College of Humanities, Arts and Social Sciences

Department of Archaeology

Farasan Islands: From Obscurity to Recognition

Discovering the Conservation Hazards of Cultural Heritage Buildings

By Abdullah Ahmed A Refaei

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A thesis submitted in partial fulfillment of the requirements for the degree of Master of Archaeology and Heritage Management.

Declaration

I certify that this work does not contain any material previously applied for a degree or diploma at any institution without acknowledgement and that it does not contain any material previously published or written by another author, except where proper references have been made in the document.

Name: Abdullah Ahmed A Refaei

Email: refa0003@flinders.edu.au

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Abstract

Management is an essential aspect of the conservation of heritage sites and the surrounding environment and meeting the needs of locals. Managing a country's heritage sites begins with fully comprehending their importance, followed by the planning and implementation of strategies with the involvement of a range of stakeholders. Saudi Arabia's government generally take charge of guiding and managing cultural heritage conservation processes.

This research aims to review the various strategies used by countries worldwide to manage their cultural heritage and evaluate whether these methods could be implemented in the Farasan Islands in Saudi Arabia. Implementing these strategies and standards applied around the world and taking another approach in the appropriate ways that should be applied to the buildings in Farasan Islands. This thesis also considers appropriate strategies for the conservation, restoration, maintenance, and management of various sites in the Farasan Islands. It explores ways in which the Saudi *Vision 2030* goal to boost tourism may be met by paying attention to historical buildings in the Farasan Islands. The Farasan Islands are distinguished by the importance of their location near the international shipping lane, as well as its proximity to Bab al-Mandab and African countries, and its richness in natural, tourist, and archaeological resources, its coral people, and fish wealth, which made it a destination for tourists, businessmen and fishermen alike.

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List of Abbreviations

ICCROM	International Centre for the Study of the Preservation and Restoration of Cultural Property
ICOMOS	International Council on Monuments and Sites
KSA	Kingdom of Saudi Arabia
MAB	Man and the Biosphere Programme
PICTURE	Proactive Management of the Impact of Cultural Tourism upon Urban Resources and Economies
SCTH	Saudi Commission for Tourism and National Heritage
SHPS	Saudi Heritage Preservation Society
SWA	Saudi Wildlife Authority
UAE	United Arab Emirates
UNESCO	United Nations Education, Scientific and Cultural Organisation

Chapter 1: Introduction

This project focuses on the conservation and management of historic buildings that have cultural and aesthetic value for tourists travelling to the Farasan Islands in the Kingdom of Saudi Arabia (KSA). Specifically, it investigates how methods applied to the conservation of historical and cultural heritage sites globally may be applied to those in the Farasan Islands. The Farasan Islands have become a popular tourist destination, not only for their rugged, unspoiled coastline and biodiversity but also for their buildings, which have historical and cultural significance for the islanders. These historic buildings attract many tourists, contributing significantly to the local economy and providing job opportunities for island residents. Therefore, it is important to examine in detail the risks to these historic buildings, including the factors causing their deterioration, and consider appropriate conservation and restoration strategies that may be adopted by the Saudi government.

Vision 2030 is an important Saudi policy aimed at reducing the country's economic reliance on oil (Vision 2030, 2021:6). This will partly be achieved by boosting the tourist sector through promoting the nation's cultural heritage. Success stories always begin with a vision, and the most successful visions are those that build on existing strengths. *Vision 2030* expresses the aspirations of Saudi society and reflects the capabilities of the kingdom.

The research question for this study is: **How can current heritage conservation and management strategies in the Farasan Islands align with Saudi Arabia's *Vision 2030*?**

1.1 Research Aims

- This thesis presents the history of the Farasan Islands, reviews existing conservation techniques, examines the cultural heritage and conservation of buildings in the Farasan Islands and discusses the potential success of *Vision 2030*. These techniques can help to address the best measures that Saudi Arabia's government can take.

- The research is aimed at drawing the attention of the Saudi Commission for Tourism and National Heritage (SCTH) and the Ministry of Culture by outlining essential strategies to restore and preserve these buildings, protect them from graffiti, improve security and sustainably develop the heritage sites. Therefore, that can save the rest of

the cultural heritage buildings in the Farasan Islands. This thesis also outlines the essential management practices to enhance these structures.

1.2 Significance of the Research

Historic buildings on the Farasan Islands are at risk. Government interventions are urgently needed to prevent the further loss of valuable historical buildings and cultural heritage. The rationale behind *Vision 2030* is to diversify the nation's sources of income and promote tourism, partly through the maintenance and conservation of historical buildings. This thesis sheds light on issues that may assist in achieving this vision. The overall aim of this study is to determine the benefits of conserving Farasan Island heritage sites for the local and international community. Given that KSA will become completely dependent on tourism over the next 10 years, this study will help it meet the goals of *Vision 2030*. Therefore, this research has five main objectives: (i) to generate a new understanding of conservation issues; (ii) to assess the cultural heritage of the Farasan Islands; (iii) to evaluate the role of conservation in achieving *Vision 2030*; (iv) to explore emergent techniques and models of conservation; and (v) to showcase existing cultural heritage sites with the purpose of safeguarding them.

1.3 Research Limitations

The study is limited in terms of its assessment of strategies that may be used in the conservation and management of heritage on the Farasan Islands. Prior to the COVID-19 outbreak, the researcher travelled to the Farasan Islands to undertake a feasibility assessment; however, the COVID-19 lockdowns meant that the planned field trip to assess heritage buildings on the islands could not proceed. Therefore, the thesis reviews existing conservation strategies and assesses these against the limited site inspections, and conclusions are based on previously reported threats and those observed during the reconnaissance trip. Thus, the assessment of the effectiveness of strategies used to conserve and manage heritage sites is limited. Due to the restrictions of the Covid-19 pandemic, the researcher quickly examined historical buildings to avoid closing the Australian borders.

1.4 The Farasan Islands

Located in the Red Sea, the Farasan archipelago is made up of 84 coral islands lying approximately 50 km off the coast of Jazan in south-western Saudi Arabia near the border of Yemen (Cooper and Zazzaro 2014:153). The largest island in the archipelago is Farasan Island (Cooper and Zazzaro 2014:168) (see Figure 1). Three of the islands—Qumah, Sajid and Greater Farasan—are inhabited (Hausmann and Meredith-Williams 2017:368). Other islands were previously inhabited by pearl divers and fishers; but they are now protected nature reserves for many bird species, Arabian gazelles, and marine life (Bailey et al. 2012:54).

Figure 1: Map of the Farasan show the main Islands and the surrounding areas (Aguis et al. 2016:130).

The region has a tropical climate, with a high average temperatures, high humidity, and low annual rainfall (Khushal 1997:14), most of which takes place between December and April, with a maximum of 22 mm in February (Hausmann and Meredith-Williams 2017:363). Despite their lack of vegetation and greenery, the islands are known for their epic scenery (Hausmann

et al. 2019). The islands are formed from uplifted fossil coral reef, deposits of alluvial and aeolian soils and low-lying *wadis* (Bailey et al. 2012:36). Their sources of underground water are thought to have been the main attraction for seafarers and settlers in the past. The Farasan Islands still serve as a paradise for divers, although conservation practices preclude diving off certain islands (Bailey et al. 2012:72).

The cultural heritage of the Farasan Islands includes monuments, buildings, and other sites of historical, aesthetic, archaeological and scientific value (Ayachi and Jaouadi 2017:235). Surveys and excavation activities have been essential for protecting and conserving historical sites (Hausmann and Meredith-Williams 2017:371). The Farasan Islands are distinguished by the historical presence of many civilisations; therefore, each site has a unique value (Al-Tohhais and Thapa 2020:8). Figures 2 and 3 show some of the historic houses in the Farasan Islands (Al-Suliman 2020:86).

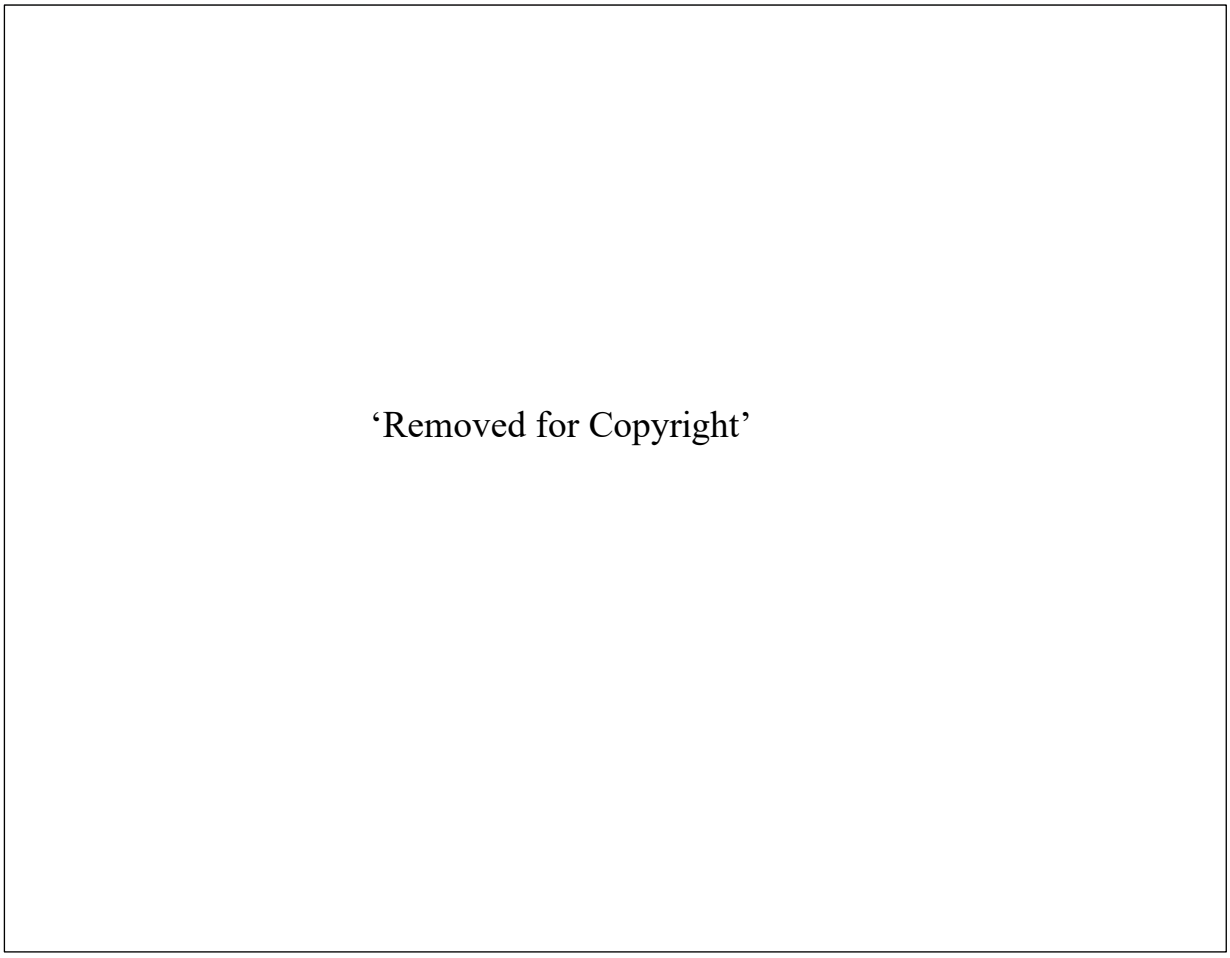

Figure 2: Hussein Al-Rifai house, showing structures and architectural inscriptions (Al-Suleiman 2020:87).

