

Sustainable urban design and the future of heritage cities

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Abstract

Heritage cities suffer today from many challenges and urban transformations represented by economic and social stagnation, loss of urban identity, demographic changes, technological developments, and environmental and health challenges. It is necessary to deal with heritage cities in accordance with the principles of sustainable urban design and in a manner that suits the conditions of cities by choosing the appropriate and correct strategy from sustainable urban design strategies for the purpose of making them sustainable and vibrant in the future and branding place globally while preserving the imprint of the place in it. Thus, the research problem was identified (difficulties related to the appropriate and correct selection of sustainable urban design strategies in the future of heritage cities). The study dealt with the case study with the analysis of the Hafsia quarter in Tunisia, with the possibility of benefiting from it in other heritage cities, including the Iraqi cities, due to the challenges and urban transformations they are exposed to, and to conserve their cultural identity and place an imprint on them. The research found the possibility of mixing sustainable urban design strategies according to the economic, social, environmental, cultural and physical conditions of each area, with the effectiveness of the sustainable urban regeneration strategy for being a comprehensive and complete approach and providing effective solutions appropriate to the conditions of heritage cities.

Keywords: heritage city, sustainable urban design, strategies of sustainable urban design, sustainable regeneration, cultural heritage
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Introduction

From an architectural and urban point of view, the heritage cities are distinguished by their historical capabilities, which constitute a large part of the city's identity and cultural heritage. It is necessary to conserve the existing and protect the heritage, and create sustainable development in its economic, social, environmental and cultural aspects for future of the heritage city, which will contribute to saving heritage cities from urban and social deterioration and economic stagnation, the research highlights sustainable optimistic urban design strategies for their application in Heritage cities. The research aims to determine the most appropriate strategic approach from the strategies of sustainable urban design for the future of heritage cities.

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Research problem

The research problem is the difficulties related to right and suitable choice of sustainable urban design strategies for future of heritage cities.

Hypothesis

The exact choice of sustainable urban design strategies concern environmental, social, economic and cultural characteristics can preserve and enhance the future of heritage cities, and preserve their identity and place imprint in its future.

Research motivation

1. Providing appropriate knowledge about sustainable urban design and its strategies.
2. To provide knowledge about the heritage cities and their nature, the urban challenges they are currently experiencing. And the importance of cultural heritage in sustaining these cities and making them vibrant in the future.
3. Analysis an case study of an Arab heritage city with a distinctive traditional and heritage character and holder of the Aga Khan Award to extract the most appropriate strategy for the area's conditions from the strategies of sustainable urban design, and the possibility of applying them in other heritage cities, including Iraqi cities, due to the urban pressures and challenges.

Definition of sustainable urban design

Sustainable design represents an important part of the philosophy of sustainability and includes the design of physical objects, the built environment and services that comply with the principles of social, economic and environmental sustainability for the purpose of achieving human well-being and nature [7]. Urban sustainability is defined as "The integration of social, economic, cultural and environmental considerations to create a more suitable place to live in the present and the future". Sustainable urban design is a change in the environment that tries to devise new solutions that achieve balance with the environment for other purposes. The city is an organism and a living system in which form and function have an impact. Decisive on human satisfaction and conviction [23]. Sustainable urban design is defined as "a continuous process over time that begins long before urban development and continues for a long time after its completion. Conservation, individual requirements and collective awareness". Sustainable places are where adaptation and change processes take place in a positive and integrated manner to achieve a better quality built environment. These are places where all levels of development are achieved and what is required to make wide and long-term decisions [22]. The concept seeks to enable the natural processes of life to remain intact and continue to function along with improving the quality of life and the well-being of the community. Urban design adopts a systematic reorganization Environmental, social and economic goals that promote the long-term health of natural systems and the vitality of urban communities. The concept of sustainable urban design requires a comprehensive framework of new urban design principles to enhance the sustainability of cities [2] The main pillars of sustainability: The three main pillars of sustainability emanating from the World Conference on Sustainable Development Our common future document is the capacity for social, economic and environmental sustainability. However, the list was modified shortly afterwards to include culture and governance as important sustainability measures. [13].

