

SUSTAINABILITY OF HISTORICAL PARKS

Case study: Al-Azhar Park, Cairo - Egypt.

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ABSTRACT

The role of urban development is to repair the natural system by improving the efficiency and sustainability of parks. Historical park sustainability isn't only concerned with conservation but also with the pillars of sustainability while restoring environmental conservation areas. Furthermore, historic parks provide ways to meet the needs of modern visitors, as these needs do not meet in the earlier century, and these parks are typically prone to deterioration. This study intends to apply viable ways to revitalize historical parks, which are regarded as significant national and international heritage assets due to their influence on the citizens' socio-cultural heritage. This goal is accomplished through two major dimensions. The first explains the evolution of rehabilitating historical parks throughout the ages, defines park laws and charters, and the parks' needs for sustainability with the analytical study of Central Park - New York City. The second is an application of the strategic criteria to Al-Azhar Park in order to assess the park's sustainability.

KEYWORDS: Historical Parks, Sustainability, Sustainable Parks, Park Regeneration, Al-Azhar Park.

1. INTRODUCTION

Historic parks and gardens can be found in many metropolitan areas. Cities with a rich cultural history, including old parks and gardens, are more inclusive, diverse, and sustainable. International treaties, charters, and norms that have been incorporated into many nations' national legislation govern the preservation of historic gardens and parks. Historical gardens are the result of the efforts of people from all walks of life, including royals, noblemen, gardeners, and laypeople. As a result, the importance of these gardens in urban life varies across the globe, making it difficult to generalize interpretations of their design. Their conservation is thus safeguarded by continual observation and regular assessments of their constituents [1].

Participation of tourists in park management in historic parks can raise awareness and support conservation. It also encourages meaningful engagement between park officials and tourists. The importance of green space visitor use has grown in recent years as a result of modern trends in sustainable maintenance and resilient urban landscape development, which has resulted in resilient communities [2]. Many famous public parks across the world began as private gardens and they were turned into public parks while retaining fundamental design aspects and adjusting to societal needs. The transformation of these private gardens into public parks reflects historical and cultural advancements while keeping the unique landscape character. As a result, historical parks are characterized by their past, which must be conserved for current and future generations in order to maintain a cultural connection with visitors that might otherwise be lost and forgotten [3].

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2. RESEARCH OBJECTIVE

This research aims to apply potential strategies to revive abandoned historical parks, which are considered of significant value to national and international heritage assets, due to their influence on the residents' socio-cultural heritage.

3. METHODOLOGY

First, the literature review investigates the history of parks as well as the rules implemented to support their growth. Second, the system of the Oregon Parks and Recreation Department (OPRD) is reviewed to better understand the criteria for park and open space sustainability. By identifying specific sustainable dimensions, the OPRD may guide the landscape design of urban parks to meet the sustainability requirements in terms of environmental, economic, and social sustainability. In addition to the analytical study of central park, NYC by using the dimensions of sustainability. The OPRD sustainable dimensions are used for an analytical review of El-Azhar Park concerning its certain choice as a local case study.

4. RESEARCH QUESTIONS

Nowadays, the whole world is moving towards achieving sustainability. This research is going to answer the following questions:

1. Is turning historical park to be sustainable park a necessity?
2. Is Al-Azhar Park a sustainable historical park?

5. LAWS AND REGULATIONS

The Venice Charter of 1964 was the first international treaty established to clarify the principles of safeguarding historical places. The most significant part is expanding the concept of a 'historical monument' from a single architectural work to cover all historical regions that reflect a given historical event, as well as the restoration definition. The objective of the record is to avoid disrupting historical works, finish the job of exploration, and create exact documentation of all preservation stages [4]. The Florence Charter, the first charter issued by the International ICOMOS-IFLA in 1982, particularly mentions historic gardens and their preservation, referring to them as "living monuments." A historic garden, according to the Florence Charter, is a historically or artistically significant architectural and horticultural combination, and the term 'historic garden' refers to both small gardens and big parks, whether formal or landscape [5]. The modern use of the historical gardens incorporates the materialized aesthetic, ecological, and social elements of the past. Prior to conservation, investigations must involve plans and various floras. All statues should not be moved, and maintenance work should be prioritized after public use. Once conserved, they must be followed up on and maintained, and public awareness of the value of historic gardens must be raised. The New Zealand Charter of 1992 emphasizes the objective of preservation, i.e., caring for historical sites and establishing conservation and maintenance measures. The 1993 Athens Conference proposes aesthetic adjustments to antique gardens and recommends maintaining old buildings using new means without change [6].

6. SUSTAINABLE HISTORICAL PARKS REQUIREMENTS

Parks provide a variety of environmental, social, and economic benefits that contribute considerably to sustainable city plans and provide a more comfortable environment than the park's surrounds. Because ambient temperatures are often associated to pollutant emissions, cooler ambient temperatures may aid in reducing pollutant emissions. Parks that replicate forest settings may boost carbon storage over time because a net amount of carbon can build in the soil in addition to the carbon stored in trees. Parks also aid in storm water management, with higher water discharge rates

in green urban areas than in other urban land uses. Parks have the potential to considerably minimize the environmental health risks connected with urban living and noise levels. As a social benefit, parks have a favorable impact on both physical and mental health. They encourage and improve physical activity, reduce stress, anxiety, and depression, and boost self-esteem, cognitive ability, and constructive social behaviors. Parks are viewed as a crucial component of community development rather than simply a place for recreation and relaxation. In an urban park setting, people from various social and racial backgrounds may be able to communicate and engage [7].

Parks can also be used as a teaching tool. Environmental education helps persons improve their attitudes, knowledge, and behavior in order to create more resilient habitats and communities. Historical parks are excellent locations for hands-on learning. Future generations will be encouraged and inspired, having learned knowledge and abilities through environmental conservation activities, if we promote a child's connection to nature through nature-based practices. Parks benefit a city's economy by increasing its appeal and making it a popular tourist destination, which creates revenue and jobs. Historical parks also improve tax revenue and the value of surrounding real estate developments [8]. The sustainable design of parks is one of the most effective strategies for resolving environmental challenges in urban settings. The long-term maintenance of distinct ecosystems to ensure that they continue to serve various roles in the future is referred to as sustainable park design. In practice, this should require adapting to local conditions, utilizing natural processes, ongoing park monitoring, and recreation management skills [9].

A sustainable public park can be planned using a variety of ways. Community engagement and shared social activity require social sustainability. For a community to have a high quality of life and be sustainable, all of its members' basic needs must be met. A socially sustainable community must be capable of building and maintaining park facilities that serve residents of all ages, skills, and socioeconomic backgrounds. Practices for social sustainability include reaching out to the needs of the community, including those of marginalized groups. Sustainability should engage all community members, not just those who can afford to pay for their own needs [10].

When addressing economic sustainability in the parks and recreation sector, deficits, the national debt, and debt-to-gross domestic product (DPG) ratios should be given less weight. Instead, this pillar should be focused on assuring a government agency's ability to continue performing public functions while protecting public assets. Government spending and its overall consequences, including those of the private sector and the local community, are critical components of economic sustainability. The public aims of government organizations include providing positive value, minimizing certain unpleasant impacts, and avoiding all adverse outcomes that are completely unbearable. Maintaining the financial viability of parks and recreation organizations prevents unacceptable results and assures the continuation of the agency's public goals [11].

Environmental sustainability promotes the ethical and practical use of resources for the long-term benefit of communities. It entails slowing down the exploitation of renewable resources, pollution, and non-renewable resource depletion to a long-term sustainable level. A sustainable park should collaborate with the ecology and its processes rather than working in isolation. Healthy ecosystems provide immediate benefits to the communities that surround and rely on them [12].