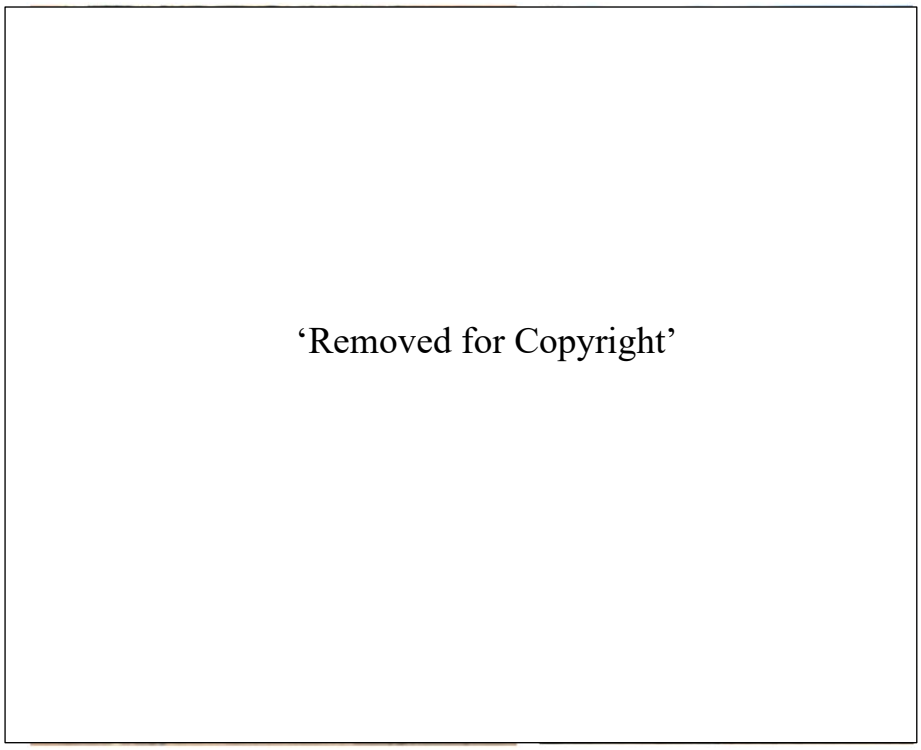

Figure 3: Locations of some houses on Farasan Island: (a) Qasr Al-Najdi, (b) house of Ahmed Al-Rifai and (c) house of Hussein Al-Rifai (Al-Suleiman 2020:88).

The Farasan Islands comprises both large and small islands. The largest island is situated in the centre of the islands and is home to Hussein house, Luqman Castle, Gharrain, Al-Qassar Heritage Village, and Sayr Village. The German house is located on Qumah, which is about 23 km from the main island. Sajid is also home to heritage and archaeological structures.

1.5 Early Human Occupation to the Twentieth Century

The Farasan Islands went largely unnoticed until the first and second centuries AD (Hausmann and Meredith-Williams 2017:367). The islands were occupied during the Holocene, as evidenced by the existence of shell middens, which have been dated to 5,000–5,500 years ago (Hausmann et al. 2019). Archaeological researchers have traced the original peoples inhabiting the islands from early inscriptions (Hausmann and Meredith-Williams 2017:369). Human occupation increased after AD 144, as evidenced by Latin historical inscriptions (Cooper and Zazzaro 2014:158) (Hausmann and Meredith-Williams 2017:378). Human activity began with the early Romans expanding their territory beyond the Red Sea. The Romans dominated the Saudi Arabian region, including the Farasan Islands. Analysis of archaeological sites on the

islands shows that the Roman Empire played a crucial role in Red Sea maritime commerce and naval activities. Inscriptions indicate that in the early years of the Roman Empire, the islands were home to a detachment from the Second Legion Traiana Fortis (Hausmann and Meredith-Williams 2017:374). Research also shows that maritime activities occurred on the islands between the Eritreans (appointed to support the Christian fleet exploration) and the Jewish Himyarites in AD 525 (Cooper and Zazzaro 2014:163). The islands' early occupants also included Christians, who are reported to have been present by the tenth century AD and who constructed Christian churches (Hausmann et al. 2019). The *Martyrdom of St. Arethas*, published in the late seventh century AD, mentions that maritime vessels based in the Farasan Islands were sent to Adulis on the coast of Eritrea (Zazzaro and Cooper 2014:17). The ships joined the Christian Abyssinian fleet in a mission against the Jewish Himyarite king Dhu Nuwas in AD 525 (Hausmann and Meredith-Williams 2017:370). During this period, the island's inhabitants were thought to have been mostly Christian, as reported by the tenth century AD historian Hamdani, who also reported seeing ruined Christian churches on the island (Cooper and Zazzaro 2014:153). The islands are of paramount significance to the southern Red Sea area because of the existence of a creek known as Ar Khawr, which could hold up to 1,000 ships in the autumn months, when there is plenty of water and food in the Red Sea (Cooper and Zazzaro 2014:153).

The main phase of occupation began with transatlantic trade in the fourteenth century (Hausmann and Meredith-Williams, 2017:372). The islands' strategic significance grew until the Egyptian Mamluks briefly invaded in the early sixteenth century (Cooper and Zazzaro, 2014:157). This was followed by the Ottoman occupation at the beginning of the twentieth century, which authorised the establishment of a coaling station on Quman (Cooper and Zazzaro 2014:170). The remains of this station show that the British briefly occupied the island during the First World War. The islands were subsequently incorporated into Saudi Arabia in the early 1920s (Cooper and Zazzaro 2014:151). Their absorption contributed to an economic crisis in the pearling industry during the 1930s and 1940s (Cooper and Zazzaro 2014:169). Pearling resumed in later decades with the growth of the Saudi oil industry (Cooper and Zazzaro 2014:172). Although it is not evident when pearling commenced on the island, a recent analysis of two Latin inscriptions identified in Egypt's Eastern Desert indicates that pearl diving existed in some regions of the Red Sea during the Roman Empire (Bailey et al. 2019:601). The more recent boom in pearling during the eighteenth and nineteenth centuries created a legacy of cultural groups and architecture (Hausmann and Meredith-Williams 2017:374). Historical data

indicate that there was maximum settlement in the Farasan from the sixteenth to the twentieth centuries (Hausmann and Meredith-Williams 2017:369).

Major vernacular architectural contributions to the islands began in the eighteenth and nineteenth centuries (Cooper and Zazzaro 2014:174). During this period, the early inhabitants built architectural structures that were significant to their culture and traditions (Bottero et al., 2020:1068). Buildings were constructed from a diverse range of geological materials available on the islands, especially during the eighteenth century (Bottero et al. 2020:1070). Early maps show the navigational and mapping knowledge that originated during this period (Hausmann et al. 2019). Therefore, the rich history of the Farasan Islands has contributed to an abundant and diverse range of historical sites, including Ottoman art, ancient villages, early mosques, pearl merchants' homes and coral houses (Hausmann et al. 2019). Most historical sites are situated on Farasan Island, while the smaller islands have rented fishing boats and some forts (Bailey et al. 2012:32). One of these houses is Hussein Al-Rifai's house (see Figure 4).

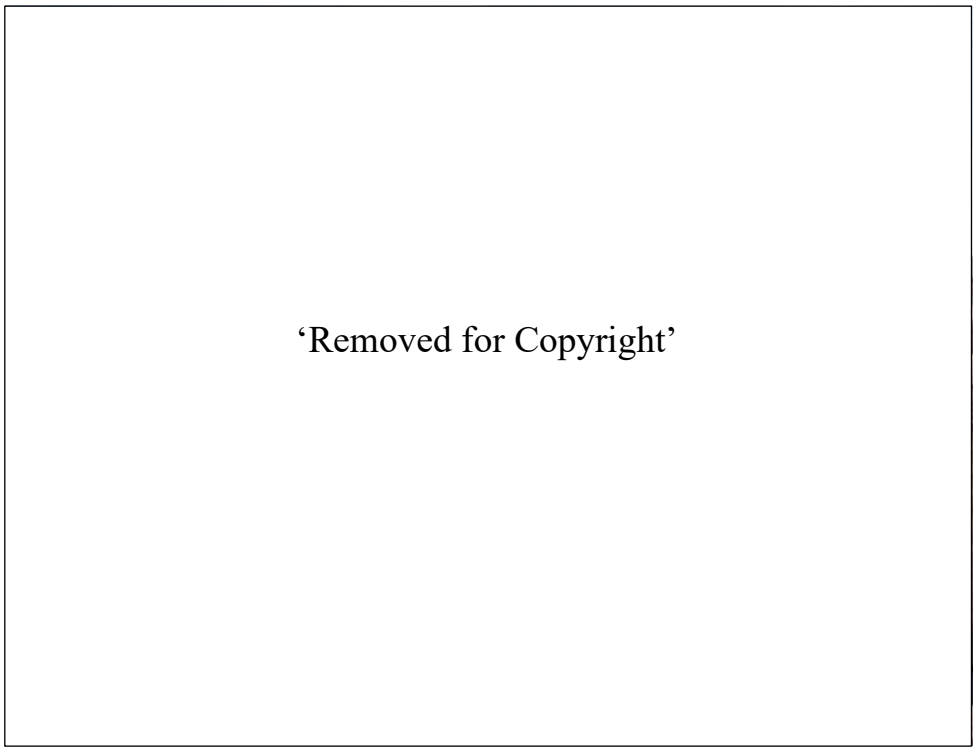

Figure 4: The entrance archway and exterior of Hussein Al-Rifai house, Farasan Island (Cooper and Zazzaro 2014:154).

1.6 Archaeology of the Farasan Islands

The Farasan Islands contain a range of archaeological sites that provide vital information about early human occupation, economy, and culture. The main archaeological sites are large shell middens on Farasan, Sajid and Qumah Islands (Hausmann et al. 2019), which are known to date back to between 5,000 and 5,500 years (Hausmann et al. 2019). Other than shell middens, archaeological studies of the islands are limited in scope and quality. The Gharrain site is located on the north-western side of Farasan Island and is estimated to be over 300 m^2 in size. This area contains pottery fragments and remains of residential buildings made of marine stones.

Substantial remains of buildings composed of ashlar blocks, rubble stones and materials dating back to the first century BC have been identified at Wadi Matar (Hausmann and Meredith-Williams 2017:374). These sites include large slurry blocks, door frames, inscriptions from southern Arabia, pottery and obsidian remains (Hausmann and Meredith-Williams 2017:374). Hausmann et al. (2019) also note similarities between the building architecture and pottery at Gharrain and two Nabatean shards (see Figure 5). Ancient inscriptions from southern Arabia have been found in the village next to Kumi (Hausmann and Meredith-Williams 2017:374).