Strategies of sustainable urban design

Urban interventions are usually adopted to deal with urban environments to overcome problems in urban areas, but they often appear in different parts of the world side effects such as social problems caused by the destruction of existing social networks, exclusion of vulnerable groups in local communities, exclusion of vulnerable groups in society and other negative effects in Living environment development. This has stimulated a more effective approach as modern intervention approaches have evolved and become more interconnected with the concepts of sustainability, ownership values, promoting entrepreneurship, as well as attracting private investment. Create sustainable urban areas with high quality. [11]

Sustainable Urban Revitalization

Urban revitalization dates back to the forties and fifties of the last century, during this period the preservation of historical buildings of special importance such as castles, palaces and churches was shortened, Urban revitalization is defined as: "Achieving a satisfactory balance between the laws of economic development and the needs and rights of the population and improve the city's value as a public good". [18]. Doratli defined revitalization in its simplest form as "the process by which the services provided by the urban fabric do not match with the historical and contemporary requirement, The mismatch may have a physical source or economic activities within the urban fabric". In this case, two types of activation are required:

- Physical revitalization: adapting the historical fabric to contemporary demands through various modes of renewal.
- Economic revitalization: the purposeful exploitation of improved areas. It has identified three strategic approaches to urban social and economic revitalization, which are:
 1. Functional restructuring: arising from changes in the area through the introduction of new uses and activities to replace the old ones
 2. Functional diversification: restructuring that brings new uses able to support the current economic base.
 3. Functional Refresh: Current uses continue, with more effective activation.

Sustainable urban renewal

Zijum defined sustainable urban renewal as "a commitment to a sustainable environment, maintaining economic sustainability as a driving force, and achieving social sustainability by integrating sustainable development with concepts of urban renewal, based on participation and decision-making by multiple stakeholders from the bottom to the top, through measures Such as the restoration of buildings and the redevelopment of land, to improve the appearance and significance of the city in a long-term, effective and high-quality manner and to keep pace with the pace of adaptation and technological innovation" [26]. Wang, Shen, Zheng explained that in order to achieve sustainable urban renewal, it is to properly address the two systems that make up the city, considering that the city is a spatio-structural and social system and consists of two sub-systems: the planning sub-system and the social-sub system The city planning system consists of all the physical elements of the city, including the environmental aspects that make up the regional structure, land, heritage buildings, housing, and infrastructure. A social system represents residents, users, and stakeholders [25].

The principles of sustainable urban design clearly relate to the aspects of contemporary urban renewal in the transformation of cities, and the principles of the integrative urban design tool must be integrated into the renewal to achieve sustainable urban renewal. These principles are:

1. A strategic framework for renewal must be provided in a rational manner
2. It should integrate different levels of governance, policies and legislation
3. It should be inclusive of stakeholders at the local, regional and national levels
4. It should reinforce and develop a specific character and identity of the place [4]

Sustainable conservation

Urban conservation is the conservation of traditions, social and cultural aspects, as well as the improvement of the historical material Thus, sustainable places are places that have been walked to support sustainable living with a focus on the economic, social and environmental aspects. This is characteristic of the revival of heritage and historical areas and thus tend to represent a variety of higher values of the city's identity [12]. Lichfield identifies two main drivers for urban conservation, which are to consider the built heritage as a resource for continued use by the current generation, thus avoiding the need to replace it with new investment resources and to conserve the irreplaceable value for the current and future generation, and the other reason is: the commitment that any contemporary society feels to hand over its heritage To the urban culture to future generations, the value of the resources is the value of preserving historical reserves as more resources, and this is a sustainable approach. As for the responsibility towards others, it is another value towards others [17]. Conservation can be classified according to the system of form and moral values into:

1. Conserved the formal features: It is the most common method and in general it is classified into the classical conservation, which is the conservation of an existing building or the reproduction of the formal features, and the second partial conservation is the conservation of certain elements or relationships.
2. Conservation moral values: Conserving and supporting the original function, as in the case of the renewal of Medina in Saudi Arabia
3. Conservation of context: It is divided into a formal context and is conserved by maintaining organizational relationships or formal vocabulary, and secondly, the moral context is achieved by strengthening the overall comprehensive meaning of a group of the formal vocabulary. [6]

Sustainable rehabilitation

Rehabilitation can be defined as "The repair and restoration of the natural and man-made environment". Rehabilitation is applicable in areas where buildings are generally in good structural condition but have deteriorated due to neglect and work to adapt old buildings to current life and acceptable modern standards, and that citizen participation is important in all stages of rehabilitation. Rehabilitation can also be done in two separate ways: gentrification and incumbent upgrading. Upgrading is defined as "The process that attracts the middle and upper class of individuals to housing in the area and replaces the former working class residents and they are attracted to it due to its proximity to the central commercial areas". Through the current upgrading process, keeping the indigenous population and investing their time, money and energy in renovating their buildings and improving their social conditions. It generates greater pride in the region by its residents, halts the decline caused by under-investment, and reduces environmental concerns. [20]

Sustainable Redevelopment

Redevelopment consists of removing existing buildings and reusing land to implement new projects. This approach is applied in areas where buildings are in a state of serious deterioration and have no protective value or do not provide satisfactory living conditions. Demolition may be for whole blocks or small parts to ensure the comfort and safety of residents in the future, and among its advantages, offers new commercial activities and higher incomes. It also leads to population density and improvement of services and infrastructure, but it carries high social and environmental costs, as it leads to the demolition of architectural environments, the sacrifice of the cultural heritage of society and the destruction of viable neighborhoods, which deprives people of valuable heritage resources. It contributes to the impoverishment of the indigenous population. In most Western countries, redevelopment is ignored as a means of renovating the history and heritage city centers, yet it is used in many developing countries through the removal of slums and reconstruction to improve housing conditions and modernize the interior [10]

Sustainable Urban Regeneration

Urban regeneration goes beyond the aspirations, goals, and achievements of urban renewal, and couch sees it as a process of physical change, urban development (redevelopment), and a process of revitalization (rehabilitation), meaning any approach adopted in the long term to address the problems facing towns and cities [19]. Urban regeneration defines a comprehensive and integrated vision and action, which leads to solving urban problems and seeks a permanent improvement in the economic, physical, social and environmental conditions of the area that has undergone change. Urban regeneration aims to transform the nature of a city or area through the participation of local residents and stakeholders to achieve a number of goals and objectives as a means of enhancing a sense of solidarity and thus identity. There is a relationship between urban regeneration and identity, in addition, the built environment, social fabric and urban spaces within the historic urban structure are upgraded and all work to increase their adoption as places for public gatherings and exchange, and thus increase social interaction and cohesion among citizens. And the feeling of belonging within the spirit of the past, contributes to raising the level of its environment and the economic, social and cultural quality to play the role of the main engine of change [8]. The urban heritage is also an essential tool in the formation of the brand of the place if it is activated by conserving and revitalizing it through the re-employment of the urban heritage, which plays a vital role in its marketing as in Arab cities such as Damascus ,Aleppo ,fez, Marrakesh and medina [5]

Table 1: Urban design strategies with sustainable approach , based on [19] and researcher