7. SUSTAINABLE SYSTEM TO MEASURE SUSTAINABLE PARKS ACCORDING TO OPRD

The Oregon Parks and Recreation Department (OPRD) is a strong advocate for environmentally friendly parks. Sustainable parks' major goals are to promote environmentally friendly behavior, extend the useful lives of park structures and infrastructure, and improve the surrounding environment. Table 1. Summarizes the sustainable (social, economic, and environmental) solutions used in parks, leisure centers, and open spaces, according to OPRD [13].

Table 1: Criteria for sustainable parks according to OPRD.

Criteria	Sub-Criteria
Social sustainability	Education and outreach
	Social interaction with the natural environment
	Public health
Economic sustainability	Park development
	Fiscal practices
Environmental sustainability	Air quality
	Erosion and sediment control
	Habitat enhancement and restoration
	Native plants
	Recycling
	Renewable energy
	Urban design, land use, green building and construction
	Utility reduction
Water resources and flood protection	

8. ANALYTICAL EXAMPLE: CENTRAL PARK – NEW YORK CITY, USA

Central Park has been the focal point of New York City for over 150 years. Built between 1858 and 1873, it is one of America's most significant works of art. The park can be found in Manhattan, New York. It covers 341ha [843 acres] and is surrounded on the east by Fifth Avenue, on the south by 59th Street, and on the north by 110th Street. There are 20 gates, with 18 of them having the same original design. There are also 36 bridges and arches with rustic themes. The most renowned bridge is the Bow Bridge, which spans Central Park's lake and connects the Ramble and Cherry Hill (See Fig.1.) [14].

