Assessing heritage reuse interventions in the Gulf Countries

S Mazzetto
Assistant Professor College of Architecture and Design, Department of Architecture
smazzetto@psu.edu.sa

Abstract. The extraordinary developments and massive urban growth that have plasmid many Gulf countries due to the massive oil exportation have raised many questions regarding the directions of change for many new global cities in the Middle East Regions post-oil era. Discussing the consequences of rapid urbanization and ongoing developments, which have led to a general loss of identity in the Gulf regions, there is a robust ongoing dispute that confronts the desire to build new contemporary cities and the instinctive social need to preserve and re-qualify historical heritage as a precious tool for establishing new relationships with local history and culture. The paper describes, classifies, and compares some exemplary projects for preserving historical heritage in the Gulf countries, with particular attention to the Saudi Arabia heritage. The interventions were analyzed and compared, considering the sustainable aspects linked to the local heritage’s environmental, socio-economic, and socio-cultural principles. As a cultural, social, and environmental value, sustainability is one of the most distinctive principles that should be applied to the entire heritage restoration and conservation process, promoting its enhancement, especially in the post-oil era. The results highlight many links between the conservation of ancient natural materials of the historical heritage, the promotion of cultural and social values, the adaptation techniques to the climate, the synergy with the existing historic buildings environment, enhancing the high level of sustainability and environmental respect for local culture and traditional construction techniques.

KEYWORDS
National heritage, conservation, heritage safeguard, cultural values, national identity

1. Introduction: the heritage safeguard in the Gulf Countries
In the arid environment of the Arabian Peninsula, the area economy has been entirely transformed by the recent oil discovery. The country changed from a traditional tribal neighborhood into an international economic hub after 1938 when the oil production started, and some oil fields located in the eastern province of Saudi Arabia and Bahrain were initially discovered. Suddenly the fast urban growth of the Gulf regions changed the local tradition and economy. In 1981 the Gulf Cooperation Council (GCC) was initiated to defend the common local interests [1], based on oil production and exportation. In 1950 six cities emerged for the rapid transformation of their economy; Kuwait City in the northern reached more than two million inhabitants; Dubai, and Abu Dhabi, in the United Arab Emirates became two cosmopolitan hubs together with Muscat in Oman. In the western area of Riyadh, the Saudi Arabia capital started to change rapidly. The fast growth produced many urban challenges and new economic strategies that affected the traditional urban settlements. In many city centers, the massive construction of modern concrete-and-steel structures from the 1950s has barely impacted the traditional urban growth of the areas. Massive demolitions have changed the old city centers to make space for the contemporary towers. The Gulf regions have been affected by the loss of many important historical traditions due to the lack of national safeguarding laws to preserve the heritage. However, recently the local governments improved the restrictions and regulations to
safeguard many architectural artifacts and many neglected urban areas abandoned after the oil
discovery. Many historic buildings have recently been restored and reused by integrating the old uses
with the new contemporary social needs to preserve and rehabilitate traditional roots.
The heritage safeguard and reuse for the requalification of the cultural values have been subjected to a
renewed interest in the last decade, especially in terms of rediscovery and promotion of local traditions
that should be transferred to future generations by adopting a more sustainable approach. The aim is to
promote the restoration and reuse of historic buildings by enhancing the commercial values of the
areas as new tourist attractions to enhance the local economy and social-cultural values.
The United Nations Educational, Scientific, and Cultural Organization have promoted the principles of
safeguard, sustainability, and sustainable reuse of heritage, although nowadays, the definition of
sustainability is broadly debated. Sustainability is any intervention’s capability to respect and improve
the environmental circumstances by using available resources to meet local needs and requirements.
The World Heritage definition of adaptive reuse is linked to the quality principles of increasing the life
cycle of any historic building and leading to significant social, cultural, environmental, and economic
results [2].

