

ORIENTATION AND VISION FOR THE SUSTAINABILITY OF HERITAGE SITES, A CASE STUDY OF PORT SAID CITY

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Abstract

Achieving sustainability is one of the global visions for preserving human resources. Heritage is one of the most important resources that must be preserved and transferred to future generations. The city of Port Said is one of the most important cities that includes a number of natural and cultural heritage sites, Its natural heritage dates back to ancient Egyptian times, while its cultural heritage goes back to the opening of the Suez canal that connects the Mediterranean Sea with the Red Sea. This importance makes it necessary to monitor these sites and determine their values. Therefore, the study aims at highlighting the importance of heritage sites in Port Said. Then it develops a plan to manage these sites and to set priorities for intervention to preserve and maintain them in order to achieve the concept of sustainable development.

Keywords: Port Said; Heritage Sites; Sustainability; Natural Heritage

Introduction

Preservation works of heritage sites have developed, starting with extreme preservation and dealing with heritage buildings alone. Then the necessity of preserving the buildings and their surroundings has aroused and not dealing with them as individual buildings [1]. This was followed by the preservation of heritage sites with the development of the local community constituting the heritage environment [2].

Preservation works are not limited to protecting the aesthetic, heritage and cultural aspects only, but also they include developing the social and economic aspects of the local community in the heritage sites [3-5]. This stage is considered the first building block for the sustainable development of heritage sites.

Sustainable development is known as the kind of development that meets the needs of the present without negotiating the ability of future generations to meet their own needs [6, 7] and it is a three-dimensional, interconnected and interrelated development. These dimensions are the environmental, economic and social dimensions. Many issues related to the human, spiritual and ideological, social, cultural, economic, political, and environmental dimension interconnect with these three dimensions [8]. One of the most important means to achieve sustainable development through its cultural dimension is to care for and preserve heritage and heritage sites [9, 10].

On the other hand, heritage preservation and its management are considered one of the most important means to achieve the environmental, social and economic dimensions of

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sustainable development [11]. Therefore, it's found that the relationship between heritage preservation and sustainable development is a complementary reciprocal relationship.

Sustainability requires changing the way of dealing with heritage buildings. It includes, besides sustaining energy and conservation procedures, studying the historical aspects of the site before restoration and conservation works, with a continuous evaluation of the environmental impacts of these works [12].

Sustainability of the heritage sites can be achieved through achieving its three axes through the social development of their people in terms of providing better job opportunities and services and spreading cultural awareness among them [3]. In addition to achieving environmental development, considering that many heritage buildings are environmentally friendly buildings that provide their own resources. Thirdly, the development of economic aspects through the reuse of heritage buildings for beneficial uses that preserve buildings and integrate them into community life ensuring maintenance and its financing.

Another benefit from sustainability is employing and deepening heritage values and its vocabulary through using them in some new projects in a contemporary way especially in national projects. This way the continuity of these values and vocabulary will be achieved and saved from extinction and provide a pathway with architectural heritage [13].

Practical Development

The city of Port Said is one of the cities with heritage sites that require intervention to protect and preserve its authenticity. It is located in the northeast of Egypt (Fig. 1) in a privileged position at the northern entrance of the Suez Canal as it was built as part of the Suez canal project during the period from 1859 to 1869 [14].



Fig. 1. Satellite view of the city of Port Said (Google Earth ©) and detailed view

During the construction of the city, the universal maritime Suez Canal Company designed two neighborhoods (Fig. 2): Al-Sharq and Al-Arab.



Fig. 2. Al-Sharq (pink) and Al-Arab (blue) quarters (a) (Google Earth), the historic urban fabric in Alsharq quarter (b), and in Alarab quarter (c)

Al-Sharq [14] (The European quarter or Ali'frang) for the foreigners combines the European city planning and its architectural styles. It also houses the old Lighthouse and Suez Canal Authority Building in an Islamic architectural style [15]. Al-Arab neighborhood was for the Egyptians [14] which is famous for its old wooden buildings. Most of these buildings were built towards the end of the 19th and early of the 20th centuries with local architectural influences and materials [15].

Later, with the massive population of Port Said city, more neighborhoods were built [14]. It is clear from the architectural and cultural heritage of the city that there is an impact from the neighborhoods' cultures on the city and its inhabitants.

Characteristics of Heritage Sites in Port Said

The city of Port Said has many pictures of natural and cultural heritage (Fig. 3), which gave the city a special importance to make it a strong attraction destination for tourists and who are interested in heritage from inside and outside Egypt.