Figure 5: Aerial photograph showing the ruins of buildings in Guerin village in the Farasan Islands (Photograph: A. Refaei).

Palaeographic studies have identified various inscriptions on the islands (Hausmann and Meredith-Williams 2017:376). This includes a Latin military inscription from AD 144 in al-Qusar (Hausmann and Meredith-Williams 2017:371). In 2005–2006, Francois Villeneuve and Laira Nehme conducted an archaeological study focused on the epigraphy and surface pottery at Wadi Matar (Bailey et al. 2012:50). Villeneuve and Nehme identified another Latin inscription, 11 ancient Saudi Arabian inscriptions and nine cuts into the bedrock (Cooper and Zazzaro 2014:163). The Latin inscription dates to AD 120 and indicates that the islands were considered part of the Roman province of Arabia (Bailey et al. 2012:36). The inscriptions discovered at Wadi Matar date back to the second half of the fourth or fifth centuries BC (Bailey et al. 2012:24). Further inscriptions found at al-Qusar and Khutub are contemporary to the two other Latin inscriptions (Bailey et al. 2012:48). The main threat to these sites and the cultural values that they represent is significant deterioration caused by cultural and natural forces. The following sections present these challenges.

1.7 Environment of the Farasan Islands

The Farasan archipelago comprises a large group of approximately 84 uplifted coral islands and islets (Ali and Al-Banna 2016:96). Among the 84 coral islands, only three are permanently inhabited (Alwelaie et al. 1993:289). Most of the islands are low lying and are composed of geological pavements and faulted blocks. The archipelago covers an area of around 1,050 km^2, and the nearby sea floor has a depth of 200 m (Agius et al. 2016:133). The archipelago's largest island is Greater Farasan, which is 66 km in length (Marine Protection Atlas 2020). Other islands include Sajid and Zufaf. Both islands were known as Portus Ferresanus in the first century AD (Marine Protection Atlas 2020).

The Farasan Islands have significant marine biodiversity value and were declared a marine sanctuary in 1996 (El-Serehy et al. 2020:1413). The constant deposition of sand on the shore has substantially contributed to relatively stable coastal dunes (Hausmann and Meredith-Williams 2017:363). There are numerous protected areas in the region, and breeding programs have been implemented to protect and re-establish species in their natural environment (Hausmann and Meredith-Williams 2017:375). While the environment and climatic conditions have historically been subtropical, industry is slowly contributing to the desertification of the region (Hausmann and Meredith-Williams 2017:375).

1.7.1 Geology and landforms

The Farasan Islands are characterised by geological features, specifically fossilised corals that form low-lying hills on the island surfaces. There are several faults, with irregular gullies and low cliffs in some island regions. The islands have little to no soil formation because the rock surfaces are incredibly rough. High coral reefs form steep sea cliffs, contributing to little or no vegetation cover. The islands are composed of limestone deposits covering the Plio-Pleistocene coral reef. The islands and islets are wide and flat with a low topography and shallow bays characterised by coral reef, limestone, sand, silt, and clay containing gypsum and anhydrite (Khalid et al. 2017:902). They have both tertiary and quaternary soils, including calcareous, shale or clay formations and reservoirs for evaporation.

1.7.2 Marine environment

The region has an extensive marine biodiversity, and most marine life is endemic to the area. Given its marine biodiversity, it is recognised as a United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Site and is listed as a protected region (El-Serehy et al. 2020:1413). The islands are home to a range of rare, threatened, and declining species (Gladstone 2000:1018). They also contain a variety of microalgae and corals. Hard corals and microalgae dominate the fringing reefs, which cover approximately 50% of the shoreline (Gladstone 2000:1017). The coastal waters between Farasan and Sajid islands have extensive and numerous seagrass beds, which are small and scattered in other areas. The marine life includes various species of dolphin (humpback, bottlenose, and long-snouted spinner dolphins) and a rare single species of whale (Gladstone 2000:1019). Endangered species include turtles (green and hawksbill) and a large number of other fauna, including seabirds and sea mammals (Gladstone 2000:1019). The islands are also home to various species of seagrasses as well as fish nurseries (Gladstone 2000:1017). Because the number of sea turtles in the region was slowly declining, hunting of sea turtles was outlawed (Food and Agriculture Organization 2003). There are various international and local seabird and raptor species that use the islands and their surrounding waters for breeding and feeding purposes (Gladstone 2000:1019). Marine life has been affected by fishing activities, while onshore nesting seabirds and sea turtles have suffered predation by feral cats (Gladstone 2000:1019). The dunes in the Farasan Islands are different from typical Arabian dunes. The beach dunes are composed of superficial deposits of sand. Being the habitat for numerous and diverse species, the Farasan

Islands deserve the global protection afforded to rare and threatened species for future generations.

1.7.3 Terrestrial environment

The saline waters characterising the Farasan archipelago have had a significant impact on the island's floral species. Topographical features such as rocks and soil have been affected by low moisture levels and extensive hot periods, which in turn have had an impact on the flora (Hausmann and Meredith-Williams 2017:363). Low rainfall and high aridity contribute to the region's hotter climate, and the port is often dry. Therefore, water availability is lower than in other islands. Terrestrial habitats consist of mangroves, coastal and sandy salt marshes, beach dunes, rocky hills, and desert fields (Gladstone 2000:1016). Gladstone (2000:1016) observes that the largest groups of mangrove stands are within the port of Farasan Island. The Farasan archipelago is part of a significant bird migration route. The wetlands are significant for migrating birds (El-Demerdash 1996:81). Seabird species inhabiting the region include noddies, crab plovers, ospreys, pink-backed pelicans, sooty falcons, brown boobies and spoonbill and bridled terns (El-Demerdash 1996:81). The islands are also home to several animals, such as the rare Arabian gazelle and migratory birds from Europe during winter, (Gladstone 2000:1018). Vegetation types include xerophytic herbs, shrubs, and perennial grasses. Tropical mangroves, Nubo-Sindian endemics and Arabian regional subzone species are also present (El-Demerdash 1996:83). Mangrove stands cover approximately 300 ha of Farasan Island. A lack of freshwater causes them to be patchily distributed and limited in number (Gladstone 2000:1018).

1.8 Tourism in the Farasan Islands

Tourism is a crucial pillar of Saudi *Vision 2030* (Alho 2019). Regions such as the Farasan Islands have been identified as suitable to boosting KSA's non-oil-based economy in the next 10 years (Kenner 2020). The clear waters, sandy beaches and mangrove forests of the Farasan Islands offer an attractive tourist destination. Moreover, the architectural designs of the buildings, which have been constructed with gypsum and other attractive rocks, attract many tourists. The Al-Najdi Mosque, which has a rich and extensive history, is one such site. The mosque, located at the centre of the greater island, derives its name from Ibrahim al-Najdi al-Tamimi, a pearl merchant in the early 1900s (Hisham 2014:8). While the mosque might appear ordinary outside, its interior architectural designs are precise and meticulous (Mirza 2019).

Another site is the Al-Rifai house, built over a century ago, which has distinct carvings in its gypsum walls, making it famous among tourists (Mirza 2019). Overall, in *vision 2030* document, the Saudi government considers the historical sites as instrumental to the Saudi *Vision 2030* objectives.

In 2016, over 1.5 million people attended the Mecca pilgrimage in Saudi Arabia (BBC 2016). If only a small proportion of this number visited regions such as the Farasan Islands, the country would generate significant tourism revenue. Once conservation efforts in the Farasan Islands have stabilised its heritage sites, issuing a higher numbers of tourist visas will become an objective of the post-oil economic plan. With flexible visiting regulations, the country's tourism is predicted to grow, achieving the program's core agenda.

The greater Farasan Island also include some coastal areas and beautiful beaches that attract tourists, which are characterized by their richness in pearl and fisheries, the diversity of marine life, and the abundance of coral reefs include:

1) The Abra coast is located southwest of Farasan Island. It is a vast coastal area that extends for 'several 15 kilometres' and is an ideal destination for fishing enthusiasts, as it is also great for spending an unforgettable night' under its clear starry sky (Urtrips 2021).

2) Al Ghadeer Bay is the largest bay of the Farasan Islands and the most abundant of environmental diversity and marine life, and its beaches are among the most beautiful areas on the Red Sea coast. The best beaches for snorkelling and pearl diving (Urtrips 2021). In addition, there is a five-star hotel, which includes luxury resorts, located on the coast of Al Ghadeer Bay, which further enhances the tourist place as a tourist attraction par excellence.

3) Ras El Qarn Beach is a new area that extends to Al Ghadeer Bay and is characterised by its cleanliness and the blueness of its waters, which tend to turquoise colour due to aquatic plants, and is ideal for swimming, recreation (Urtrips 2021).

4) Faqwa Coast, is a new beach that is also characterised by its picturesque nature and its great views (Urtrips 2021).

1.9 Conclusion

Vision 2030 is a critical road map towards modernising the nation and reducing its dependence on oil. It is only through proper management of tourism and protection and restoration of heritage sites that Saudi Arabia will achieve its vision. The power of experts from local and non-local archaeologists is the cornerstone of implementing the kingdom's vision in the Farasan Islands. Saudi *Vision 2030* depends on the implementation of goals represented in the establishment of a new state that is not dependent on oil. Hence, the Kingdom of Saudi Arabia dedicates all its efforts and funds to the realisation of this vision. In addition, the government should encourage the community to pay close attention to the historical buildings of the Farasan Islands, as they are a tourist attraction in Saudi Arabia.

Chapter 2: Natural and Cultural Heritage Management in Saudi Arabia and the Farasan Islands

2.1 Introduction

Saudi Arabia's Farasan Islands contain a number of natural and cultural heritage sites, which have drawn significant international and local attention. The significance of these sites has made it essential for government and stakeholders to not only monitor but also invest in the conservation and management of the Farasan Islands. These approaches have been undertaken from both cultural heritage and archaeological perspectives. The SCTH has developed an initiative aimed at improving tourism in the Farasan Islands. The core plan is to turn the islands into an ideal tourist destination. This program aligns with the *Vision 2030* initiative, which is aimed at reducing the country's over-reliance on oil for economic strength and security. To succeed in the Farasan Islands, *Vision 2030* will need to consider cultural heritage conservation efforts.

The conservation of cultural heritage sites in the Farasan Islands is aimed at making the islands an alluring tourist destination more than protecting the intrinsic cultural value of the sites. Conservation efforts will focus on the islands' distinctive features, including their rich cultural heritage, captivating beaches, coral reefs, ground water, mangrove forests, rare animals and birds and diverse marine species. The SCTH plan includes the development of hotels, maritime activities, coastal resorts, recreation, and heritage sites.

In terms of the initiative's implementation, the Saudi Heritage Preservation Society (SHPS) has started documenting all Saudi Arabian historical regions and islands, including registering the Farasan Islands in the UNESCO World Network of Biosphere Reserves. This project has attracted a range of opinions. Therefore, this chapter presents a comprehensive review of the effectiveness of the conservation and management approaches for the Farasan Islands by exploring issues affecting the ongoing conservation of cultural heritage sites and values.