2. Assessing sustainable heritage reuse
The paper presents a research approach to analyze and assess the sustainable reuses of recently
completed or under-completion conservation projects in the Gulf Countries. The study aims to identify
and adopt some sustainable principles for assessing heritage reuses, considered for the project's
realization. The intent is to demonstrate how architectural heritage preservation, through sustainable
reuse, can raise the interest of local values and enhance the local identity of places.
The research introduces and presents some selected case studies of heritage reuse to describe the
traditional materials and the conservative techniques adopted during the restorative interventions,
capable of providing principles and guidelines for future projects. The reuse of heritage buildings and
the preservation of original structures usually involve many values: social, economic, cultural, and
resource enhancement. Together with the projects' sustainability, many of these factors and values
have recently been promoted by the UN General Assembly [3] to enhance the value of heritage
restoration and the country's growth. For evaluating the heritage reuses interventions, we have selected
three main criteria for assessment: socio-cultural, environmental, and socio-economic.
Historical heritage reuse does not only involve preserving old materials and neglected structures or
abandoned urban sites. It also considers the spread of local culture, history, the memory of
knowledge, and traditions to be preserved and transferred to future generations.
The case studies have been selected in the literature review by considering the oldest structures and
sites that date back from old times and recently discovered and studied Gulf regions. Table 1 shows
the recently discovered ancient sites in the region dating back to the 17th century that have been
interested in recent studies under the supervision of governmental offices in Qatar, in the Emirates,
and Saudi Arabia (Table 1).

| Site      | Location     | Dating (approx) | References          |
|-----------|--------------|-----------------|---------------------|
| Al-Zubarah| Qatar        | 11th century    | Walmsley et alii, 2010 [4] |
| Doha      | Qatar        | 18th-19th centuries | Fletcher, Carter, 2017 [5] |
| Kuwait    | Kuwait, Emirates | 17th-19th centuries | Di Miceli, 2020 [6] |
| Al Khari  | KSA          | 15th-18th c     | Schietecatte et alii, 2013 [7] |

3. Methodology: sustainable assessment’s criteria and principles
The assessment of the selected cases study and the sustainable reuse interventions in the Gulf regions
have considered three main criteria:

- Socio-cultural criterion for enhancing the cultural diversity, social inclusion, social
  attachment, the discovery of community belonging, and the valorization of cultural values;
• Environmental criterion that enhances the environmental qualities of the sites by minimizing the climatic changes and negative aspects;
• Socio-economic criterion that promotes the social values of a place and emphasizes the country's economic growth.

Some principles for assessments selected from the literature review have been adopted for the comparisons and analyses (Table 2).

Table 2- Sustainable principles for assessment adopted for the research

| SOCIO-ECONOMIC SUSTAINABILITY | 1. To support local autonomy |
|-------------------------------|-----------------------------|
|                               | 2. To promote traditional activities |
|                               | 3. To optimize construction efforts |
|                               | 4. To extend building lifetime |
|                               | 5. To save resources |
| SOCIO-CULTURAL SUSTAINABILITY | 6. To protect the cultural landscape |
|                               | 7. To transfer construction cultures |
|                               | 8. To enhance innovative and creative solutions |
|                               | 9. To promote tangible and intangible values |
|                               | 10. To encourage social cohesion |
|                               | 11. To improve the quality of laborers' working conditions |
| ENVIRONMENTAL SUSTAINABILITY  | 11. To respect environmental context and landscape |
|                               | 12. For the benefit of natural and climatic resources |
|                               | 13. To reduce pollution and materials' waste |
|                               | 14. To contribute to human welfare and health |
|                               | 15. To reduce natural hazard effects |

The research has mainly considered three categories of adaptive reuse interventions, together with diverse typologies of interventions:
• Adaptive reuse of architectural examples considering the high number of historic defensive structures (towers, forts, and defensive walls). The restorative intervention intended to strengthen the local history and traditions;
• Adaptive reuse of urban residential and commercial areas located in the old city centers to enhance the local culture;
• Adaptive reuse of archaeological sites to enhance the national territory and the local tourism.