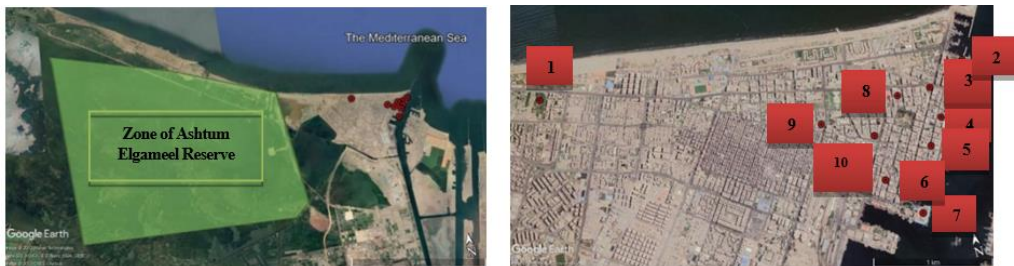


Fig. 3. The geographical distribution of (a) natural and (b) cultural heritage sites in Port Said city: 1. Commonwealth Cemeteries, 2. De Lesseps statue's base, 3. Kolovitch building, 4. Port Said Lighthouse, 5. French Poste, 6. Church of St. Eugenie, 7. Suez Canal Authority Building, 8. De Lesseps's villa, 9. Tawfiq Mosque, 10. Abbasid Mosque

One of the heritage sites in Port Said is the natural site of Ashtoum El-Gamil. Ashtoum El-Gamil Protectorat is a national park and a natural protected area which covers an area of 180km². The site was declared a nature reserve in 1988 [16] and the area is an important wintering place for numerous birds and most of the shallower areas are densely planted mainly with rooted plants [17] and about 50 species of plants have also been recorded within the Reserve [18].

In addition to Ashtoum El Gamil Reserve, Port Said has many cultural heritage sites located mainly in Al-Sharq and Al-Arab quarters. The most important archaeological sites in these two quarters - which the paper focuses on - are the base of the statue of De Lesseps [19], Port Said Lighthouse and the Building of the Suez Canal Authority (Fig. 4).



Fig. 4. Complete statue of De Lesseps (a) [22]; the base of the statue of De Lesseps (b), Port Said light house (c) and the Suez Canal Authority (d)

The base of the statue of De Lesseps is still located at the entrance of Suez Canal despite the lifting of the statue from it. Port Said Lighthouse [20] along with the Building of the Suez Canal Authority that was the first buildings used for the management of the Suez Canal and was opened in 1869. Both buildings merge the design style of the Arab-Islamic and European styles [21].

Examples of heritage buildings with a distinctive style at the European neighborhood (Al-Sharq) are the Kolovic Building, De Lesseps's Villa (Fig. 5) and the French Post Building (Fig. 6).



Fig. 5. The Kolovic Building (a) and De Lesseps's Villa (b)



Fig. 6. The French post office (1867- 1899), One of the French stamps used in Egypt with the image of the building (a) [23], the building at the present time(b) and the part marked with the name of the building and detailing of the remaining letters (c)

Port Said has also some heritage religious buildings of the Eugenie Church and the Tawfiq and Abbasid mosques.

Apart from this area and west of Port Said, there is one of the important sites known as the Commonwealth Tombs (Fig. 7), which attracts visitors from outside Egypt to visit their relatives, as Egypt has dedicated this site to be a permanent graveyard for allied soldiers who died during the Second World War (1914-1918) to perpetuate their memory.



Fig. 7. The Commonwealth Tombs

The Natural and Environmental Characteristics of Port Said City

Environmental conditions play an effective role in formulating and shaping archaeological and heritage buildings through geographical location, geological formations, topography and climate (heat, wind, rain). Climatic conditions and surrounding factors affect the extent of protection and preservation.

Port Said City is situated on the northeastern side of the Nile Delta between latitudes of 31°15'23.54"N and longitudes 32°17'2.8"E [24]. The Governorate of Port Said has a total area of about 1351 km² and is edged by Lake Manzala from the west and Lake Malaha from the east. The area consists of Pleistocene-Holocene rocks which are subdivided into two formations: thick layers of sands and pebbles at their base and shows some clay, and at the top basin fill with coastal sands and deposits from the Nile floods [25].

