritage area to achieve sustainable urban development was analyses based on three key pillars: natural resources, capital resources and the effective dealing with heritage areas. First, the dealing with Natural Resources involves the rational utilization of available resources, including the use of local building materials and traditional construction methods in restoration processes. This approach not only supports environmental sustainability but also helps preserve the activities and crafts that characterize the area, delivering both social and cultural benefits. The project's philosophy centers on addressing conflicts among residents, removing encroachments, and socially uplifting the occupants of these properties. Additionally, it emphasizes the rehabilitation of craft activities in a way that aligns with the preservation goals of the historic city. By fostering community engagement and building trust in the preservation policy, the project seeks to ensure the sustainable conservation of the area while highlighting its cultural and historical value.

Secondly, dealing with capital resources in Le Marais involved preserving the unique traditions and customs of the community, which reflect the neighborhood's historical development and are sustained by residents as a legacy for future generations. Efforts were made to raise residents' awareness of the value of heritage, encouraging their active participation in reviving and rehabilitating the area. This awareness stemmed from recognizing the tangible and cultural benefits of preservation, ensuring the neighborhood's intrinsic values and historical messages endure. Additionally, community participation was integral, with collaboration among local authorities, urban planners, civil society organizations, and shop owners, all contributing to maintaining the distinct character of the historically significant buildings.[10]

Thirdly, dealing with heritage areas in Le Marais focused on preserving historic buildings and their surroundings in alignment with their heritage significance to ensure the sustainability of the area as a whole. Regular maintenance of rehabilitated heritage buildings was facilitated through a collaborative approach between occupants and responsible authorities, requiring prior consultation for any changes. Financial support was provided, with owners receiving 20% of restoration costs as a grant and 60% as a loan, while non-compliance could result in property confiscation. The 1962 legislation for heritage protection strictly prohibited unauthorized alterations or new

constructions, requiring approval from relevant authorities. Additionally, the spatial identity and unique character of the area were preserved by repurposing several hotels into museums, reinforcing the area's cultural and historical significance.

### **2.3.2. Londonderry, Ireland**

In Londonderry- Ireland, the management of heritage area to achieve sustainable urban development was analysed based on three key pillars: natural resources, capital resources and the effective dealing with heritage areas. First, the dealing with Natural Resources concerns the Rational use of available resources, employing local building materials and traditional construction methods in restoration processes, and the preserving activities unique to the area that provide social and cultural benefits.

Secondly, dealing with capital resources in heritage areas emphasizes preserving community traditions and customs, strengthening social bonds among residents, and creating connections between various heritage sites, enabling comprehensive visitor tours. Efforts to encourage historical atmospheres and social interaction include hosting celebrations and recreational activities organized by residents, enhancing both community engagement and visitor experiences. Raising awareness of heritage value has inspired residents to care for historic buildings, as seen in Londonderry, where adaptive reuse for tourism has deepened public appreciation of history. Active community participation has been fostered through employment opportunities provided by authorities, with Derry achieving the highest employment rate in Northern Ireland. Social initiatives have also encouraged public activities in vibrant squares, promoting interaction between visitors and heritage areas. Additionally, government efforts to improve underutilized spaces and create links between heritage sites have established a unique cultural environment, attracting visitors to enjoy its rich art, history, and natural beauty.

Third, dealing with heritage areas involves preserving historic buildings and their surrounding zones, focusing on protecting them from deterioration and ensuring timely rehabilitation. Infrastructure improvements accommodate growing tourism while enhancing public squares and surrounding environments to create an integrated heritage atmosphere that benefits residents,

visitors, and the city at large. Heritage buildings are repurposed to provide lasting community benefits, such as being converted into hotels, tourist attractions, or commercial zones, boosting investment in the area. Regular maintenance of rehabilitated buildings ensures their sustainability, while opportunities for reuse generate additional income for responsible authorities, reinvested into preservation efforts. Maintaining the use of historically valuable buildings reduces costs related to alternative structures, improves functionality, and minimizes relocation expenses, supporting both the preservation and practical use of these assets.