4. Sustainable reuse of architectural buildings: defensive structures to discover the history

In recent decades, the governmental institutions responsible for safeguarding the heritage in the Gulf Regions have favored and financed the completion of many heritage reuse projects to save and rehabilitate many architectural buildings seriously damaged after a long period of abandonment. The research has compared the adaptive reuse interventions of three ancient historical defensive structures, the Al Jahili Fort located in the United Arab Emirates, in Al Ain, the Al Zubarah fort in Qatar, and the Al Masmak Fort in Saudi Arabia. The defensive function was to protect the inhabitants from foreign attacks and look after the rare drinking water wells. After the interventions, the forts have been brought into new life by enhancing local history's value and knowledge.

4.1. Al Jahili Fort, Emirates

Al Jahili Fort in the United Arab Emirates (Al Ain) is a traditional fort constructed in 1891 by Sheikh Zayed, the First to defend the palm groves and the land. It has also been used lately as a residence. In 2007 the fort was consolidated entirely and restored by the Abu Dhabi Tourism & Culture Authority, and it is now used as an exhibition center to showcase important explorative discoveries of the area.
The round defensive towers located at the corners of the squared fort were consolidated entirely to ensure the entire structural stability. The defensive walls, constructed of local materials such as coral and limestone, masonry, and mud bricks, have been preserved and protected. The competed reuse project attracts many visitors every year to explore the landscaped gardens and the exhibition center.

4.2. Al Zubarah Fort, Doha Qatar

Close to archaeological remains of Al Zubarah area, on the western coast of Qatar, is a historic fortress of Al Zubarah (Figure 1) built in 1938 by Sheikh Abdullah bin Jassim Al Thani as a defensive military structure, used as a coastguard station. The fort was part of a defensive system done by towers for surveillance located around the territory, on the main roads to defend the city centers. Compared to the adjacent Al Zubarah archaeological site, the fort is relatively recent, where an old commercial coastal town flourished due to pearling trade. The archeological site was included in the UNESCO list in 2013 due to the importance of the archaeological findings. The fortress was in use till the 1980s, then was abandoned and neglected, and the structures have deteriorated. However, all the original materials were consolidated and ultimately reinstated by adopting local materials during the restorative works in 2015 by the Governmental Institution of Qatar Museums Authority (QMA).

The squared fort with four defensive towers on the corners was built with local limestone blocks. The internal partitions were consolidated to enhance the structural stability. All the old materials, mud plasters, ceiling timber poles, deteriorated because of the weather conditions, have been restated to solve many foundational damages. The restored fort is today reused as a museum: it exhibits the archeological finds from the Al Zubarah archaeological site and is part of the national touristic tour of Qatar. The intervention has adopted sustainable use of traditional materials and techniques, adapting the new sustainable reuse of old spaces by enhancing the socio-cultural value of the site, where to discover the local traditions of military culture, the drinking water supply techniques adopted in the past years through the wells. The rediscovery of Qatari defensive traditions has enhanced the socio-economic aspects of neglected places for many years. Today the restored structures showcase the local traditions over the past centuries. The restorative intervention included updated systems to afford the environmental characteristics of the site [8][9].

4.3. Al Masmak Fort, Riyadh, Saudi Arabia

Al-Masmak Fortress is located in the heart of Riyadh city, and its history dates back to the beginning of the XX century when 1902 was used as a defensive structure during the unification of the Kingdom of Saudi Arabia. Lately, the fort was converted into a warehouse and then turned into a prison. Only recently, it has been converted into a heritage landmark in the heart of Riyadh. Today, the fort is used as a museum subdivided into six main parts: the fort, the mosque, the majlis area, the old well on the northeastern side, the courtyard with the surrounding rooms, and the defensive structures surrounded by the towers in each of its four corners. Al Masmak fort museum also exhibits three Residential units, the ruler’s residence, the treasury, and the guesthouse. The citadel of Al Masmak was entirely built with mud bricks, traditional construction techniques, and sustainable materials. The roofs are covered with palm trees, leaves, and wooden poles. The renovation project started in the 1980s adopted the traditional use of old techniques and materials that are currently protected by a layer of waterproofing plaster to preserve the authenticity of the materials and avoid any deterioration due to the weather.
conditions. The fort became a museum in 1995 and, starting from 2011, was renovated by adding new exhibition areas to display ancient maps and photographs of Saudi Arabia dating from 1912 to 1937, and a range of historical artifacts, works of art, audiovisual presentations. The rehabilitation supervised by the Saudi Commission for Tourism and National Heritage (SCTH) has also included a smartphone application for “Virtual Tour via 3D images, telling the story of the Kingdom’s birth. The restored fortress is a favorite heritage landmark among tourists that desire to explore Saudi Arabia’s roots under the patronage of King Abdul Aziz Historical Center (KAAHC) (Figure 2).