Lake district of Manzala was fertile and cultivated land, but these lands were reduced as a result of the earthquake that occurred in the late sixth century AD. The sea water submerged the sand dunes that separated the sea from that agricultural land and the water covered it year after year until the area was flooded [16].

Port-Said's climate is a Mediterranean one. The area is also characterized by high sun radiation most of the year. The macroclimate could be described as hot and humid while the microclimate is highly influenced by the location of Port-Said on the waterways that provide micro-climatic relief [26]. According to statistics, the warmest month (with the highest average of high temperature) is August (30.3°C). This causes a negative impact on the heritage buildings as well as causing no visitors to feel comfortable during these months. January is the month with the lowest average of high temperature is (17.4°C) which gives the city of Port Said a special importance as a tourist attraction during the winter seasons [27].

Relative humidity is an important climatic element for its influence on heritage buildings especially when it is associated with a rise in temperature. In Port Said, the highest rate of relative humidity is in the winter in December (69%). Then it gradually decreases until it reaches its lowest levels in the summer in April (64%) [27]. Rain falls on Port Said in the winter season as the wettest month (with the highest rainfall) is January (18mm) and driest months (with the lowest rainfall) are June, July and August (0.0mm) [27].

The prevailing wind direction is north during period of April to August. The west and southwest winds exist from September to March. The average wind velocity reaches 5.1m/s [26]. The monsoon creates steady strong winds from December to April, and calm winds from June to October. as it reach more than 38km/h during the months from November to April [28].

The Cultural, Economic and Social Characteristics of the Local Community

Besides the importance of the tangible cultural heritage, intangible cultural heritage should be preserved. It is a must to study the cultural, economic and social characteristics of the inhabitants of heritage sites as they are side by side the most important means of rehabilitation of heritage sites and achieving sustainable development.

Port Said has a rich intangible cultural heritage which varies between customs, traditions and folklore. One of the most important figures of intangible cultural heritage is the sesame that is a musical instrument and a band whose genesis has been linked to the digging of the Suez Canal. The Sesame is not the only band that Port Said is famous for. There is also the band (Al-Tanboora), which is named after a musical instrument whose paintings were found on the walls of the Pharaonic temples. It is an enlarged picture of sesame strings with a smaller size [14].

The basic economic activity of Port Said includes fishing and industries such as chemicals and food processing. Port Said is one of the important harbors in Egypt for exporting and importing and fuelling station for ships passing the Suez Canal waterway as well as a summer resort for Egyptians. Another economic resource in the Port Said area is the large natural gas reserves. Port Said has 76% of Egypt's natural gas reserves [26]. This economic policy and potentials accelerated the growth of the governorate. Port-Said became the third largest urban governorate in Egypt.

In terms of population, its population increased from few thousands in 1974 to 524,174 in 2002. Port-Said governorate extends over an area of approx 1351sq km (about 1.5 percent of Egypt), with an inhabited area of 72.07km² and population density of 7,273person/km² [26]. According to the detailed forms of the general population census, and according to the report issued by the Central Agency for Public Mobilization and Statistics for 2019, it is clear that the total population of Port Said Governorate is 764,499 (392,717 males and 371,782 females), and all of them are urban residents [29].

Such study should be used when studying the maintenance of the heritage sites because of the indications that it gives to the future of the site in terms of appreciation of the population growth. Thus, this helps in solving future problems and meeting the needs of the local population as well as taking advantage of them to serve the heritage sites and support the link between these sites and their residents.

Problems and Threats to Heritage Sites

Most of the time, heritage sites suffer from many problems that threaten their sustainability. Sometimes these problems are sustainable problems associated with the nature of the site itself and its local environment or as internal deterioration factors resulting from the building structural system or the building materials. Other problems are due to modernization adversely affecting heritage sites. In all cases, all problems and risks should be monitored to determine intervention priorities and mechanisms to ensure the sustainability of these sites.

Port-Said City is located in a very sensitive and fragile zone in Egypt. It is located on the border of two main plates; the African and Asian plates and on the tip of the Suez Canal which was dug along a large fracture. Previously, Port Said was close to a large lake named Manzella and as a result of urban expansion, this lake underwent substantial shrinkage. Therefore, most of the new buildings in Port-Said City are located on the filled land area of Manzella Lake which makes these buildings relatively unstable, in addition to the loading actions of the ships along its ports also might affect the building stability in Port-Said City [25].

Due to the fact that Port Said is located on the shore of the Mediterranean Sea, it suffers from the risk of rising water levels over the coming years. Sea level changes are caused by several natural phenomena; the primary ones are: ocean thermal expansion, glacial melting from Greenland and Antarctica and change in terrestrial storage.