2.2 Current Risks to the Cultural Heritage and Marine Environment of the Farasan Islands

The Farasan Islands contain a number of natural and cultural heritage sites, which have gained attention from both local and international communities (Ali et al. 2018:245). The islands have experienced a significant loss of biodiversity, threatening indigenous species and the overall ecosystem (Ali et al. 2018:246). According to Ali et al. (2018:249), cultural and natural heritage sites in the Farasan Islands have suffered from the exploitation of terrestrial and marine habitats and species (including native deer and fish). Gladstone (2002:30) describes the highly diverse aquatic ecosystem in the Farasan archipelago, which is nationally and internationally recognised for its marine mammals and seabirds, and argues that unless fishing activities are managed, they will pose a significant threat to resource sustainability, cultural values, and the conservation status of the area. According to Gladstone (2000:1016), although various human and industrial activities such as illegal hunting affect marine habitats, the overexploitation of fish stocks remains the most significant challenge to aquatic resources. Hasan (2008:14) argues that the Red Sea has suffered from the overfishing of multiple species. For example, a lack of efficient management of fishing activities has led to the overexploitation of sea cucumbers. The reduction in sea cucumber numbers has forced fishers to dive deeper in search of new sea cucumber stocks. Other than overfishing, the Farasan Islands have also had to contend with long-term oil pollution, which is a significant threat to the marine habitat. A study conducted by Mandura (1997:257) showed that the deposition of sewerage effluent in mangroves stands has stunted the growth of the mangroves. Sand crawling, land desertification and a lack of rainfall have also had major impacts on the mangrove forests Ali et al. (2018:249).

Climatic threats such as wind, storms and floods are difficult to avoid. Ali et al. (2018:249) assert that heritage sites in the Farasan Islands are vulnerable to climatic factors such as storms. *Ghubras* (an Arabic word meaning ‘wind with dust’), air pollution, rain, coastal erosion, and the scarcity of fresh water all have a negative impact on the heritage value of the Farasan Islands (Emara and Korany 2016:562). Emara and Korany (2016) conducted a case study to determine the effects of climatic conditions on historical buildings and sites, finding that the decay of stone due to weathering is increasing and should attract attention from both the academic community and the building industry. Natural stone is vulnerable to weathering, and the interaction between stone and environmental factors determines the type and degree of damage to stone building materials (Emara and Korany 2016:562). High rainfall causes leaching, while

strong winds can damage weak buildings. High temperatures can cause stone to crack, which can weaken structures. Stone deterioration has affected many monuments and buildings, as exemplified by the German house, named after the German occupation of the island (see Figure 6). The German house underwent significant decay and was eventually destroyed because of changes in temperature, moisture, and humidity, which caused cracking and powdering of stones, destroying its columns. Moreover, given the building's proximity to the sea, salt efflorescence accelerated its destruction.

Figure 6: A wall of the German house, showing its building materials (Photograph: A. Refaei).

Stone and masonry monuments, which comprise most of the cultural sites in the Farasan Islands, are negatively affected by adverse weather conditions, including extreme temperatures, humidity, salt and earthquakes (Emara and Korany 2016:563). These conditions cause stones to erode and decay or become completely detached following an earthquake, leaving only a trace of what once were monuments. Buildings such as the German house have suffered damage from salt, powdering of stone, destroyed columns cracks, and missing parts (Emara and Korany 2016:565). These culturally significant sites should be recorded, monitored, restored, and conserved through intervention programs.

Human factors are significant threats to the natural and cultural heritage of the Farasan Islands. Humans have long encroached on the Farasan Islands, initiating random urban construction (Ali et al. 2018:249). As the population has increased, there has been a growth in unplanned buildings, affecting the islands' cultural outlook. The construction of roads and modern

buildings, their encroachment into natural sites and coastal pollution caused by the dumping of waste are among the main threats and obstacles to heritage sites (Emara and Korany, 2016:565). But Ali et al. (2018:249) assert that tourism in the Farasan Islands is threatened by a lack of road networks, air transportation and sanitation. The creation of a functional road network for transport and communication and the availability of electricity, water and sanitation are vital in facilitating the preservation of existing heritage sites (Ali et al. 2018:). The Saudi government's support for conservation is demonstrated by its plan to construct a reliable road network to connect all villages in the Farasan Island, hence facilitating their reconstruction.

Threats that are of concern to archaeologists are partly attributable to the poor cooperation and communication among local communities regarding the importance of archaeological sites. There have been many practical challenges faced by the SCTH at the domestic as well as the international levels.

For many years, Saudi Arabia, along with many other nations in the Middle East, has relied on oil as a revenue source. While this has been beneficial, over-reliance on oil as a means of building the economy is hazardous because it suffers from price volatility and unstable markets (El Gamal and Azhar 2019). The kingdom's reliance on oil has created significant economic uncertainties (El Gamal and Azhar 2019). Therefore, KSA is seeking to diversify its economy and improve its competitiveness in the Arab region (Al Arabiya News 2020). Through the proper management and conservation of cultural heritage sites, Saudi Arabia aims to rely on tourism rather than oil to diversify its economy and achieve its *Vision 2030*.

As announced by Crown Prince Mohammed bin Salman, the son of King Salman, *Vision 2030* is a Saudi initiative to develop public services and diversify the economy. *Vision 2030* has three main objectives (Al Arabiya News 2020):

1. To connect the Arab world given KSA's significance as the location of two holy mosques (Mecca and Medina).
2. To become a global investment powerhouse and diversify revenue.
3. To make KSA a hub connecting Africa, Europe, and Asia.

Therefore, a key aim is to modernise KSA by seeking alternative streams of revenue, including the extraction of gold, phosphate and uranium as well as promoting tourism (Al Arabiya News 2020).

Under the direction of Crown Prince Mohammad bin Salman, Saudi Arabia has reshaped several of its policies pertaining to tourism. Tourists previously faced numerous hurdles when seeking visas to visit KSA. But, under the prince's leadership, the kingdom has devised an open-door approach to increase tourism (Arabian Business 2019). The most attractive destinations for foreign visitors are the five UNESCO World Heritage Sites: the At-Turaif District in ancient Ad-Dir'iyah, the Al-Hijr archaeological site (Madâin Sâlih), rock art in the Hail region, Historic Jeddah (the gate to Makkah), and Al-Ahsa Oasis (Al-Tokhais and Thapa 2020:103). The management of these sites has come under considerable scrutiny. According to Al-Tokhais and Thapa (2020:109), heritage sites face numerous management and conservation problems, including poor management systems and a lack of the requisite infrastructure to cope with tourism and site visitation. Urban heritage sites have received more care and management compared with non-urban sites (Al-Tokhais and Thapa 2020:109). Although the results are not entirely satisfactory, the Saudi government has attempted to implement measures to conserve natural heritage sites (Al-Tokhais and Thapa 2020:109), including increasing the number of heritage sites preserved in Historic Jeddah (Bagadar 2018:8). Therefore, promoting the conservation of World Heritage Sites in Saudi Arabia can increase tourist numbers in the regions.

2.3 Risks to *Vision 2030*

Scholars have suggested that it will be challenging to meet the *Vision 2030* management and conservation initiatives on the Farasan Islands. For example, Al-Subaiee (2016:319) argues that the biodiversity, trees, and water bodies in the Farasan Islands are unique and different from those in other regions of Saudi Arabia. Saudi Arabia's sustainability plan includes managing the ecological balance on the Farasan Islands, including tackling desertification (Al-Subaiee 2016:320). Unless strategic management plans are developed for not only cultural heritage sites but also natural heritage sites, the targets may not be attainable because of the lack of awareness among the community. Al-Tokhais and Thapa (2020:109) found that the people inhabiting the islands showed little interest in assisting authorities in managing and conserving the islands' heritage. Despite awareness campaigns, Farasan residents remain largely unaware of the risks and dangers that are having a fundamental impact on cultural heritage sites. For example, widespread hunting and fishing, including illegal fishing, are common in and around the islands (Al-Tokhais and Thapa 2020:109). If these are not addressed, the impacts of hunting and fishing

on flora and fauna will contribute to the overall deterioration of the environment. Further, there are no management strategies to monitor people accessing the sites.

Therefore, the island inhabitants must have adequate resources to decrease their dependence on fishing and hunting (Al-Subaiee 2016:324). Although the Farasan Islands are an excellent tourist attraction, they will not become a tourist destination without adequate anti-pollution programs and addressing the root causes of environmental decline. Improving the status of the Farasan Islands without addressing the main challenges will hinder the objectives of *Vision 2030*. In summary, the Saudi government needs to implement numerous conservation and management policies to achieve its vision. Additionally, enhancing the strength of using strategies and plans to effectively manage the islands and making Farasan Island to become once again one of the most important areas still retains its history. The objectives of the vision of the Kingdom of Saudi Arabia are to enhance the journey of Muslims coming from all over the world and their cultural experience through the establishment of museums and the preparation of tourist, historical and cultural sites and to facilitate their visits.

2.4 Cultural Heritage Management Strategies in the Farasan Islands

The natural and cultural heritage of the Farasan Islands is managed by a team of over '50 full-time and part-time staff including managers, technicians, law enforcement rangers, and support personnel' (UNESCO 2019:19). These teams are equipped with management stations, communication centres and land and sea transportation. Management personnel collaborate with the Saudi Wildlife Authority's (SWA) technical and research departments, which engage in activities such as ecological monitoring and environmental analysis and maintain coordination between local government entities and stakeholders (UNESCO 2019). Gladstone et al. (2003:758–759) argue that these managerial activities demonstrate the Saudi government's commitment to countering the deterioration of the Farasan Islands' natural and cultural heritage and the environmental and cultural heritage initiatives spearheaded by UNESCO and the Saudi government. The inclusion of the Farasan Islands in the UNESCO program began in January 2020 following the royal endorsement. Based on UNESCO's review, the islands are a biodiversity hotspot and a conservation priority (UNESCO 2019). One way in which the islands have been made a conservation priority is through the Man and the Biosphere Programme (MAB), an intergovernmental research program initiated by UNESCO in 1971 aimed at improving the relationship between humans and the environment (Benur and Bramwell 2015:217). MAB combines natural and social sciences with economics and

education. One approach of MAB is to improve human livelihoods and share benefits equitably. Benur and Bramwell (2015:217) highlight a further MAB goal of safeguarding both natural and managed ecosystems, hence promoting innovative approaches that achieve economic development.

Another vital element in the success of the cultural heritage conservation of the Farasan Islands is the involvement of stakeholders. Key participants include the SWA, the Jazan principality, government, and semi-government entities and the Farasan governorate. An additional factor is the close contact between SHPS and UNESCO. Ali et al. (2018:245) have made positive claims about the current management of the Farasan Islands, stating that heritage sites are managed in terms of maintenance, protection of the surrounding environment and meeting the needs of local communities, including the incremental development of tourist facilities to increase the number of visitors. There is a close relationship between heritage conservation and sustainable development. But urban development issues in the Farasan Islands have affected the ability to protect heritage sites.