Figure 2. Al Masmak Fort, the restoration works recently completed and the reuse as a museum of the fort (Source: https://heritage.moc.gov.sa/en/points-of-interest/al-masmak)

5. Sustainable urban regeneration: enhancement of local tradition, commercial activities, and tourism
Many Gulf countries’ interventions have recently involved the massive urban regeneration of many areas located in old city centers or seashore areas after being abandoned and neglected for many years. Current needs and more technological tools have replaced the traditional functions. The abandoned areas during the past decades have been subject to a partial loss of parts. Nevertheless, the sustainable reuse, thanks to the conservative interventions, have bought to a new life and new uses the old heritage buildings. The assessed projects of Al Fahidi quarter in Dubai (United Arab Emirates), the Ushayger Heritage Village in Saudi Arabia, and the Souq Waqif in Doha (Qatar), [10] recently completed have enhanced the values of local traditions and the promotion of tourism and new commercial activities through sustainable reuse of heritage.

5.1. Al Fahidi Historical site at Bastakiya quarter, Dubai, Emirates
Al Fahidi Historical site in the Al Bastakiya neighborhood in Dubai United Arab Emirates restoration projects [1] was completed by the Dubai Municipality 2003 in the United Arab Emirates (UAE) in 2003. The site was owned during the 19th century by Persian merchants. Classified as a heritage site after many years of abandonment, it was restored and reused only recently. The structures underwent massive structural consolidations to reduce the risk of loss and collapse after many years of abandonment. The intervention partially transformed the original settlement, but the principle of preservation was mainly adopted to maintain the current status of the places; consequently, the intervention partially transformed the original urban fabric of the place. The al Bastakiya complex currently presents good preservation of typological elements such as doors, staircases, windows, timber poles to respect the local tradition and style. The site is open to tourists as a historical museum is always open to the public.

5.2. Ushayger Heritage Village in Saudi Arabia
The urban regeneration of Ushayger Heritage Village (Figure 3) targets an area in Saudi Arabia located in the heart of the Najd region northwest of Riyadh, the Saudi Capital. The village was restored many years ago by the owners of the Ushayger district by revitalizing the properties. After the completion of the central facility systems (parking, accessibility, urban light system, editable water
supply), upgraded under the supervision of the Saudi Commission for Tourism and National Heritage (SCTH), the heritage village is reused as a residential area that attracts every year many locals and visitors to discover the local values of the site. The heritage village was used 1,500 years ago by bedouins and pilgrims on their way to Makkah for the springs and palm groves. The heritage houses were restored using the traditional adobe construction techniques of mud bricks, plasters, wooden decorated doors, and windows. Narrow lanes characterize the pedestrian accessibility and circulation to exhibit the old uses of residential places. A small community of owners still inhabits the village that presents a primary school, many shops, and a mosque. The restoration project brings to life the Najdi architecture with the distinctive triangular windows and the richly engraved wooden doors that still exhibit the name of families living there, bringing back an example of sustainable reuse that enhances the local traditions and social values of ancient times. The sustainable residential reuse of traditional villages shows how heritage preservation helps enhance the traditional culture of the places by enhancing the transmission of socio-cultural aspects to future generations. The new functions (tourism, entertainment) demonstrate the heritage ability to adapt to the new contemporary social needs.