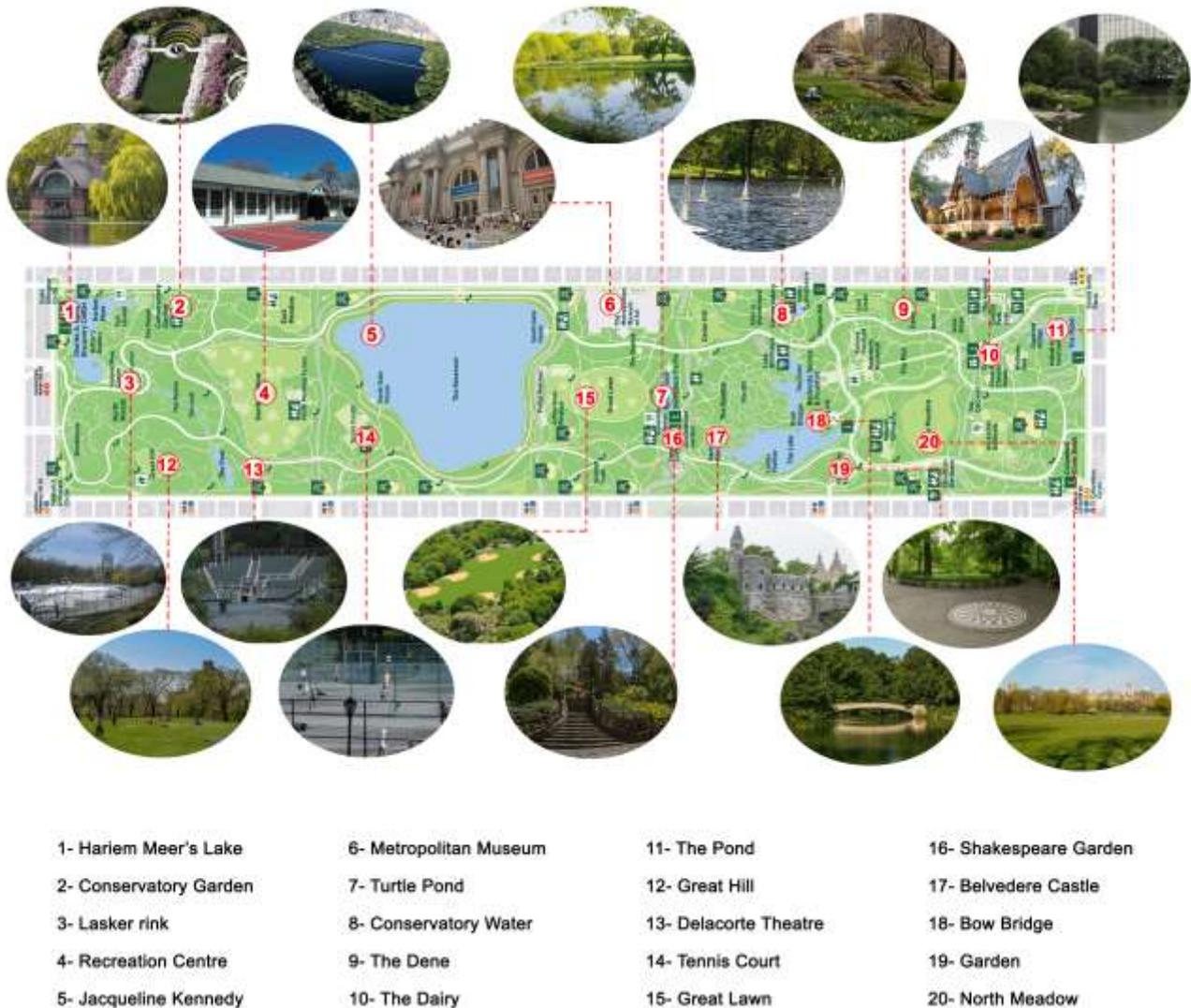


Figure 1. Central Park Components, the Map was acquired from the official website and the edits by the authors.

Source:

https://assets.centralparknyc.org/media/images/CPCWeb_Downloadablemaps_2022_GeneralCPMap_Final.pdf and <https://www.centralparknyc.org/>

From 1858 to 1960, the park experienced significant damage. Robert Moss was fixing bridges and collecting donations when he resigned from his job as an official in 1934. Following then, the park deteriorated once more (See Fig.2. (a), (b), and (C)). The Central Park Conservatory was founded in 1980 to recruit volunteers. Documents for rehabilitating archaeological sites and replenishing tree areas have been created by the Conservatory [15].



(A)

(B)

(C)

Figure 2. It shows various areas of Central Park- in New York City over the years. (A) Central Park 1940s. Source: https://commons.wikimedia.org/wiki/File:Horseback_riding_in_Central_Park,_New_York_City,_May,_1940.jpg (B)

The great lawn 1970s. Source: <https://en.wikipedia.org/wiki/File:Great-lawn-before250.jpg> (C) Bethesda Fountain Plaza 2010. Source: https://commons.wikimedia.org/wiki/File:Bethesda_Fountain,_Central_Park,_New_York,_USA-1Aug2010.jpg

Table 2. reviews the Central Park Conservation Authority's most significant achievements from its inception to the present in order to preserve its original image on the one hand and improve and develop it on the other. The restoration and preservation plan was centered on the major goal of the contemporary field lift for each of the park's topography, while security considerations and user needs were studied as shown at table 3. These accomplishments can be classified into three categories: social, economic, and environmental [16].

Table 2: Dimensions and strategies for Central Park regeneration.

Dimensions	Strategies
Social sustainability	<ul style="list-style-type: none"> • Restoring the existing building and renovating all urban elements, such as seats, lighting fixtures, and paving patterns respecting the park's historical identity; • Reconstructing the pedestrian pathway surrounding the Jacqueline Kennedy reservoir; • Restoring the fence surrounding the reservoir with the same form of solid steel; • Adding 1,500 lighting fixtures and renovating the infrastructure; • Restoring all gates, playgrounds and reconstructing wooden pergolas; • Increasing people's awareness by realizing the parks' importance and providing educational sessions.
Economic sustainability	<ul style="list-style-type: none"> • Providing special groups to monitor and maintain the garden, like the Friends of the Conservatory Garden and the Woodland Management Advisory Board, which are responsible for all landscape areas 53 ha. [130 acres]; • Dividing the park into 49 zones; each zone managed by a supervisor trained in agricultural work; • Training several volunteers in the maintenance work.