2.4.1 Zoning

Zoning through the limitation of human and industrial activities has been implemented in the Farasan Islands to assist in the conservation of marine protected areas and various other natural habitats. These zones are named *himas*, which were traditional protected areas established by the Bedouin to protect water reservoirs in the Saudi Arabian desert (Gladstone 2000:1024). The establishment of these *himas* is aimed at protecting areas of natural heritage. Marine protected areas are designed to promote tourism, limit fishing, and protect fish nurseries, turtles, seagrass beds and mangroves. Table 1 shows how zoning has been effective in conserving the natural heritage of the Farasan Islands. These zones include a resource use *hima* aimed at the management of resources in marine protected areas, a biological *hima* aimed at conserving critical habitats, a natural *hima* aimed at protecting waterbirds, a special natural *hima* to protect biological diversity and a recreational *hima* to conserve recreational values and educational heritage. Zoning strategies are effective because natural heritage can be monitored and protected in sections.

Table 1: Zoning areas on the Farasan Islands

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2.4.2 Conservation Strategies and Initiatives for the Farasan Islands

Evaluating the effectiveness of conservation and management approaches in the Farasan Islands calls for an in-depth analysis of the tasks involved. Conservation strategies and action plans are more likely to be successful if they contain no gaps or loopholes that may lead to failure (Ali et al. 2018:254). Conservation approaches must also consider the risk factors driving the deterioration of buildings and the environment. Ali et al. (2018) collected data using a geographic information system and undertook a SWOT analysis (see Table 2) to identify suitable strategies and develop action and implementation plans. They propose a methodology by which to maintain heritage sites in the Farasan Islands (see Figure 7).

Table 2 . Strengths, weaknesses, opportunities, and threats to heritage sites Ali et al. (2018:252).

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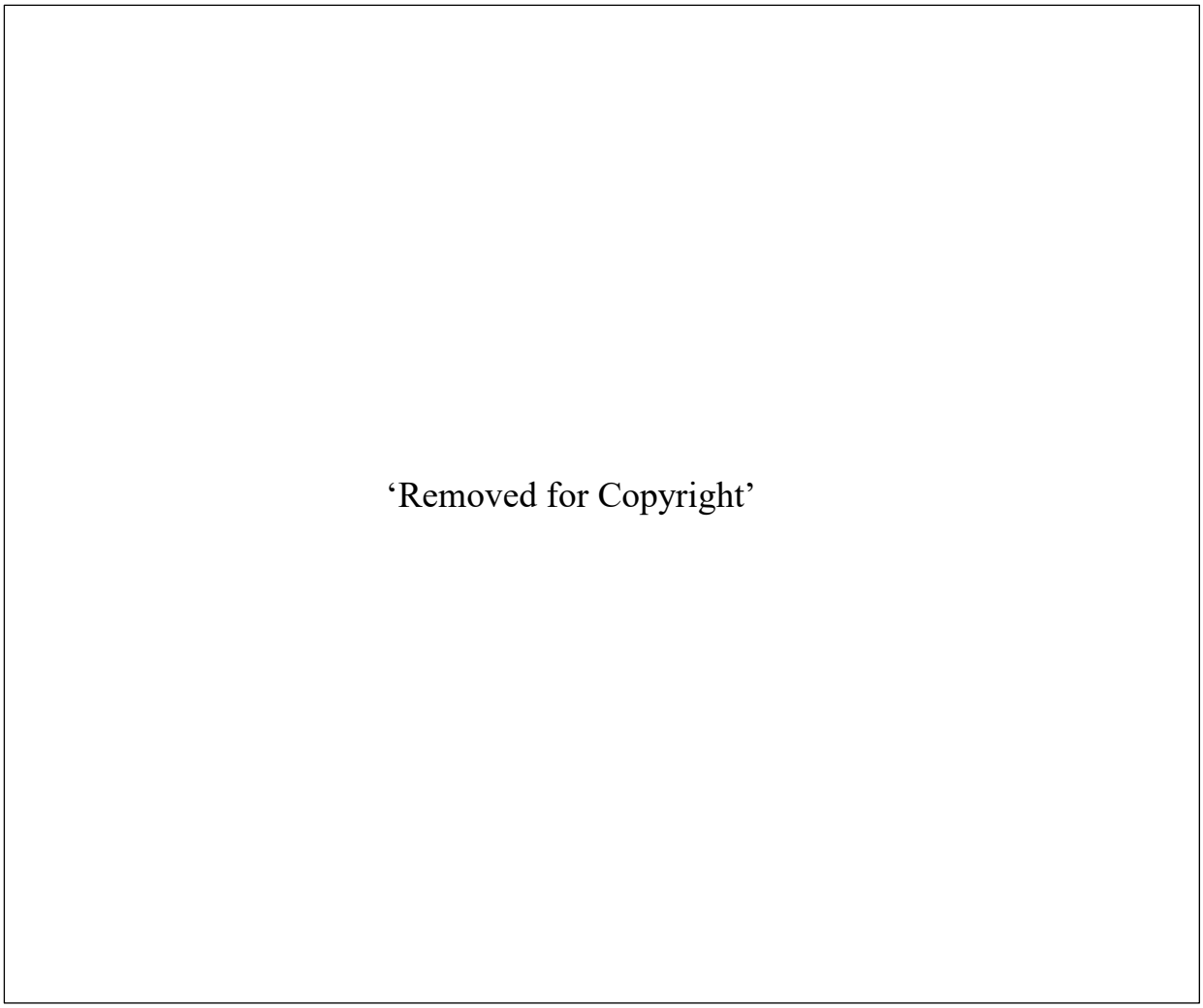

Figure 7: Proposed methodology for the management of Farasan sites (Ali et al. 2018:247).

Various techniques are needed to maintain the cultural heritage of the islands. Agius et al. (2016:173) argue that educating local communities about cultural heritage conservation is crucial. This long-term intervention involves changing current habits and attitudes. Sustainability in the region also depends on developing water treatment facilities (Agius et al. 2016:173).

The Saudi government is currently searching for effective management strategies for the Red Sea. Given that the Farasan Islands lie in the Red Sea, Gladstone (2000:1027) argues that his approach to managing cultural heritage sites can help improve the status of the Farasan Islands. The use of scientists and environmental specialists will increase the probability of achieving natural and cultural heritage protection objectives. The Red Sea conservation initiative has

brought together managers, scientists and decision-makers from the Gulf region and the global community, leading to positive outcomes (Gladstone et al. 2003:758).

Abuzinada (2003:39) notes that conservation of the Farasan Islands is a practical means of steering the country towards positive outcomes. Stakeholders are using an ecosystem approach to ensure sustainability on the islands (Abuzinada 2003:39). The conservation approach is centred on an integrated network of marine protected areas, which is aimed at minimising overfishing and other risks to marine life and establishing bird and turtle nesting sites. Consequently, there has been a substantial increase in the scientific knowledge about corals and reefs.

In 1986, Saudi Arabia implemented a nature conservation management initiative (Abuzinada 2003). This program included the Farasan Islands with the intention of creating a thriving tourism sector. But, deciding on management objectives and how to accomplish them has not been simple. Gladstone et al. (2003:756) state that conservation strategies have facilitated interventions. Most of the attention has been channelled to the improvement of the main island rather than surrounding islands.

The Farasan archipelago is subject to ongoing intensive research programs, with a key focus on gazelles, birds, and vegetation. Given the extensive preparation and action plans, the chances of success are high. Additionally, management has involved the opinions and participation of local communities. The government is working towards registering various Saudi archaeological sites in UNESCO world heritage lists, including Darb Zubaydah, the Hijaz Railway, the Shami Hajj Road, the Egyptian Hajj Road, the villages of Al-Faw, Rijal Al-Maa and Dhi Ain and the Oasis of Dumat Al-Jandal.

Ayachi and Jaouadi (2017:239) argue that apart from eliminating factors causing deterioration, the best aspect of conservation is improving the economy of the island, meaning that conservation strategies may have a fundamental influence on tourism in the Farasan Islands.

2.5 Conclusion

The management of the Farasan Islands is centred on established biophysical, socioeconomic, and ecological monitoring projects, which have been designed to align with the program objectives. Managing Farasan Island is one of the most important goals that can make the process of achieving the goals possible. These goals were set by the government of the Kingdom

of Saudi Arabia for its *Vision 2030*. Chapter 3 examines cultural heritage management and conservation strategies that may be relevant to the Farasan Islands.

Chapter 3: Reviewing Cultural Heritage Conservation and Management Strategies

3.1 Introduction

In its basic sense, management involves the organisation and coordination of financial and human resources to achieve specific organisational objectives. Therefore, because management involves many administrative functions that converge, integrate, and overlap to attain the desired outcomes, goal setting is not the ultimate step. In light of this, the management of heritage sites is aimed at achieving scientific, social and economic goals.

It is crucial to combine cultural and scientific knowledge when studying cultural heritage sites. The objective of most studies and interventions lies in safeguarding the cultural and historical value of buildings, including the adoption of structural engineering approaches (World Heritage Resource Manual 2013:16). The Burra Charter stipulates that a holistic and systematic approach is important in evaluating structures—in other words, buildings should be perceived as a whole rather than as individual fragments. When investigating a building, it is necessary to adopt a multidisciplinary approach that goes beyond the sole consideration of technical issues to include the site's history (Ifko 2016:2040). When developing a management plan for a cultural heritage site, collecting comprehensive information about the site's characteristics and functions is a necessary step (Al-Hamwi 1976:250). This is essential because it will help determine the site's needs during the management of a crisis.

Based on the objectives of *Vision 2030*, the processes to remedy structures should include the following steps: collecting data; investigating the history, structure, and type of architecture; surveying the structure; conducting laboratory tests and field research; and monitoring. The steps involved in evaluating the safety of buildings are sequential, and if they are not performed correctly, data uncertainty or assumptions may result in arbitrary decisions, leading to overly conservative or inadequate safety assessments.

This chapter reviews cultural heritage methodologies that may be relevant to the conservation of the cultural heritage in the Farasan Islands.

3.2 Conventional and Value-Based Concepts

The conventional approach to conservation, which resulted in the emergence of the conservation movement, is based on the conservation of historical sites for future generations (Kerr 2013:100). Conservation professionals began to highlight items deemed worthy of attention and refurbishing (Kerr 2013:98), resulting in the development of interventions to prolong the life span of building materials. In the mid-twentieth century, this strategy attracted attention from countries across the globe (Kerr 2013:100), resulting in various doctrines. The International Council on Monuments and Sites (ICOMOS) Venice Charter and Burra Charter are examples of such doctrines (Kerr 2013:100). Conventional solutions have been adopted worldwide and have resulted in benefits for historical sites.

The increasing recognition of the complexity of heritage has led to the value-based approach to conservation, which has emerged in several countries, including the United States and Canada (Kerr 2013:100). The value-based approach can be seen in the Burra Charter, which was initially created in 1979 by ICOMOS Australia (Kerr 2013:100). According to the charter, the values held by stakeholders about a site are paramount and should act as the foundation upon which to develop strategies to manage and conserve it. The Burra Charter has led to the development of more holistic conservation and management strategies based on values and cultural importance. According to this approach, a country's citizens can attribute values to sites of cultural heritage (Al-Hamwi 1976:250). In the value-based approach, the significance of a heritage location or structure is initially ascertained by promoting the participation of individuals with a vested interest in the site (Lourenço et al. 2005:54). The site's significance is then adopted as the framework upon which to develop conservation policies and strategies. This framework considers elements such as the state of the structure, the needs of the community and the rules of conduct. The values-based approach may be exemplified by the World Heritage Convention (Lourenço et al. 2005:55).