The rehabilitation programs for heritage areas in Londonderry, Ireland, were supported by a collaborative effort involving multiple entities, funding sources, and innovative community-focused initiatives. The Urban Design Strategy for Londonderry was developed with the participation of the North West Development Office under the DSD (Department for Social Development). Funding for the 1997 Derry city project was primarily provided by the Northern Ireland Environmental Agency (NIEA), ensuring alignment with international conservation principles, including the ICOMOS Charter for the conservation of culturally significant sites and the Burra Charter of 1999. A major milestone was the extension of the walled city of Derry, with a conservation plan initiated in 2006 to preserve its urban, social, and economic heritage. The project emphasized inter-sectoral collaboration, engaging stakeholders such as the NIEA, the City Council, the Tourist Board, the Honourable the Irish Society, Planning and Road Services, and the Department for Social Development. Additionally, financial aid and novel initiatives supported community engagement in the development process, fostering a sense of ownership and responsibility among residents for the sustainable development of cultural heritage [11]. By integrating community involvement and leveraging the city's urban wealth, this approach ensured that cultural preservation and economic sustainability went hand in hand.

### **2.3.3. Fez, Morocco**

In Fez- Morocco, the management of heritage area to achieve sustainable urban development was analyses based on three key pillars: natural resources, capital resources and the effective dealing with heritage areas. First, dealing with natural resources in Fez focuses on the sustainable utilization of available materials, including the manufacturing and preservation of leather for traditional production, as well as the use of clay for pottery. These practices extend to the restoration and rehabilitation of buildings, where local materials and traditional building methods

are employed to maintain the region's cultural heritage. The utilization of these resources is evident in the buildings and crafts that continue to thrive, reflecting the region's deep connection to its natural environment. Fez, renowned as the scientific capital of the Kingdom of Morocco, is also famous for its centuries-old leather tanning craft, a tradition passed down through generations. For many residents, this craft is not only a livelihood but a crucial effort to preserve an ancient practice, ensuring that this valuable part of Morocco's heritage endures. Leather tanning, one of the oldest traditional crafts in the kingdom, continues to be a significant aspect of the cultural identity and economic life of Fez.



**Figure 1.** The traditional crafts and stages of leather industry in Morocco.

Secondly, dealing with human resources in Morocco involves preserving the rich traditions and customs that distinguish the country, such as unique practices in food, clothing, weddings, religious celebrations, festivals, and dialects that vary by region. The Moroccan tradition of hospitality is particularly notable, especially towards tourists visiting the country's heritage cities. Efforts to increase public awareness of the value of heritage sites have seen significant involvement from residents, who demonstrate their commitment through active participation in the preservation and maintenance of these areas, ensuring their sustainability for future generations. Community participation in Fez, and Morocco more broadly, reflects a shared dedication to preserving buildings, crafts, and the surrounding environment, with a focus on finding collective solutions to emerging challenges. The optimal use of available human resources is encouraged through craft training, which helps develop skilled workers excelling in the region's traditional crafts [12] . In

addition to the restoration of hotels, organizing markets, and tanning houses, efforts have been made to build schools dedicated to preserving arts and traditional crafts. To reduce the impact of industrial activities on historic buildings, workshops and factories have been relocated outside the city walls, helping to protect the integrity of heritage sites while sustaining local craftsmanship and industries that attract tourism.

Thirdly, dealing with heritage areas involves preserving historic buildings and their surrounding environments through various strategies. This includes reusing the historic areas and buildings to meet modern demands (Figure 3), such as transforming them into recreational, cultural, and tourist attractions. Three model projects have been established in the housing sector, while a new eastern area is being created to accommodate ongoing rural migration and alleviate population congestion in the old city. Projects focused on preserving the natural environment, such as restoring mosques and schools, aim to return their functional life after they have become heritage sites, highlighting the area's uniqueness and boosting tourism and financial returns. In addition, modern buildings are constructed to replace collapsing structures, with careful attention to their facades to ensure they blend harmoniously with the city's character [13]. Planning efforts also include the creation of pedestrian pathways and the preservation of open green spaces, as well as regulating traffic flow to ensure that the city's markets are only accessed through a limited number of closed-end streets. Regular maintenance of restored heritage buildings is ensured through the training of specialized personnel capable of maintaining and restoring these historic structures. Additionally, projects to restore key elements of the city and reorganize the area.