Environmental sustainability

- Making a list of the number of trees found, which was 26,000 trees, identifying their ages, sizes, and types;
- Planting 12,000 types of different plants, 1,400 trees, 7,500 flowers, and replacing 25 trees after their death;
- Renovating the Dairy and the Belvedere Castle, and coordinating the site around them;
- Restoring the Fountain of Cherry Hill, Bethesda, and three fountains in the Conservatory Garden;
- Renovating the area of Sheep Meadow and restoring the site around Harlem Meer;
- Restoring all bridges and arches, which extended over 130 years, rebuilding Bow Bridge;
- Expanding Shakespeare Garden and paving the pathways;
- Restoring the site around the Obelisk and Turtle Pond located in the Ramble.

Table 3: Area's in Central Park before and after development.

Dimensions	Areas' name	Areas' Before Development	Areas' After Development
Social sustainability	Bethesda Fountain		
	North meadow		
Economic sustainability	Belvedere Castle		

	Charles A. Dana Discovery Center		
	Conservatory Garden		
	The Mall		
Environmental sustainability	The Great Hill		
	Azalia Pond		

All pictures were gathered from open-access sources and edits by the authors.

Source: <https://www.6sqft.com/see-how-much-central-park-has-changed-since-the-80s-in-these-before-and-after-photos/>

9. CASE STUDY: AL-AZHAR PARK – CAIRO, EGYPT

Al-Azhar Park was picked for various reasons. First, according to the Project for Public Spaces, Al-Azhar Park is rated as one of the world's 60 great public spaces. Second, The Park was developed by the Historic Cities Support Program of the Aga Khan Trust for Culture in March 2005 so; the project is seen as a driving force for long-term social, economic, and environmental sustainability. Third, Al-Azhar Park on Al-Darassa spans 30 hectares and is considered as a 'green lung' for the city, as its largest designed greenspace. Al-Azhar Park is situated in Old Cairo district. It is encircled by several historical locations, it is considered among the major parks within Cairo (See Fig.3.)



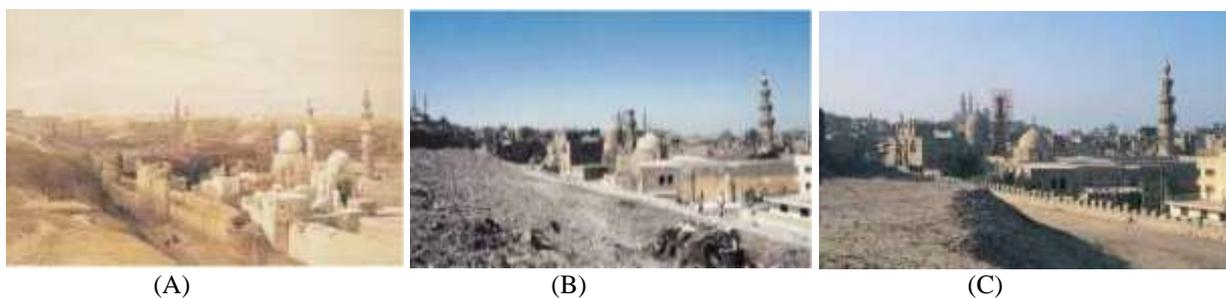
- | | | | |
|---|----------------------------|--------------------------|------------------------------|
| 1- Park entrance | 5- The telescope | 8- Bab el mahrouk | 11- Pizzeria restaurant |
| 2- Royal Palm Promenade | 6- Ayyubid historical wall | 9- The amphitheater | 12- Citadel view restaurant |
| 3- Mama restaurant in front of the lake | 7- Food court | 10- Children's play area | 13- Darassa parking entrance |
| 4- Masrawyca café | | | |

Figure 3. Al-Azhar Park Components, the Map was acquired from the official website and the edits by the authors.