5.3. Souq Waqif in Doha, Qatar
The urban rehabilitation of Souq Waqif in Doha, Qatar, was completed in July 2006 under the supervision of PEO (Private Engineering Office). The sustainable rehabilitative urban approach integrated the local tradition by promoting cultural values. Souq Waqif is an extensive urban development, which combines traditional commercial activities with the contemporary need for entrainment places close to Doha’s city center. The restoration project has been based on analyses on the old Souq urban fabric to preserve most of the survived buildings, although they were seriously damaged after many years of neglect and abandonment. The reconstruction works included the oldest structures conservation and recovering the local building typology by adopting the traditional constructive methodology [9] [10]. The restored Souq Waqif (Figure 4) is currently the most vital city center commercial area and offers an architectural solution for integrating the traditional spaces and the contemporary needs of the people. The site provides a comfortable and pleasing atmosphere that attracts many local inhabitants and tourists during the year that appreciate the site’s heritage values.

Figure 3. Ushayger Heritage village, residential reuse in Saudi Arabia. (Source: Author)

Figure 4. Souq Waqif, sustainable reuse of commercial places in Doha (Source: Author)

The described urban regeneration projects show the sustainable reuse of important historical centers and how preserving the heritage helps to enhance the traditional culture of the places.
After the interventions, both the sites are reused as cultural centers in the area. The reuses have permitted the improved values of the local tradition by enhancing the transmission of cultural tradition linked to the performance of residential spaces and functions. One of the most critical aspects adopted for the restoration interventions was to emphasize and improve the transmission of socio-cultural aspects, which in most cases are not considered. The new function of the city center has highlighted the ability of the old buildings to adapt to the population's needs. It has become an example of social values strengthening, thanks to recognizing social cohesion in the territory.

6. Archaeological reuse interventions: new touristic places

Many Gulf countries are currently searching for the rehabilitation and requalification of numerous heritage archaeological sites to improve the social and cultural values of the places by sharing the historical tradition and raising awareness about the archaeological values of the places. Many areas are currently undergoing systematic archaeological campaigns to discover the ancient origins and improve the economic values of places that are currently abandoned and neglected by enhancing the touristic offer to visitors. The difficult reachability of the old sites has prevented them from damages and loss so that they are still inviolate by tourists.

6.1. Al Zubarah archeological site, Qatar

The Al Zubarah archaeological site is located on the north coast of Qatar. A campaign of archaeological excavations was completed in 2014 under the Qatar Museums Authority and Qatar Islamic Archaeology and Heritage Project (QIAH), the entities of the national committee for the protection of the archaeological site. Al Zubarah in 2013 was listed on UNESCO heritage sites. Al Zubarah was a fortified commercial city that developed around the 11th century AD in the medieval Islamic period. The city was destroyed in 1811, and it was finally abandoned at the beginning of the 20th century. From the archaeological excavations, it was discovered that the urban fabric of Al Zubarah consisted of courtyard houses built from local stone and limestone extracted at the northern settlement of Freiha, with a thick protective outer coat of mud plaster. Al Zubarah presents the historic urban and spatial organization of the old city and the history of the local society and its economy, as they existed before the discovery of petroleum and the advent of the oil and gas age in the 20th century. The archaeological site is now a large outdoor urban archaeological museum with facilities and services for tourists and visitors.

6.2. Diriyah archeological site in Saudi Arabia

The Turaif Quarter in Al-Diriyah is located on the west side of Riyadh, the capital of Saudi Arabia. The ancient urban settlement is located in the valley of Wadi Hanifa, which provided water to the place for the survival of the inhabitants during the hot season. The site was included in the UNESCO world heritage list in 2010 being the primitive capital of the Saudi royal family that dated back to 1744 and lasted till 1818 when the area was occupied during the Ottoman-Saudi war. The urban settlement was founded in the 15th century and expanded till the 16th century. In the early 19th century, the site grew as the Saudi capital under the power of the House of Saud. The royal palace was later fortified to resist the foreign attacks, and during the following centuries, became the fortified center of at-Turaif, with Salwa palaces located into the citadel. The restoration project has brought an actual example of a complex urban development to a new life throughout the past centuries. The site provides a complete account of Najdi town planning from the mid-18th century until the 19th C. The urban settlement is entirely constructed with adobe materials with using wattle and mud made by using straw and palm leaves, that after being dried, is very resistant to the weather condition adapt to extremely severe weather conditions. The urban regeneration project started in 2009, the site underwent a renovation program to revitalize the area under the supervision of Diriyah Gate Development Authority (DGDA) that was founded in 2017 to lead several additional conservation projects. Al-Turaif area has been transformed into an open museum heritage site to enhance the social values of places and discover the local identity and cultural tradition. The most interesting places are Al Bujairi, a pedestrian area with cafes and craft shops, and many cultural sites include the Diriyah Museum, the former palace that exhibits the local Saudi history, and the restored Al-Zawihra Mosque. Between the restored buildings,
the At-Turaif Bath House still testimony the use of bath space in ancient times. The sustainable reuse of the archaeological sites' projects has highlighted the valorization of the socio-cultural and socio-economic conditions of the rediscovered areas. Regarding the socio-cultural values, all the projects have improved the local inhabitants' and visitors' sense of attachment to the local tradition of archeological sites by producing new touristic entertainments and strengthening the local history's values. Furthermore, from a socio-economic point of view, both the reuse projects have improved the values of old areas after being abandoned for many years.