3.3 Examining Deterioration Factors: Remedying Walls

The Porto Cathedral, a Roman Catholic church in the city of Porto in Portugal, offers an inspiring example for how structures on the Farasan Islands may be restored. The Porto Cathedral is an important Roman historical monument and one of the oldest archaeological sites in the city. The towers of the cathedral have a cross-sectional area of approximately 10 m^2 and a variable thickness, with a minimum cross-sectional area of 1.7 m^2 at the bottom (Lourenço et

al. 2005:51). The towers are 35 m in height, meaning that the tower bases experience a stress of 1.0 N/mm^2. This is high for a building made of rubble masonry, whether or not it possesses mortar joints. Structures in the Farasan Islands are similar to the towers of Porto Cathedral, which have experienced significant cracks and out-of-plane movements. Steps have been taken to strengthen the cathedral towers, including the use of steel rings to reinforce the building along the two orthogonal directions. These rings were made from welded stainless steel plates connected to the towers using long inclined stainless steel anchorages (Lourenço et al. 2004:51). Determining the amount of steel needed is crucial to enable the smooth transportation of parts to the site, their subsequent entry into the building and the assembly of components. Most buildings do not contain internal stiffening elements (McCann and Forde 2001:78); therefore, the use of stiff steel frames is advisable because the rings should assume an 'H' shape. If buildings have outward bulges and corner cracks, short ties should be attached to the insides of the walls (McCann and Forde 2001:80).

Given the cultural significance of historical buildings (Lourenço et al. 2005; McCann and Forde 2001), a system to monitor damage should be installed (Kerr 2013:100). Systems should include the waterproofing of cracks, crack meters to monitor the most severe cracks, clinometers to measure tilt, strain gauges and humidity and temperature sensors (Kerr 2013:100). The values given by crack meters and clinometers are minute and depend on temperature. Variations in crack measurements are attributable to environmental conditions rather than gaping (McCann and Forde 2001:75–80). The same holds when measuring steel ties.

Another method has been used to reinforce the walls of historical buildings in Istanbul, Turkey. The approach used by Gunes et al. (2019) included the following steps:

1. Restoration of the current masonry walls.
2. Reinforcement of the existing foundations and development of new frameworks with additional load bearing structures.
3. Installation of a steel frame system inside the building, including columns and girders, and addition of new walls.
4. Application of steel mesh and concrete inside the walls to prevent collapse.

The assessment of the risks to historical structures and their restoration is becoming increasingly important. Historically, this assessment entails a number of steps and is a costly, time-consuming and sometimes dangerous procedure. Quagliarini et al. (2017) used a 3D-laser

scanner, a rapid, low-cost, and safe technique, to evaluate the status of the historic Santa Maria di Porto-Novo church in Italy, which dates back to the Marche Romanesque architectural period. 3D-laser scanning can be used to identify the presence of activated mechanisms in the macro-elements of historical buildings. The approach highlighted issues in the vestibule face, the north-west sidewall, the main facade, and the main apse of the church. This technique works well, particularly after earthquakes, because it is possible to accurately assess buildings from a distance (Quagliarini et al. 2017:160). This technique is important and useful in some buildings in the Farasan Islands that are beginning to collapse.

3.4 Graffiti Issues

Liquid chemicals have been successfully used to remove graffiti from rocks at an ancient petroglyph site in California, improving the value of the site and enabling archaeologists and history buffs to clearly view the original petroglyphs (Loubser 2021). Graffiti has also been removed from the Stairs of Saint Nicholas, one of the most famous tourist attractions in Beirut. This historical site connects the city with a century-old church (Woolfitt and Fairchild 2021:28). The stairs have been subject to much graffiti, which is often removed by authorities. Some of the graffiti has been removed using the air abrasive technique, which makes use of high-pressure cleaning (Woolfitt and Fairchild 2021:37). This technique was successful in cleaning the surface and completely removing graffiti (Woolfitt and Fairchild 2021:40).

The historical the house at Westminster Abbey in the United Kingdom was where the monks would meet with the abbot to 'hold chapter': to pray, read from the rules of St Benedict, discuss the affairs of the day, and decide on punishments (Westminster Abbey 2021). Despite its historical significance, the outer wall of the house was covered with graffiti. Thus, the entire wall was repainted (Westminster Abbey 2021). This technique requires photographs to ensure that the monument is restored to its original condition (Woolfitt and Fairchild 2021:1).

West of the town of Okotoks in Alberta, Canada, is a prominent landmark known as the Okotoks Erratic Big Rock, an historical site of great spiritual importance to the Blackfoot people. Graffiti on the rocks has been removed by authorities using the air abrasive technique and chemicals to ensure rocks were not damaged (Shaw 2016). The approach used to remove graffiti depends on the site. Since there are some graffiti that distort the buildings in the Farasan Islands, the government must adopt this strategy, which will return the historical value to these buildings.

3.5 Culture and Tourism

There has been a substantial rise in cultural tourism globally in the past few years. In light of this, the PICTURE (Proactive Management of the Impact of Cultural Tourism upon Urban Resources and Economies) project conceptualises a framework that may enhance the sustainability of tourism in heritage cities and towns (Tilquin et al. 2020:4). The creators of this project emphasise the conservation and enhancement of historical structures, assessing the effects of tourism on economies and environments and identifying creative concepts for sustaining positive tourism (Tilquin et al. 2020:4). In Saudi Arabia, Crown Prince Mohammad bin Salman has contributed 50 million Saudi riyals to the restoration of 56 historic buildings in the city of Jeddah (Okaz 2021). The prince stated that Historic Jeddah offers a shining example of the biographies of previous residents of the region. Researchers visit the city to learn these stories and study the designs of buildings and ancient architecture (Okaz 2021).

In the United Arab Emirates (UAE), many buildings have a high historical value and play a fundamental role in tourism (Bouzid et al. 2019:85). As architectural tourism increases, the need to conserve and restore historical buildings increases (Bouzid et al. 2019:91). The country benefits from both tourist revenue and the continued existence of historical buildings because of proper management by the UAE government. This is an example of the benefits of applying conservation concepts.

To promote tourism in China, the Chinese government has made efforts towards preserving traditional *tulou* dwellings of the Hakka people and redeveloping the area around the buildings (Bouzid et al. 2019:95). Local people were encouraged to participate in this conservation activity through the establishment of a County Tourism Development Office Village Supervising Team, which has helped in preservation. The government has benefited from revenue from tourists who come to see the *tulou* dwellings and experience the Hakka culture.

Angkor, an important historical site in Cambodia containing the ruins of the Khmer Empire, was once on the UNESCO List of World Heritage in Danger (Gillespie 2013:291) because of illicit archaeological excavations, political upheavals, and the presence of landmines in the area (Gillespie 2013:295). In 2004, a report was drafted to restore Angkor to its original state (Gillespie 2013:298). Consequently, the site was developed into a national park to preserve its heritage and promote tourism (Gillespie 2013:291).

There is also some link between tourism and culture in some, for example, traditional buildings found in Palembang in Indonesia include raft, limas, and Gudang houses (Lussetyowati 2015:401). Most of the heritage buildings in Palembang are restored in the architectural styles of mosques and temples (Lussetyowati 2015:402). The site is characterised by both Chinese and Arabian structures. A Chinese temple known as Chandra Nadi is at the center of Chinese settlement in Palembang (Lussetyowati 2015:403).

3.6 Seismic Shocks

Earthquakes can cause historical buildings to collapse and can have a major impact on world heritage sites. Traditional expertise in the strengthening and restoration of historical buildings varies from the south to the north of Italy (Cardani and Belluco 2018:9). Seismic damage in Italy occurred in Sicily and Calabria in 1783, where tremors caused the collapse of historical buildings. This led to the Borbonic Kingdom issuing regulations for buildings to be constructed using suitable materials and techniques to increase their resistance to seismic shocks (Cardani and Belluco 2018:10). Existing buildings were reinforced with new materials or repaired to maintain their typology (Cardani and Belluco 2018:8). These measures ensured that the buildings would be resistant to seismic shocks for a longer period.

The 1948 Fukui earthquake in Japan damaged the historic Maruoka Castle (Mitchelhill and Green 2003:2), which was subsequently reconstructed using the debris of the original building to conserve its cultural heritage. Kumamoto Castle, considered a pillar of Japanese culture, was destroyed by the Kumamoto earthquake in 2016 (Mitchelhill and Green 2003:4). During its reconstruction, seismic shock measures were employed, including structural tests and earthquake impact (Mitchelhill and Green 2003:5). The analysis involved identifying all weak points that were vulnerable to tremors for the purpose of implementing seismic reinforcement. These measures have benefited heritage conservation because many castles that were constructed in seventeenth and eighteenth centuries in Japan still exist today (Mitchelhill and Green 2003:4).

In 1925, an earthquake struck eastern Canada and part of the north-eastern United States. The earthquake originated in Quebec and spread, destroying the Gare du Palais, a famous historic building used as a railway terminal, and the heritage area around the St Lawrence River (Hough and Graves 2020:3). Since then, buildings have been constructed using masonry techniques to reduce their vulnerability to seismic waves up to a magnitude of 8 (Hough and Graves 2020:5).

Analysis of seismic waves and determining whether historic buildings can resist seismic waves using a national seismograph network can help reduce earthquake damage to buildings.

The 1933 Long Beach earthquake in Los Angeles destroyed the cultural heritage in the region, with the buildings collapsing because of their poor construction (Hough and Graves 2020:7). Since then, buildings have been constructed to resist earthquakes using flexible foundations that protect the building from vibration, reinforcing structures with masonry and modifying existing buildings (Hough and Graves 2020:8). The examples in Sicily and Calabria, Fukui, Kumamoto, Canada, and Long Beach demonstrate that buildings can be made resistant to earthquakes if constructed well. Historical buildings such as Maruoka Castle and Kumamoto Castle have been strengthened and still exist today (Hough and Graves 2020:7).

3.7 Utilisation of Iron and Steel

In Mexico City's Postal Palace, which was designed in the 1950s, was extensively damaged by an earthquake that hit Mexico in 1985. But, through the utilisation of steel during its second strengthening in 1990, the building was restored to its original shape and appearance and is now an attractive tourist destination (Herzog 2020).

The iconic Chrysler Building in New York is considered a leading example of art deco architecture. It was built in 1928 from a steel frame filled with masonry, with decorative metal cladding and 3,862 exterior windows (Stravitz and Gray 2002:87). The building was declared a national historic landmark in 1976 (Stravitz and Gray 2002:59). The building was reinforced with both steel and concrete in 2001 to prevent the structure from collapsing (Gunel and Ilgin 2007:2667).