**Figure 2.** Before and after restoration and rehabilitation of some buildings [14].

Entities involved in funding and investing in the rehabilitation programs for heritage areas in Fez include a combination of local, national, and international stakeholders working together to



preserve the city's cultural heritage. The rehabilitation operations are spearheaded by the Old Fez City Council, in cooperation with the International Committee for the Preservation of Cultural Heritage at UNESCO, and the Ader-Fez Agency (Agency for the Removal of Slums and Renewal in Fez). Funding for the project is provided by various sources, including UNESCO, the Donor Countries Group, the Moroccan Government, and the World Bank, which funds the Fez City Rehabilitation Project under the Ader-Fez Program. The project benefits from inter-sectoral participation for resource conservation, involving entities such as the Moroccan Ministry of Culture, in collaboration with other relevant ministries [14][15]. The Housing and Planning Unit of the Graduate School, in partnership with the rehabilitation organization for Fez city, contributes to the development operations, especially in the construction of projects on vacant land. Additionally, UNESCO deployed experts under the Moroccan government to prepare urban studies for the city's preservation process, during which the necessity to expand the project was identified, further strengthening the collaborative efforts to safeguard the heritage and sustainability of Fez [13]. Table (1) shows the mechanisms of Dealing with Heritage Areas to achieve Sustainability based on the previous studied experiences of le Marais Paris, Londonderry Ireland and Fez Morocco.

**Table 1.** Mechanisms of Dealing with Heritage Areas to achieve Sustainability (Authors).

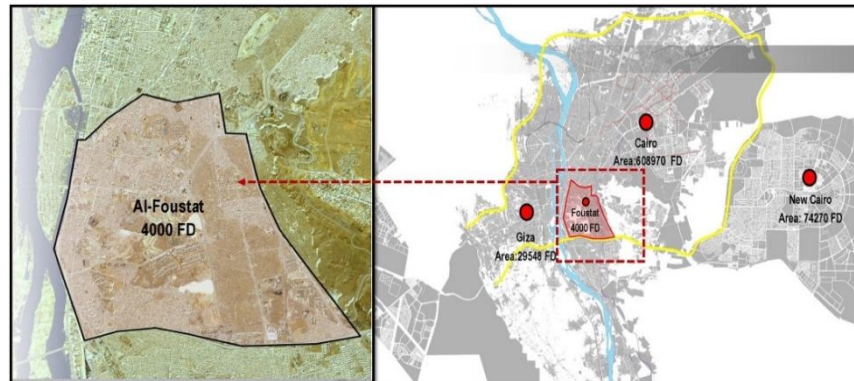
	Le Marais, Paris	Londonderry, Ireland	Fez, Morocco
Function Sustainability mechanism	Maintaining commercial establishments, industries, and widespread traditional crafts.	Sustainability of the Foyle River for economic growth through recreation and tourism.	Focusing on crafts and industries that attract tourists.
Historical Identity preservation mechanism	<ul style="list-style-type: none"> <li>• Preserving historic palaces and architectural features.</li> <li>• Preserving the historical authenticity and character of the area.</li> </ul>	<ul style="list-style-type: none"> <li>• Sustainability of historical identity through preservation of city character.</li> <li>• Ensuring the authenticity and identity of heritage areas through integrated development.</li> </ul>	<ul style="list-style-type: none"> <li>• Preserving the historical authenticity of the area.</li> <li>• Restoring and maintaining key heritage buildings and their surroundings to sustain historical identity.</li> </ul>