7. Results: the comparison of sustainable reuse interventions

The research demonstrates the results of sustainable principles adopted for assessing the sustainable reuse interventions in the Gulf Regions considered into the categories: architectural, urban, and archeological. Table 3 proposes a summary describing the selected restoration projects in the gulf regions and their main characteristics. Specifically, some intervention typologies have been considered (defensive structures, ancient residential settlements, and commercial areas), combined with the project characteristics (architectural, urban and archeological). Table 4 presents the result of the assessed restoration projects based on the adopted sustainable socio-economic, socio-cultural, and environmental criteria and the adopted principles of sustainability.

| Name                  | Date/Site  | Institution                          | Old use | Project categories         | Adaptive Reuse      | Sustainable principles            |
|-----------------------|------------|--------------------------------------|---------|---------------------------|---------------------|-----------------------------------|
| Al Jahili Fort         | 2007 Al-Ain Emirates | Abu Dhabi Tourism & Culture Authority | Defensive | Architectural conservation | Fort Museum            | Socio-cultural Environmental      |
| Al Zubarah Fort        | 2014 Doha Qatar        | Qatar Museum Authority                | Defensive | Architectural conservation | Fort Museum            | Socio-cultural and socio-economic |
| Al Masmak Fort         | 2011 Riyadh, Saudi Arabia | Saudi Commission for Tourism and National Heritage | Defensive and Residential | Architectural conservation | Fort museum            | Socio-cultural socio-economic      |
| Al Fahidi Al Bastakiya | 2003 Dubai Emirates    | Dubai Municipality                    | Residential | Architectural regeneration | Commercial Museum | Socio-cultural socio-economic      |
| Ushayger Village       | Saudi Arabia | Residential                           | Residential | Urban regeneration         | Residential Commercial Museum | Socio-cultural socio-economic environmental |
| Souq Waqif             | 2006 Doha Qatar        | Private Engineering Office PEO        | Old Souq commercial | Urban regeneration         | Commercial Entertainment | Socio-cultural socio-economic environmental |
| Al Zubarah Archaeology  | 2014 Qatar | Qatar Museum Authority                | Residential | Archaeological conservation | Open-air museum       | Socio-cultural socio-economic      |
| At-Turaif District     | 2009 Saudi Arabia      | Diriyah Gate Development Authority DGDA | Residential | Archaeological conservation | Open-air museum       | Socio-cultural socio-economic      |