The Peace Tower in Ottawa, Canada, also known as the Tower of Victory and Peace named in honour of the armistice of 1918 and the sacrifices made by Canadians during World War I (Said et al. 2005:53) was completed in 1927. The Peace Tower is an historical building commemorating military unit since the seventeenth century, when Canada was a French colony (Said et al. 2005:53). After a long period of inevitable erosion and harsh weather conditions, the sheet metal covering the Peace Tower was restored (Said et al. 2005:55).

3.8 Preventive Conservation

Preventive conservation is a technique used to reduce the deterioration of historic buildings and heritage sites that are not easily accessible. In preventive conservation, optimal conservation is created to help in all operations to protect historical buildings from deteriorating. (Van Balen 2015:102). Feilden and Jokilehto (2019:8) state that 'risk reduction is the most effective aspect of restoration. If sources of degradation may be eliminated or at least minimised, something valuable has been done. This involves identifying events that may lead to damage to cultural heritage sites and implementing administrative policies to counter these threats (Ringbeck et al. 2008:35). Urban planning to counter developmental pressures is also critical.

In 2010, Professor Stefano Della Torre identified that preventive conservation of historical sites should be done in three stages: primary, secondary, and tertiary prevention. Primary prevention involves the identification of all causes of deterioration and damage, while secondary prevention involves monitoring to enable early detection of damage (Van Balen 2015:103). For example, the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) in Rome uses preventive maintenance in conserving heritage using a multidisciplinary approach (Feilden and Jokilehto 2019:426). This is done by examining all possible maintenance options before developing a policy to help prevent vandalism, theft, or deterioration of world heritage sites (Feilden and Jokilehto 2019:425). For instance, white ants, which can destroy wooden structures, are one of the most serious and economically damaging pests (Dubai Municipality 2020:19). There are different types of white ants, but they all feed on cellulose (Dubai Municipality 2020:20). The Dubai Municipality (2020:19) uses chemical injections to eradicate insects living in historic buildings.

While modern architecture is beneficial for infrastructure, buildings that detract from the authenticity of a cultural site should be avoided (Ringbeck et al. 2008:36). Preventive conservation has proven to be highly effective for specific heritage sites worldwide. For example, in Mexico, preventive measures have made a critical contribution to the conservation of the National Palace (Rivero 2017:247). Specific procedures included institutional planning, training in preventive conservation, ensuring access to information on institutional planning and sensitising the public about the role they can play in preventing harm to cultural heritage sites (Rivero 2017:245).

In Europe, the Monumentenwacht, a ‘maintenance service for monuments and valuable buildings’, has been useful in the preventive maintenance and conservation of UNESCO World Heritage Sites in Flanders, Belgium (Cebron Lipovec and Van Balen 2008:3). Thus, preventive maintenance is likely to be beneficial in the Farasan Islands.

Another example is the Getty Conservation Institute, which uses preventive conservation for heritage sites based on the Burra Charter. The Burra Charter provides basic preventive conservation techniques to manage heritage in Australia. Article 1.9 of the Burra Charter outlines how to identify agents that cause deterioration of buildings, including water, which causes steel to rust, sunlight, which causes fading of finishes, and pests, which can damage textiles. Australia ICOMOS also provides ways to identify and eliminate agents to prevent damage to heritage sites (Mackay 2019:113). Article 1.4 of the Burra Charter highlights the benefits of preventive conservation in retaining the cultural importance and aesthetic value of heritage sites. The International Council of Museums also uses preventive conservation methods at heritage sites to prevent damage and deterioration. This is achieved by modifying the building’s appearance rather than changing the general structure of the building or its materials (Mackay 2019:118). Modifying buildings makes them more stable and resistant to the effects of damaging agents. Preventive conservation techniques employed by ICCROM, the Getty Conservation Institute and the International Council of Museums involve the identification and elimination of damaging agents before they can cause harm to historic buildings (Mackay 2019:122). The elimination of damaging agents makes sites more stable and resistant to climatic, environmental or earthquake conditions that can cause buildings to collapse.

3.9 Community-Based Conservation

When considering appropriate mechanisms for the preservation, protection and management of cultural heritage sites, an essential factor includes the contribution of a region’s citizens. The values attached to historical sites or monuments determine the site’s authenticity (Feilden and Jokilehto 1998:14). Göttler and Ripp (2017:66) argue that community involvement is crucial in conservation.

Different countries have adopted effective community-based conservation mechanisms over the years. For example, in Amsterdam, Heritage Day is held in the second week of September each year, when historical buildings in the city are open to the public for free. During the event,

site administrators train members of the public to become ambassadors for the conservation of cultural heritage sites.

In Cambodia, the Angkor World Heritage Site has received accolades from UNESCO because of how it has been managed over the years. The site had previously been on UNESCO's danger list for 10 years because of improper management. Consequently, the Cambodian government established the Apsara National Authority to manage the Angkor Archaeological Park, which has been instrumental in preventing looting, restoring the site, and boosting tourism (UNESCO 2013). Therefore, effective, and well-staffed committees responsible for the management of cultural heritage sites is a practical method in the protection, maintenance, and management of a world heritage locations.

The Farasan Islands are a culturally rich region. The local inhabitants have a historical connection to the region's cultural heritage sites; thus, implementing a community-based conservation structure may be feasible and effective. Having a committee solely dedicated to public awareness and the conservation and management of the islands could be instrumental in reducing the burden on the Saudi government while caring for the area. The government should ensure that the committee is well staffed and funded to help boost tourism and achieve its *Vision 2030* goals.

3.10 Restoration and Adaptive Reuse

Most world heritage sites are ancient structures that have become dilapidated over time. According to Feilden and Jokilehto (1998:90), restoration and rehabilitation are effective methods of preserving world heritage sites. Restoration is essential to improving the social and heritage value of sites that have lost their initial functional viability, thus becoming obsolete and decayed (Feilden and Jokilehto 1998:90). It helps to increase the overall heritage value of a region.

Samarkand is the third-largest city in Uzbekistan and one of the oldest inhabited Islamic cities in Central Asia (Belkhadir 2021). The buildings of this ancient city have been constantly restored and are well preserved because the city has survived the systematic destruction of its monuments (Belkhadir 2021). Among the buildings that have been restored is Prince (Timur), which was originally built in the fourteenth century and has been restored to its original form (Belkhadir 2021). Moreover, 95% of buildings in the ancient city of Shali, situated on the Silk Road, the ancient trade route linking China to the Mediterranean, have been successfully

restored (Ahram 2021). The project aims to revive the unique architectural heritage of the ancient city, which is one of the most important archaeological sites in Egypt and the world (Ahram 2021). Following its restoration, Shali will become a UNESCO World Heritage Site (Ahram 2021).

In Greece, the Agios Lazarus Church is an impressive example of Byzantine architecture built in the ninth century. The church was restored in the seventeenth century following the collapse of the three domes and original bell tower during the Ottoman era (Arab Traveler 2021).

In the Czech Republic, St James Church has undergone several rehabilitation exercises over the years. In 2010, rehabilitation of the church was undertaken, with a focus on its towers, the western frontispiece, the walls, and the window panels, which had been damaged by fire (EEA and Norway Grants 2020). These repairs helped improve the status of the heritage site, increasing the flow of tourists into the country.

3.11 Zoning and Management or Control of Historical Buildings

Buffer zoning is used to protect many heritage sites around the world. For example, the Shenyang Imperial Palace in China has been effectively managed using this method (Li et al. 2014:1115). The palace was zoned into a strong security area, an ordinary protection zone and a construction control zone (Li et al. 2014:1119). Buffer zoning allows areas to be managed effectively, depending on their specific requirements.

Architectural heritage in California is protected under a building code based on zoning (Cantell 2005:14). The California Historical Building Code, implemented in 1976, establishes regulations to restore historical buildings and protect them from destruction (Cantell 2005:16). This has reduced the costs of buildings conservation and ensured maximum safety (Cantell 2005:17). The code includes all buildings listed in California's National Register of Historic Places, facilitating the management of buildings and deployment of affordable conservation resources (Cantell 2005:19).

In Mennecy, a town near Paris, the high demand for housing led to an initiative by the Plan d'Occupation des Sols to demolish all historical buildings and construct new housing (Kropf 1996). But, statutory zoning laws were established to protect significant historical buildings and maintain their aesthetic value. This enabled the Ministry of Culture to identify and protect structures from destruction by establishing zones such as the Zone d'Amenagement Concerte

and the Zone de Protection de Patrimoine Architectural et Urbain. The zoning initiative helped to preserve all historical buildings in Mennecy (Kropf 1996).

The Queen Theater in Wilmington, Delaware, constructed in 1872, was initially protected by zoning before it was purchased by the Light Up the Queen Foundation (Kropf 1996:720). For 50 years, the building had sat empty (Kropf 1996:721). The researcher asserts that zoning of areas in Farasan can help ensure the effective conservation of its heritage sites.

3.12 Conclusion

By applying the conservation practices presented in this chapter, the Saudi government could effectively manage heritage sites on the Farasan Islands. This is an important consideration if places are to be conserved for tourists. Therefore, adequate protection, conservation, and management strategies for the islands are key to ensuring that the region achieves its *Vision 2030* goals of increasing tourism and reducing its reliance on oil in building the country's economy. Similarly for the developed countries, the recovery of tourism in any country in the world is a major goal, which a country can accredit with a certain percentage of the tourism sector.

Chapter 4: Cultural Heritage of Farasan Islands

4.1 Introduction

The aim of the thesis is to assess the effectiveness of strategies in the conservation of cultural and natural heritage. The COVID-19 pandemic prevented the researcher from travelling to Saudi Arabia and the Farasan Islands to undertake a detailed assessment of heritage sites. Prior to the COVID-19 lockdown, a brief field visit was made to assess the viability of undertaking a conservation assessment. Some details of Farasan heritage sites were documented during this reconnaissance and are reported in this chapter. Along with descriptions of the site inspections undertaken during this reconnaissance, data drawn from studies of these heritage sites are summarised in this chapter.

The information collected from the reconnaissance and previous research is used to determine the effectiveness of strategies to conserve and manage the cultural and natural heritage of the Farasan Islands. This chapter describes four heritage sites to determine the effectiveness of the different strategies described in Chapter 3. There are several villages on the Farasan Islands, including Muharraq, Sayr, Messela and Al Qassar (Kherami 2010:97). The largest island, located in the middle of the islands, is home to Al-Rifai house, Luqman Castle, Gharrain, Al-Qassar Heritage Village and Sayr Village. Qumah Island, about 23 km from the big island, is home to the German house. Sajid Island also has heritage and archaeological buildings. According to the nature of Farasan Island, its historical buildings are divided into two types: a) those that are scattered between villages and b) those that are adjacent and separated by narrow spaces.

The researcher visited archaeological sites in the Farasan Islands and identified factors that might cause damage and that the government can address. What is more, photos and notes of damage factors were taken in the buildings. Most of the buildings are in a state of deterioration as a result of climatic factors and the factors of human vandalism for these homes of historical value to the islands. Some of the factors that were beginning to appear for buildings and all the factors of damage appearing in buildings have been identified, as described in the following sections.