It is predicted that, with global warming, global average sea levels increases over the years, as it ranges between 7 and 36cm by the 2050s and up to 30–80cm by 2100. People will be directly affected by rising sea levels in several ways. As seas rise, many areas of the coasts will be submerged with increasingly severe and frequent storms and wave damage. In addition, shoreline retreat will be accelerated. Expected disastrous flooding events will be caused by severe climate events such as heavy flooding, high tides, windstorms in combination with higher seas. Low gradient coastal landforms most susceptible to inundation include deltas, estuaries, beaches and barrier islands, and coral reefs. The Nile Delta in Egypt is one of the areas most vulnerable to these risks [30-32].

El Raey [33] explained that the potential effects of sea level rising include significant socioeconomic implications (Table 1), which may involve mass population displacement, from the delta. Other vulnerable coastal zones include the Mediterranean and Red Sea, which could suffer considerable damage to coral reef communities, shortages of water resources, loss of biodiversity, and loss of natural and cultural heritage. Manufacturing, transportation, and the residential sector are at the greatest risks from sea level rise. If sea level rise reaches 50 centimeters, from modeling the city would lose almost 7,000 jobs. But *El Raey's* study [33] did not estimate how many losses that heritage sites – located mainly in El Sharq and El Arab neighborhoods which are the closest neighbors to the sea - in port said might have in this case, which estimated at millions of millions of dollars.

However, these days, the fact that climate conditions around the world have improved due to the impact of the Corona pandemic, which resulted in lower rates of air pollution, cannot be overlooked.

Table 1. The Physical and Socioeconomic Losses Associated with a 0.5-Meter Sea Level Rise in ElSharq and ElArab quarters in Port Said [33]

Parameter	El Sharq	El Arab	Total	%	Million US\$
Beach area (km ²)	00.43	00.38	00.80	00.06	00.08
Urban area (km ²)	00.03	00.04	00.08	01.32	15.60
Industrial area (km ²)	00.02	00.00	00.02	04.25	08.50
Transport network (km ²)	10.00	07.00	17.00	08.65	03.40
Affected population	3968.00	16699.00	20667.00	03.89	--
Employment loss	953.00	4000.00	4953.00	03.88	--

In addition to the above-mentioned natural dangers that threaten the heritage sites of Port Said, natural heritage sites suffer from encroachment on marine life in the natural reserve through overfishing of fish resulting in a decrease in its types and numbers in the lake. Furthermore, the area of Manzala Lake decreased from 750,000 feddans or acres to 120,000 due to drying for the purpose of urban expansion, road construction, and canals' incision [18].

One of the most serious problems that cultural heritage sites may encounter is the interference between the authorities concerned with these sites. This is the case in the city of Port Said where we find that the buildings are either affiliated to the Ministry of Antiquities, with the Natural and Cultural Coordination Authority, or they are affiliated with private bodies such as the Suez Canal Building, which is affiliated with the Suez Canal Authority, or they are private individual properties. This overlap has resulted in the difficulty of dealing with heritage buildings in accordance with the international recommendations and charters. In some cases, there is a risk from losing these buildings according to the directions of their owners to demolish and rebuild modern buildings because they are not aware of their value and desire to benefit from their location.

This is in addition to the presence of large numbers of undocumented buildings, despite the fact that they represent one of the important examples of the Mediterranean architectural style [17].

In addition to the danger of modernization in dealing with whole neighborhoods such as Sharq and Al Arab neighborhoods as they are unique to their buildings and they represent important heritage zones. However, they suffer from development and modernization work without taking into account the heritage value of these buildings such as the heights of modern buildings, building on modern styles that are inconsistent to or compatible with heritage buildings in façade patterns, building materials, or architectural designs.

The Arab region is also considered one of the commercial districts in Port Said to which large numbers of visitors flock every day for the purpose of commercial transactions that affects the heritage character of the neighborhood and threatens heritage buildings.

As for the buildings registered as archaeological buildings such as the Port Said Lighthouse and the base of the De Lesseps statue, these are tourist attractions that lack employment in new uses that help integrating them with the surrounding community.