| Table 4- Results of the small area survey, conducted involving various participants. |
|---------------------------------|---------------------------------|---------------------------------|-------------------|
| Areas of sustainability    | Principles of sustainability | A= High | B= Average | C= Low | Architectural restoration | Urban regeneration | Archaeology conservation |
| Socio-Economic               |                                | Al Jahili Fort | Al Zubarah Fort | Masmak Fort | Al Bastakiya | Ushayger | Souq Waqif | Al Zubarah | At-Turaif |
| 1. To support local autonomy |                                | A | B | A | A | B | A | C | A |
| 2. To promote traditional activities |                                | A | B | A | B | A | C | A |
| 3. To optimize construction efforts |                                | A | A | A | A | A | A | B |
The assessed adaptive reuse projects showed that all the projects had followed the restoration approach imposed by the government authorities responsible for the interventions. The comparison principles also have considered the category of interventions, environmental aspects, the surroundings and the context of the historic building, the links with the traditions, the transmission of cultural and social values, the new buildings' functions, and the results of the reused places. All the assessed interventions of adaptive reuse have highlighted the enhancement of the socio-cultural and socio-economic conditions of the restored buildings and urban areas. Regarding the socio-cultural values, many interventions have strengthened the sense of belonging to the local traditional places by producing new entertainment and commercial areas (souqs) and by strengthening the values of local historical places (residential settlements and fortified structures). Furthermore, from a socio-economic point of view, the reuse of heritage buildings and places has contributed to re-establishing the site’s value after being abandoned for many long years. The results help to understand how the restoration of local heritage can enhance the social-cultural, socio-economic, and environmental criteria.

8. Conclusions: sustainable reuse to enhance the heritage in the Gulf Countries

The research has highlighted a growing use of increasingly sustainable and effective methodologies in conservation and reuse interventions, showing how the need to recover local architecture is directly linked to awareness of Gulf territories' cultural identity that should be strengthened. The concept of sustainability is therefore addressed through its complex meaning of unity and harmony capable of combining ancient materials, construction techniques, the old use of historic buildings, systems of adaptation to the environment, respect for ecosystem, the national cultural and social aspects, economic investments, also thanks to the comparison of examples chosen on different categories of intervention: urban, architectural and archaeological categories. The goal is to define a persistent approach and enhance the Arab restoration tradition in compliance with the principles of sustainability, environment, and enhancements of the local practice.

9. References

[1] Salama A 2012 Architectural Identity Demystified: Visual Voice from the Arab World The Cultural Role of Architecture: Contemporary and Historical Perspectives, Paul Emmons, Jane Lomholt, and John Shannon Hendrix, (eds) (London: Routledge) 175-85.
[2] UNESCO-ICOMOS, 2010 Management Plans and the World Heritage Convention – A Bibliography, ICOMOS (Paris: International Council on Monuments and Sites)
[3] UN General Assembly 2015 The 2030 Agenda for Sustainable Development, (New York: United Nations).
[4] Walmsley A Barnes H Macumber P 2010 Al-Zubārah and Its Hinterland, North Qatar: Excavations and Survey, Spring 2009 Proceedings of the Seminar for Arabian Studies, vol. 40, Janet Starkey(ed) (Oxford: Archaeopress) pp 55-68.
[5] Fletcher R and Carter R 2017 Mapping the Growth of an Arabian Gulf Town: The Case of Doha, Qatar, Journal of the Economic and Social History of the Orient, 60(4) pp 420-487
[6] Di Miceli A 2020 Overview of the early Islamic site discovered by the Kuwaiti-Italian Archaeological Mission of al-Qurainiyah, *Le carnet de la MAFKF. Recherches archéologiques franco-koweïtiennes de l’île de Failaka* (Koweït)

[7] Schiettecatte J Al-Ghazzi A Crassard G.C.R Hilbert Y Monchot H Mouton M Simeon P 2013 The oasis of al-Kharj through time: first results of archaeological fieldwork in the province of Riyadh (Saudi Arabia), *Proceedings of the Seminar for Arabian Studies* Volume 43 (Oxford Archacopress)

[8] Mazzetto S Petruccioli A 2018 Methods and Techniques Used in Significant Restoration Projects in Qatar *Studies in Conservation*, vol. 63, issue 5, pp. 303-314.

[9] Mazzetto S 2018 Evaluation of the Impact of Sustainability Principles on Adaptive Reuse Interventions: The Case of Qatari Heritage Experience *Architecture Research*, vol. 8, issue 4, pp. 129-137

[10] Mazzetto S 2018 Heritage restoration as a tool to promote the cultural identity in the Gulf Regions in *Preservation, Digital Technology & Culture*, vol. 47, issue 1, pp. 3-11.

Acknowledgments
The author would like to thank Prince Sultan University for its economic support and providing an environment that motivates collaboration and research.