Public Participation mechanism	Engaging local residents and shop owners in the conservation efforts.	<ul style="list-style-type: none"> <li>• Active involvement of residents in preservation efforts.</li> <li>• Collaboration between international, national, and local entities to support conservation.</li> </ul>	<ul style="list-style-type: none"> <li>• Public participation reflects commitment to preservation.</li> <li>• The collaboration between local authorities, international organizations, and citizens.</li> </ul>
Holistic Development Mechanism	<ul style="list-style-type: none"> <li>• Addressing the neighborhood as an integrated whole to promote holistic development.</li> <li>• Ensuring the continuity of the area's architectural, social, and economic values.</li> </ul>	<ul style="list-style-type: none"> <li>• Encouraging the integration of historical atmosphere, social interaction, and events.</li> <li>• Enhancing waterfront views and heritage properties for tourism.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensuring continued benefits of heritage buildings, such as tourism, and creating new development opportunities.</li> <li>• Developing tourism, investment, and collaboration with municipalities to ensure long-term success.</li> </ul>
Citizens Awareness Mechanism	Enhancing awareness has led to increased community involvement in preservation efforts.	Community involvement has contributed to greater awareness and support for sustainability.	Fostering awareness of the value of heritage sites, increasing public care.
Private Sector engagement Mechanism	Supporting private sector contributions to sustainability initiatives.	Private sector and institutions developed a strategy for rehabilitation.	Involving private sector initiatives to help fund and sustain heritage areas.
Existing Roads And urban Gaps Between Heritage Areas	Preserving the existing road network, expanding some roads, and opening new pathways as needed.	<ul style="list-style-type: none"> <li>• Developing pedestrian pathways, preserving green spaces, and controlling traffic flow.</li> <li>• Development of areas between heritage sites to enhance connectivity.</li> </ul>	<ul style="list-style-type: none"> <li>• Preserving roads, improving infrastructure to accommodate tourism.</li> <li>• Focusing on restoring mosques, schools, and other key buildings to preserve their functional life and heritage value.</li> </ul>
Adaptive reuse mechanism to benefits local community	<ul style="list-style-type: none"> <li>• Creating spaces that attract investment and tourism.</li> <li>• Reuse of heritage buildings for modern functions like tourism.</li> </ul>	<ul style="list-style-type: none"> <li>• Creating new uses for heritage buildings that provide benefits to the community.</li> <li>• Rehabilitating buildings for new functions to sustain the area economically.</li> </ul>	<ul style="list-style-type: none"> <li>• Creating commercial spaces, hotels, and attractions for tourism while ensuring their sustainability.</li> <li>• Reusing heritage buildings and providing avenues for</li> </ul>

			income and maintenance.
Property value Enhancement	Increase in property values due to improvements and investments.	Property value growth due to improvements; investments for future maintenance.	Increase in tourism and property value due to heritage preservation and improvements.

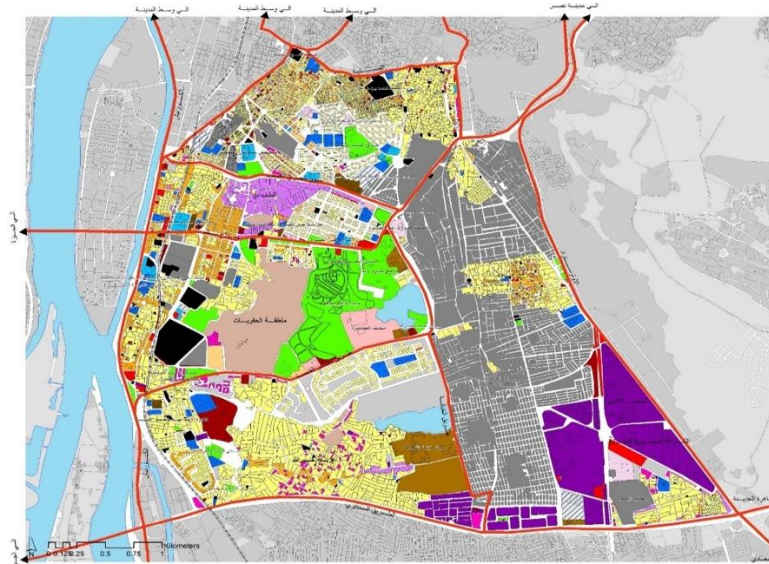
#### 2.4. Case study of Al-Fustat

The study area is located in the heart of Cairo (Figure 4), within the districts of Al-Khalifa, Misr Al-Qadima, and Sayyida Zeinab. It is bordered to the south by the Ring Road, to the north by Al-Salibiya Street, to the east by the Autostrad Road, and to the west by the Corniche Street.