Means of sustaining heritage sites in Port Said

Restoration, Preservation and management works

The restoration and preservation works aim at preserving the heritage, managing the heritage sites and displaying them in a manner befitting their historical, architectural, artistic and aesthetic value [4, 5, 9, 34, 35]. Therefore, when dealing with heritage sites, it is necessary to search for the appropriate method [32]. With regard to heritage buildings, restoration and conservation procedures differ in different buildings depending on: whether they are private or public properties, or they are still in use or they lost their uses [33-37, 38]. Additionally, these procedures vary according to the buildings' need for restoration work between:

Very severe urgent cases: these are buildings that suffer from structural problems that presage the loss of some of their parts. In the city of Port Said, there are many heritage sites that need urgent intervention, such as the natural heritage area, as well as buildings with no definite ownership, whether they are private buildings of architectural or historical value, or buildings belonging to more than one competent authority and not affiliated with the Ministry of tourism and Antiquities, which results in flexibility in dealing with these buildings without taking into account their various values.

Moderately severe cases: these are residential buildings with value and located within Al-Sharq and Al-Arab neighborhoods. They are almost stable but require the necessary documentary studies, with the legalization of the nature of their use to be under the supervision of a competent authority concerned with heritage preservation, which determines the nature of the best use to preserve and not lose their values.

Normal conditions or buildings in good condition: these are the buildings where treating the deterioration phenomena caused by the deterioration factors during long periods (aging) is done. These types of buildings must be restored in a good condition as safe and sane as possible, with continuous monitoring to assess their condition and to manage any challenges or risks. This type of building applies to the building of the Suez Canal Authority, Port Said Lighthouse and the base of the De Lesseps statue.

Reusing heritage buildings

This procedure is one of the most important methods of preserving heritage buildings that have lost their main uses, as it helps preventing them from re-entering the cycle of damage especially those buildings that have received a lot of care and attention before.

The concept of re-use means using the building in its first use, for which it was established, that if the community needs this use while performing some necessary rehabilitation and development works to keep pace with the requirements of this time [4, 5, 9, 10, 14]. Or re-using the building in a new use that differs from its original use, imposed by the community's need and the condition of the building itself with making the necessary adjustments according to what is stipulated in international charters [1, 2, 4]. In both cases, reuse means primarily to preserve the building and revive it so that the hand of neglect does not extend to it [36-40].

As for the heritage buildings in Port Said, the best use depends on the nature of the original use of these buildings as the city of Port Said includes many valuable buildings and registered by the cabinet decree and its number reaches to 505 building inside three quarters (Al-Manakh, Al-Arab and Al-Sharq) [15]. The nature of its original uses varies between service buildings and the vast majority is residential buildings.

In the case of registering these buildings as archaeological or heritage buildings, they can be reused in the same original uses, but with the rationing of these uses so that they become under the supervision of the competent authorities that follow the evaluation process periodically and continually.

Defining the sustainability requirements for heritage sites

Reviewing and developing urban legislation and laws: it is necessary to review, re-evaluate and develop laws and legislations whether directly or indirectly related to conservation, upgrading and development work. That's to submit appropriate suggestions to the concerned authorities for modifying and updating with highlighting the appropriate heritage values to the inhabitants and linked to society [36, 37].

Article 16 of the Antiquities Protection Law of 2010 has organized the necessity of arranging the Juxtaposition rights of real estate adjacent to the archaeological sites and historical buildings to ensure the preservation of their artistic properties or their general appearance.

Articles [25-27] clarifies that building in the places or lands adjacent to the archaeological sites may only be authorized in accordance with the special requirements issued by the Supreme Council for Planning and Urban Development based on the proposal of the Minister and in a manner that ensures the construction of the building in an appropriate manner that does not overwhelm the monument or affect its appearance and ensure an appropriate urban

with observing the archaeological and historical environment, specifications and heights that guarantee its protection [38].

Therefore, a buffer zone for heritage sites in Port Said should be defined or established so that this zone is taken into consideration when proposing any development or rehabilitation works for these sites.

The need for society participation for preservation and rehabilitation: The most important stage in achieving sustainable development is to involve society in these plans, Accordingly, awareness and culture should be raised among the residents of the city of Port Said with the importance and value of their natural and cultural heritage sites. It's also necessary to unify the concerned supervising authorities in the management plans to create a competent authority concerned with conservation work that has all powers to take decisions when dealing with heritage sites and be under the supervision of one of the government agencies (the Ministry of Tourism and Antiquities).

Concerning archaeological buildings such as the Port Said Lighthouse and the De Lesseps statue base, the development work that will be carried out for their upgrading should be followed with the rehabilitation of such buildings by restoring and reusing them if possible so that this procedure ensures the long-term maintenance and provides a financial return that contributes to their sustainable conservation.