	1960 revitalisation	1970 Urban renewal	1990 regeneration
Definition	Achieving a satisfactory balance between the laws of economic development and the needs and rights of the population and enhancing the value of the city as a public good	Conservation: is the conservation of traditions, social and cultural aspects, as well as the improvement of the historical material Thus, sustaine focus on the economic, social and environmental aspects. Rehabilitation: the repair and restoration of the natural and man-made environment in good structural condition but have deteriorated due to neglect and work to adapt old buildings to current life and acceptable modern standards, and that citizen participation is It is important in all stages of rehabilitation.	A comprehensive and integrated vision and action, which leads to solving urban problems and seeks a permanent improvement in the economic, physical, social and environmental conditions of the area that has undergone change.
		Redevelopment 1980: consists of removing existing buildings and reusing land to implement new projects.	
Sustainable dimension :			
Social approach	Social and welfare improvement	Community based action and greater improvement	Emphasis on the role of community
Economic approach	Continuing from 1950 with growing influence of private investment	Encourage public sector and growth of private, and Providing job opportunities and improving tourism	Balance between public and private investment
Environment approach	Selective improvement	Environmental improvement ,and growth of attention for environmental approach	Wide vision of environment sustainability
Cultural approach	the adaptation of the historical fabric to contemporary requirements through different modes of renewal, with parallel rehabilitation of existing area	Preserving the urban heritage and reusing it to suit the developments of life and create a sense of place and community identity	There is a relationship between urban regeneration and identity, creating places for public gatherings and exchange, thus increasing social interaction and cohesion among citizens

The heritage city and importance of heritage in urban sustainability

Heritage is defined as “a general and broad concept that includes the natural and cultural environment. It includes the coordination of the land, places, sites and built environments, as well as biological diversity, past and continuing cultural practices, cognitive and life experiences. Heritage records and expresses the processes extending through time and developments that constitute the core of the original local identity The diverse national and regional so that they represent components intertwined with modern life.” The heritage is of several types, including urban, architectural, archaeological, cultural, and natural [16]. As for the city, it is a very successful and attractive social organization formula, even in the worst cases. It cannot be considered just a geographical scene. It includes a set of economic, social and cultural dimensions embedded in a specific spatial unit. Therefore, it is a multidimensional living entity, represented by:

- The city as a spatial concept - is the settlement of the population within a certain scope
- The city is an economic concept - cities are viewed historically and globally as an economic phenomenon

- The city is a social concept - because it is closely related to people, and that cities are not only a material aspect, but center around people
- The city is a cultural concept - because it contains a collective memory and as a product of myths and narratives, it is stored and transmitted across places and ultimately the sense of the city and cultural identity among the population [24]. Thus, the historical and heritage environments consist of tangible material data represented by human products over time, such as houses of residence, places of worship, baths, markets...etc, and intangible data related to anthropology, including the mythical and superstitious values they contain that express human culture and folklore, in addition to social data [15]. At the 2013 UNESCO conference in China entitled "Culture: the key to sustainable development" on culture and development, It calls for the integration of culture into the urban development agenda and the role of culture and heritage to play a more central role and its role in economic development, poverty reduction and social interaction, and calls Also for the role of heritage in a sense of place from one generation to another and as a crucible for creativity. It is necessary to integrate cultural heritage preservation programs with the sustainable development of historic urban areas, given that cultural heritage has value in enhancing the sustainability of cities through:
 - Being an engine of economic development
 - Cultural heritage as an enabler of social cohesion, inclusion and equality
 - Improving the quality of life and the sustainability of urban cities [14]

Cities witness many challenges and problems, such as housing density, migration, deteriorating infrastructure, population increase, unhealthy environment, wars, terrorism and political conflicts, unemployment, poverty [3]. The challenges of continuity of the past for the future emerge, and are not only confronted with social, economic, political and environmental challenges as well, but also terrible risks from spatial planning, urban management, maintenance and restoration. The overall challenge is how to integrate identities Urbanism in the contemporary environment and urban transformations [9].

Case study

Hafsia Quarter in tunis

The Hafsia quarter is the former Jewish neighborhood in Tunisia, which is located to the east of the old city center. It is characterized by a traditional narrow style of alleys, houses and courtyards, and has aesthetic and historical value. The old city, of which the Hafsia quarter is a part, was internationally recognized for its exceptional value and inscribed on the World Heritage List in 1979. It won the Aga Khan Award in 1983 and in 1995 for its commercial potential and the restoration of residential life in a former deserted area and as a new approach to urban renovation projects. During the colonial period, its residents began to move to the modern parts of the city. In 1928, the French authorities announced that the part was diseased and posed a danger to public health, in addition to the demolition of many buildings between 1933-1939 and the destruction of the city as a result of the bombing during World War II. Urban interventions in the Hafsia neighborhood were in two phases, but the first phase faced a strict popular revolution and the second phase began, which sought to develop the city under the vision of a comprehensive multidisciplinary renewal that helps to recommend future planning efforts in the city under the auspices of UNESCO and ASM). [11]