**Figure 3.** Location of the study area: Al-Fustat in Old Cairo.

Al-Fustat has diverse land uses, including museums such as the National Museum of Egyptian Civilization and the Coptic Museum, as well as exhibitions and workshops, most notably the pottery craft workshops in the Batn Al-Baqara area. Additionally, the area includes Al-Fustat Park, which serves as a recreational space for the city of Cairo. The urban mass of the study area covers 3,917 acres, of which 886.6 acres (approximately 23%) are residential areas, 540.8 acres (about 14%) are allocated for services, and 427.7 acres (around 11%) are designated for various activities. Roads and urban open spaces occupy 1,058 acres, accounting for approximately 27%, while the remaining area consists of natural lakes and other land uses.



**Figure 4.** Land Use of Al Fustat, 2011.

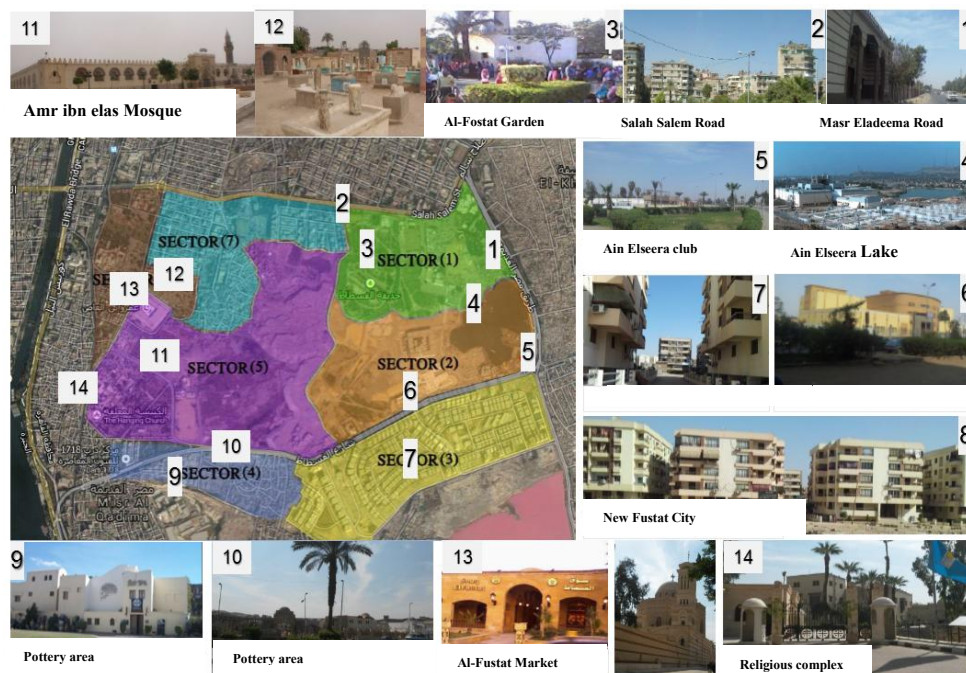
#### **2.4.1. Comprehensive Rehabilitation plan for Al-Fustat**

The Ministry of Culture has launched a large-scale project to develop Al- Fustat area in Old Cairo, focusing on the archaeological site, a ground-level reduction plan to preserve historical artifacts, and the redevelopment of residential areas overlooking the new National Museum of Egyptian Civilization. This initiative aims to rehabilitate Fustat through an integrated approach that encompasses conservation strategies, intervention plans, and a comprehensive heritage site management framework. It also includes detailed measures for preservation, protection, and maintenance, while addressing damages caused by human interventions. Additionally, the project seeks to enhance public awareness of the site's historical and cultural significance and implement both short- and long-term strategies to ensure sustainable development. Fustat has long suffered from neglected buildings and deteriorated areas that distort its historical landscape. To restore its heritage value, the project follows a structured rehabilitation approach that involves conserving and maintaining historical buildings, redesigning modern structures to complement the area's historical character, and removing severely deteriorated sections. The ultimate goal is to transform Fustat into a vibrant historical and cultural hub that attracts tourism, stimulates economic growth, and ensures long-term sustainability.