Source: <https://azharpark.com/>

Since the foundation of Cairo, the collapse and demolition of man-made structures have increased huge amounts of debris to the total amount of quantum of fill through which the city rests upon. To the extent that large parts of historic Cairo lies on the fill from earlier periods. In addition to that it was clear that Cairo was in deep need of more green spaces according to a study that have found out that the amount of green space per inhabitant was roughly equivalent to the size of a footprint which is one of the lowest ratios in the world. The description the heights of debris were high to the extent that they hid the high walls surrounding old Cairo [17].

Previously a municipal rubbish dump for about 500 years, approximately 80,000 truckload of debris had to be removed before construction started and in the process a 12th century Ayyubid city wall of Cairo that was built during the reign of Salah el-Din, as well as some valuable stones with hieroglyphic texts were uncovered [18].



(A)

(B)

(C)

Figure 4. The southern section of the Ayyubid city wall and the adjacent Mosques. (A) Conditions in the 19th century. (B) Conditions in 1992 show the wall buried beneath heaps of rubble and debris. (C) The wall emerges during the site works in 2000. Source: (Aga Khan Foundation, 2003)

The origins of Al-Azhar Park project date to 1984, when the Aga Khan Award for Architecture organized a conference on the subject of The Expanding Metropolis: Coping with the Urban Growth of Cairo. During this time the city was confronted by contemporary development challenges such as population pressures, a decline in the quality of housing and other problems that are related to the previous two. During that conference His Highness the Aga Khan announced his decision to finance the creation of a park for the citizens of the Egyptian capital. The park is considered by local authorities, the developers and the planning and the design team to be a catalyst for the urban renewal for one of the most congested cities of the world. It offers better chances for social, economic, and cultural sustainability for the residents of the El-Darb el Ahmar [19].

The Historic Cities Support Program (HCSP) which is a branch of Aga Khan Trust for Culture has determined its main principle of this program which is improving the quality of life of citizens through investment in their cultural heritage and rehabilitation of architecturally significant structures. At the beginning the main aim was to provide the historic area with an urgent needed green space at the center of this historic agglomeration. The recovering of 1.3 Kilometers of historic wall has resulted to another aim which is offering a new "face" to historic city as seen from the park [20].

Table 4: Dimensions and strategies for Al-Azhar Park regeneration.

Dimensions	Strategies
Social sustainability	<ul style="list-style-type: none"> • Providing social programs and healthcare services for the poor and overpopulated neighborhood. • Distributing main items location and paths in the park to integrate with the surrounding environment, especially the old historic zone. • Preserving and restoring history heritage through the redevelopment of the Darb Al Ahmar district and the restoration of the Ayyubid wall. • Offering recreational space for citizens and Visitors. • Planning a multitude of activities such as a children's play area, a theater, and playing fields.
Economic sustainability	<ul style="list-style-type: none"> • Developing certain crafts and job opportunities for the local people living around the park. • Collecting revenue from the entry, parking, and restaurant fees. • Improving the aesthetic and safety neighborhood. • Providing microcredit programs for neighboring residents to restore dwellings and improve existing new businesses.
Environmental sustainability	<ul style="list-style-type: none"> • Providing panoramic views to show the historical monuments to the visitors • Providing a variety of trees to give shade in the summer in seats' places to avoid the high temperature. • Planting a variety of plants. • Designing the layout of the park to cope with all the site challenges, starting with the three water tanks and the big slopes on the eastern side of the park. • Creating visual stimulation by changing the plants' color and offering a mix of flowers at the entrance to determine the boundaries and directing the path of visitors.