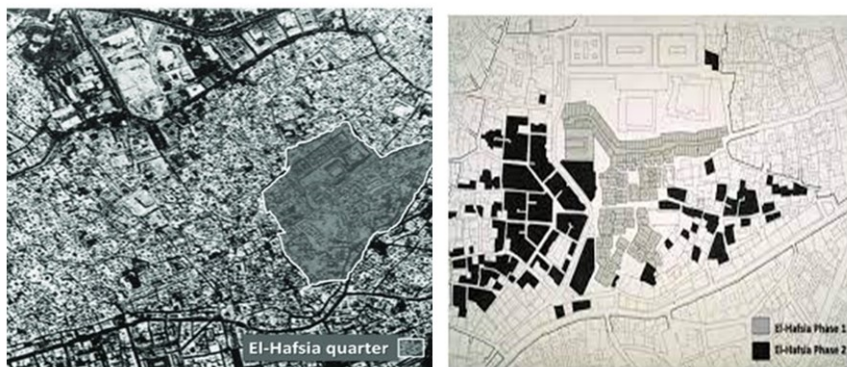


Figure 1: El - hafsia quarter renovation in phase 1 and phase 2

Strategies for sustainable urban design in the Hafsia quarter project

A combination of urban renewal policies were followed and according to a comprehensive integrated vision to achieve social, cultural, environmental and economic goals. The project included three basic components: 1- Infrastructure, which includes improving facilities and developing the road network and its services, 2- Rehabilitation and restoration of degraded housing in an appropriate manner, 3- Reconstruction, including: That construction on deserted land, sites that have been demolished, collective housing construction, commercial uses, offices, car parks, and public services. [11]

The project follows the following procedures to achieve the vision:

- Improving infrastructure, sanitation and public lighting services
- Maintaining sound buildings and removing damaged and deteriorating buildings
- Rehabilitation of residential buildings while reducing population density
- Providing the neighborhood with social and economic facilities to sustain life and increase the neighborhood's vitality
- Reviving traditional cultural activities and craftsmanship, which can create job opportunities
- Preserving the cultural identity of the area by adapting the local traditional style in the design of new buildings
- Reusing existing antiquities in cultural and social activities [8]

Aspects of sustainability in the urban renovation of the Hafsia quarter project

- **The social aspect:** the neighborhood is not viewed as a physical or functional entity, the accumulation of goods and commodities, or the pattern of land uses, because it is also a place for social interiors, sensory experiences and cultural expressions, and that residents are the catalysts of urban life in the city, and they constitute the social, cultural and economic systems that restore life to the physical environment, so the area was preserved with its original inhabitants, in addition to providing new job opportunities to raise the standard of living for its residents and providing basic social services to its residents. While encouraging the approach of participation and social integral [8]
- **The cultural aspect:** the intervention policies respected the values of the site and its historical layers, which contributed to enriching the city and the continuity of visual values in it and giving the spirit of the place and its civilized identity. Tourist and cultural. [11]