The rehabilitation strategy is grounded in internationally recognized conservation standards, focusing on restoring archaeological sites and historical buildings, enhancing the surrounding

natural and built environment, and developing sustainable management plans that support the site's integration into daily urban life. To achieve this, the project sets forth both short- and long-term objectives. In the short term, efforts will be directed toward developing a strategic master plan for Fustat, covering approximately 4,000 acres, upgrading informal settlements to improve residents' quality of life, and introducing new tourism, recreational, service, and artisanal activities that align with the site's historical significance. In the long term, the project aims to enhance the overall quality of life for informal settlement residents across Cairo by redeveloping urban areas and improving infrastructure networks, including modern transportation systems, to enhance connectivity within the city center.

To ensure effective execution and long-term sustainability, the project involves dividing the area into distinct zones based on the presence of historical structures, ruins, or remnants (Figure 5). Each zone will be carefully integrated into the broader heritage framework, with detailed documentation of conservation and restoration efforts, assessment of access and connectivity, and sustainability measures utilizing available resources and expert recommendations. Through this approach, the project seeks to maximize Fustat's heritage value, transforming it into a sustainable cultural and economic asset that benefits both local residents and visitors.



**Figure 5. Sectors of development in Al-Fustat, Authors.**

### 2.4.2. Urban Rehabilitation Approaches to achieve Sustainability in Al-Fustat

The rehabilitation of Fustat as a heritage area is a multifaceted process that involves careful management of natural resources, capital resources, urban heritage, and financial investments. The mechanism for dealing with Fustat as a heritage area relies on the integration of these four elements to ensure a sustainable, culturally rich, and economically viable transformation of the region. Cairo is undergoing a significant urban transformation, replacing informal settlements with sustainable and culturally rich developments aimed at improving living conditions, increasing green spaces, and boosting tourism while preserving its historical heritage. Notable projects include the redevelopment of the *Batn Al-Baqara* slum into the *Fustat View* neighborhood, offering scenic views of the *Fustat Hills Gardens*, and the *Bani Hilal* estate, and Egypt's first *Hilton Old City* hotel, enhancing its appeal as an entertainment hub. Meanwhile, the *Ain Al-Hayat* area, historically plagued by unplanned construction and high-water levels, has been cleared of unsafe housing and cemeteries, with residents relocated to safer units. The Egyptian government envisions the entire area as a global tourist attraction, leveraging historical landmarks like the *Amr Ibn Al-Aas Mosque*, ancient churches, the Jewish Temple, and the *Museum of Civilization*, while redeveloping *Lake Ain Al-Hayat* for public use. Urban Rehabilitation Cairo's strategy to modernize infrastructure while preserving its cultural identity.

#### a. Sustainable Use of Natural Resources

The sustainable utilization of available resources in Fustat's heritage restoration involves using local building materials such as clay, ceramics, and wood, ensuring both authenticity and long-term environmental sustainability. A key component of the development plan is the establishment of a training center focused on preserving traditional crafts and utilizing natural resources to maintain the region's artisanal heritage [16]. The craft centers, initiated by the Ministry of Culture, aim to revive and showcase the area's rich legacy while fostering a creative and vibrant present. These centers provide a platform for artists to practice their trades, reinforcing the cultural and artistic value of traditional craftsmanship, and positioning Fustat as a cultural beacon in one of Cairo's most historically significant areas.





**Figure 6. The workshops in the Botn al-Baqara project in the Old Cairo district.**



**Figure 7. Al Fustat Ceramics Center showing the using of local materials [17].**

In addition, Ain Al Sira Lake has been cleaned up and turned into a tourist area with a walkway and restaurants.



**Figure 8. Ain Al-sira Lake in 2000 before development and in 2022 after development.**



**Figure 9. Ain Al-sira Lake after development.**

## **b. Capital Resources Management**

The Capital resource management aspect of Fustat's rehabilitation focuses on preserving the community's traditions and promoting awareness of the area's cultural heritage. The residents of Fustat maintain strong ties to their traditional crafts, passed down through generations, and these artisanal skills represent a unique cultural identity that reflects the essence of the past. The local

community plays a pivotal role in the preservation process, not only participating in restoration efforts but also taking responsibility for the upkeep of the site post-renovation, ensuring its sustainability. The development of the area follows a historically sensitive approach, going beyond mere physical restoration to preserve the area's deep historical essence while actively involving the community. To further optimize and develop human resources, the government and relevant authorities have implemented structured training programs to preserve these crafts for future generations. These initiatives include the establishment of specialized centers for pottery, ceramics, and glassmaking, along with a technical education school that integrates modern technology with traditional craftsmanship, ensuring the continuity of these invaluable skills.