10. DISCUSSION

Al-Azhar Park represents an essential aspect of the city's cultural legacy, and these public places hold layers of the city's history. As stated by the framework used in Table 4 and the historical overview, the study showed that Al-Azhar Park achieved most of the sustainability strategies but still many sustainability strategies aren't entirely achieved, in the environmental dimension, there is no attention being paid to practice any energy savings, there is no usage of renewable sources of energy throughout the park and there is no recycling made for the Wastewater. Regarding the social dimension, signs are not well distributed and the lettering of the signs is too small. Concerning the economic dimension, fertilizers are being used in the park decreasing its Ecological Performance.

11. RESULTS

The following key features can be extracted from Al-Azhar Park in Cairo, Egypt:

1. Development in historical elements is sometimes essential as long as it fits the needs of users on the one hand and does not have a detrimental impact on the historical worth of those elements on the other.
2. The use of current methods, such as computer programs, facilitates some activities linked to park element registration and follow-up while executing preservation, maintenance work, and yearly report monitoring.
3. Launch a combined physical and social rehabilitation process in the surrounding area of the park The Darb-El Ahmar district.
4. Lack of visitors' awareness of realizing the parks' importance and lack of educational sessions.
5. The park has social, economic and environmental performance in terms of sustainable use.

12. CONCLUSION

Parks are essential components of the urban ecosystem, serving as both urban core areas and open, mixed-use recreational spaces. Furthermore, as a component of the open space system, it serves an important functional role as a component of the landscape habitat. Therefore, sustainable parks will be a critical component in transforming and improving our lives and cities if historical parks can transition from their current, primarily recreational, role to a new role as a catalyst for community development and enhancement.

The study demonstrates that Al-Azhar Park meets most of the sustainability requirements on park's sustainability through reaching the access methodology to the three pillars of sustainability (social, environmental, and economic). Al-Azhar Park is considered a sustainable urban development project that proves its success as it was converted from a derelict wasteland site into a sustainable park. As well as, it's considered a successful model of how the park can interact with people's life, especially local users.

13. RECOMMENDATIONS

Based on the literature review analytical studies and follows the strategies used in Central Park, New York, the following recommendations can be suggested:

1. Reduce energy consumption by using solar energy and wind energy to power its buildings.
2. Implementing a maintenance system to manage the park's facilities.
3. Waste recycling and removing illegal landfills in the park.
4. Increasing people's awareness by realizing the parks' importance and providing educational sessions.

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استدامة الحدائق التاريخية

دراسة حالة: حديقة الازهر، القاهرة، مصر.

المخلص :

يتمثل دور التنمية الحضرية في إصلاح النظام الطبيعي من خلال تحسين كفاءة واستدامة الحدائق. لا تتعلق استدامة المنتزهات التاريخية بالحفظ فحسب ، بل تتعلق أيضاً بأركان الاستدامة أثناء استعادة مناطق الحفاظ على البيئة. علاوة على ذلك ، توفر المنتزهات التاريخية طرقاً لتلبية احتياجات الزوار المعاصرين ، حيث لم يتم تلبية هذه الاحتياجات في القرن السابق ، وعادة ما تكون هذه الحدائق عرضة للتدهور. تهدف هذه الدراسة إلى تطبيق طرق قابلة للتطبيق لإعادة إحياء الحدائق التاريخية ، والتي تعتبر أصولاً تراثية وطنية ودولية مهمة نظرًا لتأثيرها على التراث الاجتماعي والثقافي للمواطنين. يتم تحقيق هذا الهدف من خلال بعدين رئيسيين. الأول يشرح تطور إعادة تأهيل المنتزهات التاريخية على مر العصور ، ويحدد قوانين ومواثيق المنتزهات ، واحتياجات المنتزهات من أجل الاستدامة مع دراسته تحليلية لحديقة سنترال بارك - مدينة نيويورك. والثاني هو تطبيق المعايير الاستراتيجية على حديقة الازهر من أجل تقييم استدامة الحديقة.

الكلمات الدالة: الحدائق التاريخية ، الاستدامة ، الحدائق المستدامة ، تجديد المنتزه ، حديقة الازهر ، القاهرة.