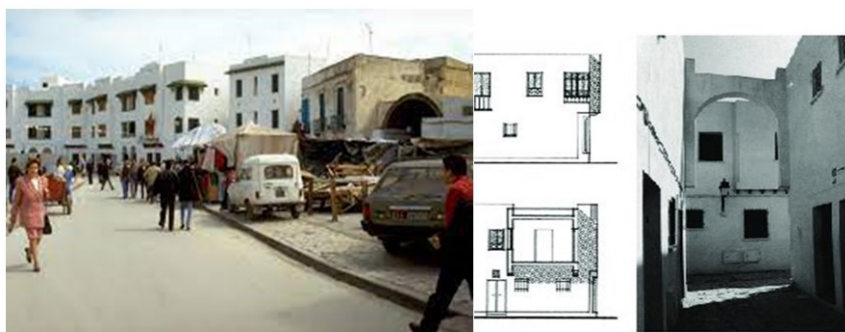


Figure 2: Sustainability of the social and culture aspects in hafsia quarter

- **The economic aspect:** Maintaining the increase in rents in the rehabilitated housing units at a maximum of 18% of the average monthly income. Establishing new commercial and craft activities to increase employment opportunities by building 700 square meters of new shops and second-hand clothing markets. Selling 12000 square meters of serviced land to developers From the private sector to build new housing at market price to provide mutual support for the project and diversify the social and economic characteristics of the neighborhood [21]

- The environmental aspect: Although green spaces were not established, it positively contributed to improving the environmental conditions and eliminating the abandoned spaces that were the focus of pollution, in addition to improving the infrastructure that helped protect public health. And the new residential buildings that were constructed, 400 new housing units, adopt the traditional model of two-story blocks arranged around a central space, allowing the entry of air and natural lighting, using traditional architectural elements such as the Mashrabiya, partially covered streets and prominent corners as in the figure [12]



Figure 3: Sustainability of the environment and economic aspects in Hafsia quarter

Table 2: Strategies of sustainable urban design in urban interventions of Hafsia quarter

	Sustainable revitalization	A revitalization plan by the Sovereign Society de la Medina of Tunis (ASM) of rebuilding public squares and restoring monuments and directing the public and private sector in implementing conservation projects to achieve quality of life in the region and to achieve the objectives of the stakeholders.
Sustainable	rehabilitation	Rehabilitation of degraded housing that can be maintained and restored, improving facilities, public services, infrastructure, road network and its services, while improving living conditions and job requirements and providing new job opportunities.
Urban	Redevelopment	The reconstruction of this residential and commercial sector ,new low-income dwellings, combined with offices, shops and a market, into a surrounding area of traditional courtyard houses on narrow winding streets, and to the west and south by modern constructions [1]
Renewal	Conservation	Conserving the historical character and cultural heritage of the neighborhood to give the place its own spirit and identity. In addition to the establishment of new units in the traditional city character with harmonious relations with the traditional urban fabric.
	Sustainable regeneration	A comprehensive and integrated vision and action that seeks improvement in economic, social, environmental and cultural conditions through the participation of stakeholders, a bottom-up approach, maintaining sustainable cultural and preserving traditional urban style and traditional building forms using architectural details and decorations and thus enhancing a sense of belonging and identity to achieve quality life in the area.

Conclusion

In order to achieve the sustainability of heritage cities and make them vibrant cities in the future in light of the challenges and urban degradation experienced in heritage cities, it is necessary to follow sustainable urban design strategies in the urban interventions of these cities and select the most appropriate strategic suite to the conditions of

each area. By analyzing and studying the urban renovation of the Hafsia quarter in Tunisia, the research found the possibility of mixing strategies according to the condition of the urban area, cultural, social and economic, physical, environmental. Sustainable rehabilitation can be used in areas that can be restored and maintained with the rehabilitation of roads, public squares and infrastructure, rehabilitation of the population socially and economically. The use of sustainable conservation in areas of high heritage value and the conservation of the place imprint for generations in the present and the future. Sustainable redevelopment is used in severely damaged and degraded places and in empty areas where it is possible to rebuild. As for sustainable urban revitalization, it can be used in areas where public spaces are being reconstructed and assets are conserved by relying more on the public sector as well as the private sector. Sustainable urban regeneration, it is a comprehensive approach that combines the above strategies and the most effective strategy to provide appropriate solutions to the economic, environmental, social and cultural conditions of historical cities, with the possibility of applying this in other heritage. Cities, including Iraqi cities, due to the challenges and urban transformations they are exposed to and maintain their architectural value and place imprint.

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