### **c. Preservation of Urban Heritage**

Managing heritage areas in Fustat involves comprehensive efforts to preserve both heritage buildings, culture [18] and their surrounding environments [19]. This includes the development of pathways leading to homes, road paving, and various improvements initiated by the General Authority for Tourism and Antiquities, which focus on restoring heritage buildings. These projects also reinforce buildings around the heritage sites and implement municipal services to enhance the area's squares, roads, pathways, and lighting. Infrastructure projects are being coordinated and executed by relevant authorities, including the Ministry of Transport, the Electricity Company, and the National Water Company. Routine maintenance of rehabilitated heritage buildings, however, is not always feasible due to some shortcomings by governmental agencies and other responsible bodies.

Nevertheless, there is ongoing internal maintenance overseen by the administration in charge of each site. For example, the transformation of the area into a tourist and heritage destination: the church complex is carefully maintained by the authorities involved in its rehabilitation, Rehabilitation of Amr Ibn Al-Aas Mosque and its surrounding areas, Development of Fustat Park and its transformation into the largest green park in Cairo, Development of Ain Al-Sira Lake and its transformation into a tourist area with a walkway and restaurants (Figure 11), Establishment of the Fustat Hills Project, an integrated green area with tourist and cultural activities (Figure 13). Moreover, less than 10% of the slums' residents in the site such as Abu Qarn, and Batn Elbaqra have been resettled in new housing. Random workshops and factories were moved to organized



industrial areas and the cemetery area is now being demolished and the remains of the dead are being transferred to other cemeteries in Badr City. The project prioritizes improving the economic circumstances of those remaining by ensuring existing infrastructure and the area's potential for developing local crafts.[5]



**Figure 10. Abu Qarn: the area was developed within Fustat Grand Park project.**



**Figure 11. Development in Batn Elbaqra area.**



**Figure 12. Project Jawharat Al-Fustat in Batn Elbaqra area.**



**Figure 13. Al-Fustat Historical Garden Plan.**

#### **d. Stakeholders Participation**

The rehabilitation of Al-Fustat area involves a collaborative effort from multiple entities, including the General Authority for Urban Planning, the Antiquities Authority, the Ministry of Culture, the Cairo Governorate, the Urban Coordination Authority, and investment companies like Arab Contractors and others overseeing the restoration work [21]. Funding for the project comes from various sources, with Greek institutions supporting the Religious Complex and the Greek Orthodox St. George Church, while the Egyptian Ministry of Antiquities provides funding for other buildings in the complex and surrounding areas. Scientific oversight is managed by the Remote Sensing Authority, ensuring technical and restoration standards are met. The success of the project relies on intersectoral collaboration between government agencies, consulting firms, and executing companies like Arab Contractors, all working together to preserve resources and ensure the comprehensive restoration of the Religious Complex and its environment

### **3. Conclusion**

sustainable heritage rehabilitation requires a comprehensive approach that integrates cultural, social, economic, and environmental considerations. By learning from successful case studies and applying evidence-based strategies, we can ensure that our cities remain vibrant, sustainable, and culturally rich for future generations. In conclusion, Rehabilitation of heritage areas is the optimal tool for achieving sustainability in heritage areas, due to the following reasons. The architectural and urban aspects of the heritage buildings and areas were given significant attention, as shown in Al-fustat in the rehabilitation of the Religious Complex, the Mosque of Amr ibn al-As, and the surrounding area. The overall improvement of the area has elevated its social, economic, and cultural status. Furthermore, sustaining the heritage area has been ensured through projects that provide funding for routine maintenance and operational costs. However, projects have been carried out, there is a lack of a mechanism from the responsible entities to utilize the revenue generated from these projects for the maintenance of the area. The restoration of the heritage area to its former commercial and service-oriented state, bringing it back to its original era. Additionally, the available resources in the area, consisting of "natural resources and human resources," have been leveraged to revive the area, utilizing untapped potential that will lead to a transformative change, attracting investments to the region.

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