Regarding the base of the De Lesseps statue, it's found that the community participation in the management and development plans of heritage sites imposed the existence of the base without its statue which was fixed on it, as the local community refused to return the statue to its place because of the painful psychological effects that this would cause. The specialists were only respecting the desire of the local community to achieve affiliation and integrate them into management plans and consider other alternatives to preserve the statue and its value that relates to its location.

Defining and developing heritage vocabulary and values to incorporate into new projects: When preparing development plans, it is necessary to state some plots of land in accordance with the study and analysis of the site. These plots are identified as new projects and buildings that take into account the use of some vocabulary and heritage values in them as these projects ensure communication and continuity with the architectural heritage [37].

In addition to highlighting a group of architectural elements (Fig. 8) that can be used to connect modern and heritage constructions in the same urban such as the use of wooden canopy on the facades of some homes, the use of semi-circular and pointed arches and the use of plaster to implement some plant decorations as cornices on the facades.

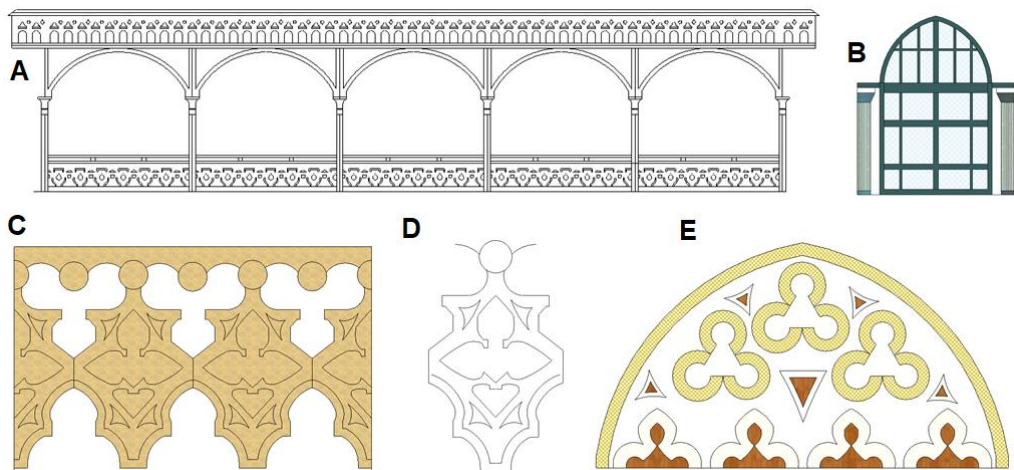


Fig. 8. Proposed openings of modern buildings within the urban of heritage buildings and some of the proposed decorative units to give Port Said's touches

Conclusions

Port Said city abounds with many values such as its historical depth and strategic location which necessitates its care and urgent management. It also includes many natural and cultural heritage sites that call for speedy intervention to reduce the risks and factors that negatively affect them. Natural heritage sites are exposed to a set of risks that prevent them from being preserved such as the difficulty of coordination between different authorities after declaring the site a natural reserve and encroaching upon the marine life in addition to declining the area of Lake Manzala. The same applies to cultural heritage sites where a few of these sites have received a degree of restoration and conservation works while many of them still suffer from many structural and architectural problems that portend the loss of many of their elements over time. In addition to some buildings with private properties that allow the freedom to treat from their owners without taking into account their heritage values.

Achieving sustainability requires the necessity of preserving heritage sites by clarifying their borders, organizing buffer zones for them, and studying their characteristics and needs while limiting the expansion of the urban fabric at the expense of heritage sites as well as taking into account the general nature and not creating disharmony, by controlling the heights of any new buildings at the site as well as obtaining consistency of their facades and taking the usage of the surrounding land into account.

To confirm the concepts of sustainable development, it is necessary to involve the community in management plans and to support the relationship between heritage sites and their societies. It is also essential to raise awareness of the importance of heritage and a sense of belonging to heritage sites among the local inhabitants through organizing educational seminars and workshops. This can also be done via the use of various means of media to raise a generation that awares with this heritage and its value.

In addition to the need to take advantage of the intangible heritage and revive it by organizing and displaying it in local and international festivals and celebrations to exhibit the site and revive the traditions and customs of the people of the city of Port Said as well as taking advantage of the economic and social characteristics of the city's residents and employing them to serve the site's management plan.

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