4.2 Cultural Heritage Sites Recorded on the Farasan Islands Reconnaissance Field Trip

During the reconnaissance trip, the researcher visited the following heritage sites:

- German house, located on Qumah island
- Hussein Al-Rifai house, located in the middle on the greater Farasan Island.
- Al-Amoudi house, located in middle on the greater Farasan Island.
- Turkish house, next to Qassar village on the greater Farasan Island.

Table 3: Cultural heritage sites recorded on the field trip

Building/site	Site type	Description
German house, 1918	Ruin	Built during the German occupation for military purposes
Hussein Al-Rifai house, 1923	house	Distinguished by the beauty of its design and engravings, this house is an architectural masterpiece. But humidity has turned it a darker colour. The back of the house displays damaged stones and eroded ceilings
Al-Amoudi house	house	Most traditional style on the islands
Turkish house	house	Uniquely traditional Turkish style on both the inside and outside, built using local materials

4.2.1 German house

Location: 16°39’18.07” N, 42°1’53.06” E, Qumah Island.

Type: Building ruin.

History and description: Located on the coast of Qumah Island, German house was built by the German Navy during World War 1 (see Figure 8) as a warehouse for weapons and ammunition. The island was a strategic location in the Red Sea during World War I. Despite the efforts made in constructing the warehouse, many of its columns have collapsed as a result of erosion. It is approximately 107 m long and 34 m wide.

Significant heritage features: The building is constructed from local stones.

Current condition: Figure 8 shows the building’s collapsed columns, which have eroded from the weather and humidity. Nevertheless, this historical ruin is a major tourist attraction.

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Figure 8: The German house (Photographs: A. Refaei).

4.2.2 Hussein Al-Rifai house

Location: 16°42’18.86” N, 42°7’21.44” E.

Type: Historical house.

History: 1923.

Description: This house was designed by Hussain Al-Rifai, who was influenced by the designs of the ancient Indian civilisation from his many trips to India. Al-Rifai brought two architects from India. The house is approximately 7 m high. Its external walls are covered with exquisite geometric designs in the form of friezes and ribbons, and the windows are decorative recessed arches. The interior walls are also covered with stucco decorations. The small upper windows above the friezes are made of imported stucco and coloured glass, while the ceiling is made of imported wood, carved with colourful geometric patterns (see Figures 9, 10 and 11).

Significant heritage features: The walls are adorned with geometric stucco decorations, particularly in the upper half. In the lower part of the building, decorations in the shape of segmented recessed shelves are framed by bright ribbons and topped with an arcade. These decorations are significant to the Muslim religion and reflect the cultural heritage style.

Current condition: The house has no security, and there are corrosion and cracks in the structure. Problem areas that require maintenance include the roof, the paint, and the flooring.

Figure 9: Hussein Al-Rifai house: architectural features and cracks (Photograph: A. Refaei).

Figure 10: Front of Hussein Al-Rifai house: humidity damage on the upper part and inside (Photograph: A. Refaei).

Figure 11: Back of Hussein Al-Rifai house: damage to internal features and conservation problems (Photograph: A. Refaei).

4.2.3 Al-Amoudi house

Location: 16°42’18.86” N, 42°7’21.44” E.

Type: Historical house.

History: 1910.

Description: The house is distinguished by its traditional Islamic style because Al-Amoudi would host pearl merchants visiting the island (see Figure 12). The windows were used as cupboards for storing items.

Significant heritage features: Most of the historic buildings in the Farasan Islands were built in the Islamic style, with windows built into walls.

Current condition: The building is in poor condition, with collapsed walls, rubble, and debris on the inside, rising damp on the walls, deteriorating render exposing the internal stone, stone falling out, rubbish and refuse on the site and vegetation growing inside.

Figure 12: Inside and outside of Al-Amoudi house (Photograph: A. Refaei).

4.2.4 Turkish house

Location: 16°40’10.75” N, 42°8’55.66” E.

Description: This type of building is rare on the island because it bears Turkish inscriptions. This building was the home of a Turkish merchant who lived on the island in 1970 and was used for rest and sleep during the pearl trade of previous years.

Significant heritage features: Turkish decorations are carved into the walls of the building. This important building shows the origins of the Turkish civilisation and decorations on the walls.

Current condition: This building has some damage and needs some repair to restore it to its original form. As shown in Figure 13, there are some holes in the walls and floor, which is completely covered by the collapsed ceiling. This building was mostly constructed from limestone.

Figure 13: Turkish house with holes and no roof (Photograph: A. Refaei).

4.3 Conservation Issues

During the field trip to the Farasan Islands, the researcher noted many areas of damage to the buildings that require attention and restoration. Also, the detection of the most important factors that cause the deformation of historical buildings. The lack of attention to these buildings has caused the damage to spread (see Figure 14).

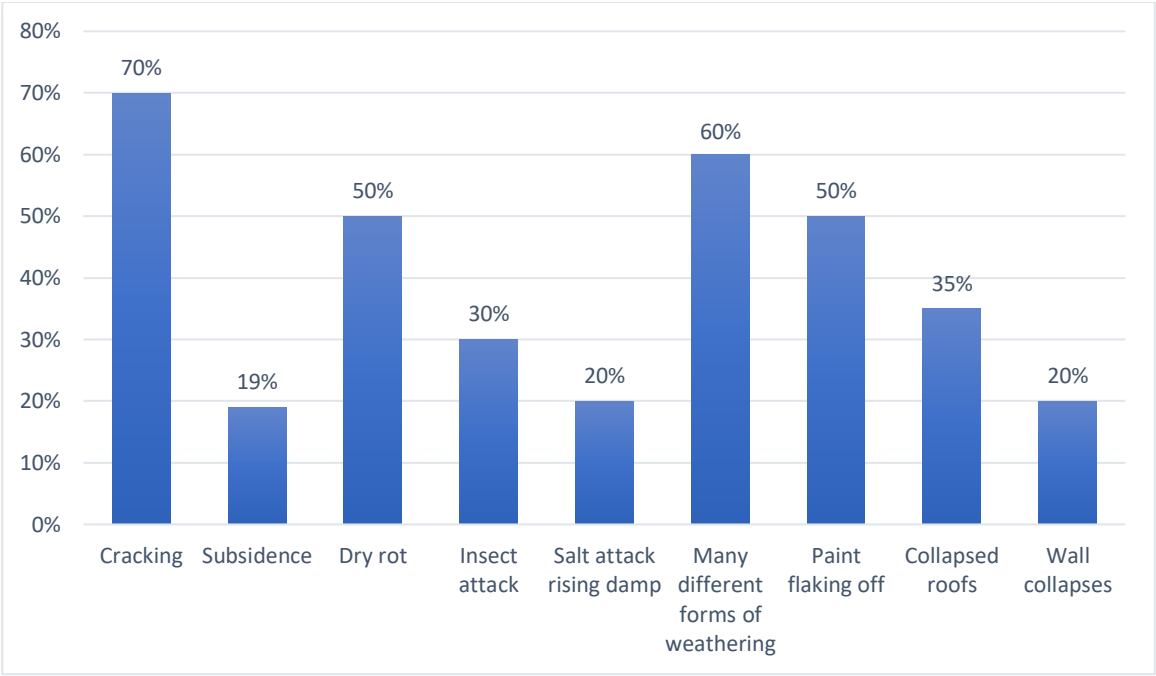

Figure 14: Conservation issues the researcher observed from the buildings above.

4.4 Previous Studies of Geochemistry and Composition of Farasan Island Heritage Sites

Using X-ray diffraction, Ali and Al-Banna (2016) undertook a geochemical and geological characterisation of all historical sites on the Farasan Islands, including Luqman Mountain, the German house, the Ottoman Citadel, Al-Rifai house and the Ghareen buildings. These buildings were typically built of stone composed of various minerals, including calcite, aragonite, albite, and dolomite (Ali and Al-Banna 2016:105). Geological mineralogy indicates the most popular type of stone was uplifted limestone. study on Hussein Al-Rifai house led to the identification of celestine, which is mostly found in sedimentary rocks, along with minerals such as gypsum and anhydrite (Ali and Al-Banna 2016:105). Figure 15 shows the geological materials found in the study.

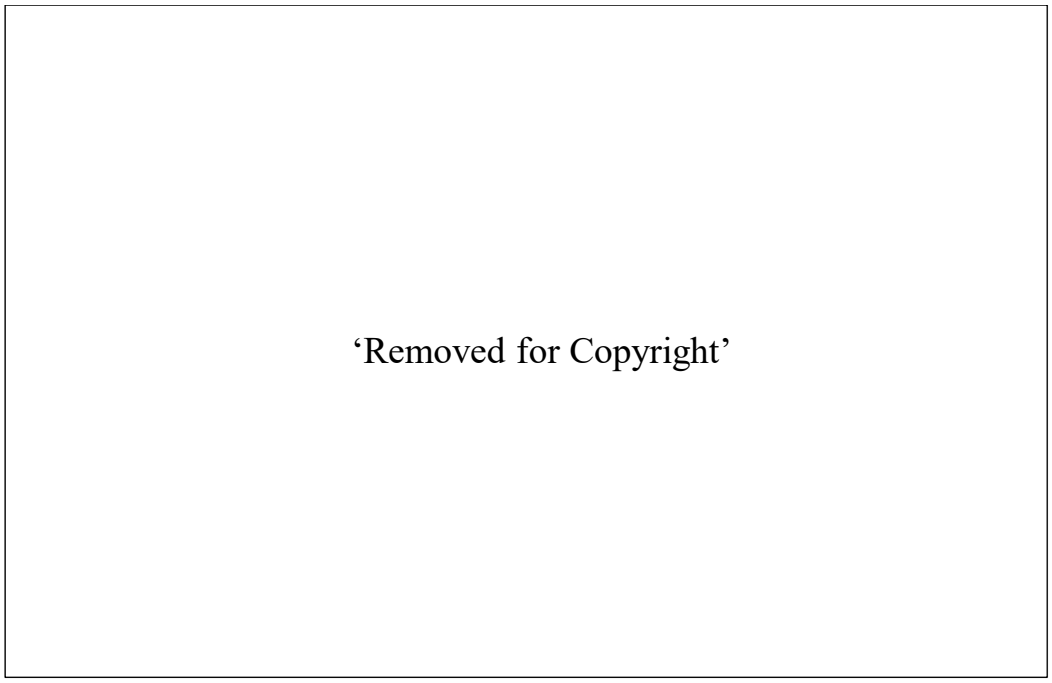

Figure 15: Composition of stone minerals.

Limestone was the dominant stone used in the construction of heritage sites (55%) in Farasan Island, followed by gypsum (19%), halite (15%), quartz (7%) and haematite (4%) (Emara and Korany 2016:563). Haematite or iron oxide is the most common mineral on the surface of the earth. It is a natural mineral found in sedimentary and metamorphic rocks and it is not surprising that it was found in building materials. These data are significant for developing methods to

protect elements from weathering. These minerals have varying susceptibility to weathering; thus, there is the need to consider different ways to protect them.

4.5 Deterioration of Heritage Sites on Farasan Island

Emara and Korany (2016) undertook X-ray diffraction to analyse the mineral composition of stones, which can turn to powder when exposed to salt. Figure 16 shows the distribution of minerals found in the powdered stone materials sampled from Farasan Island heritage sites (Emara and Korany 2016:564).

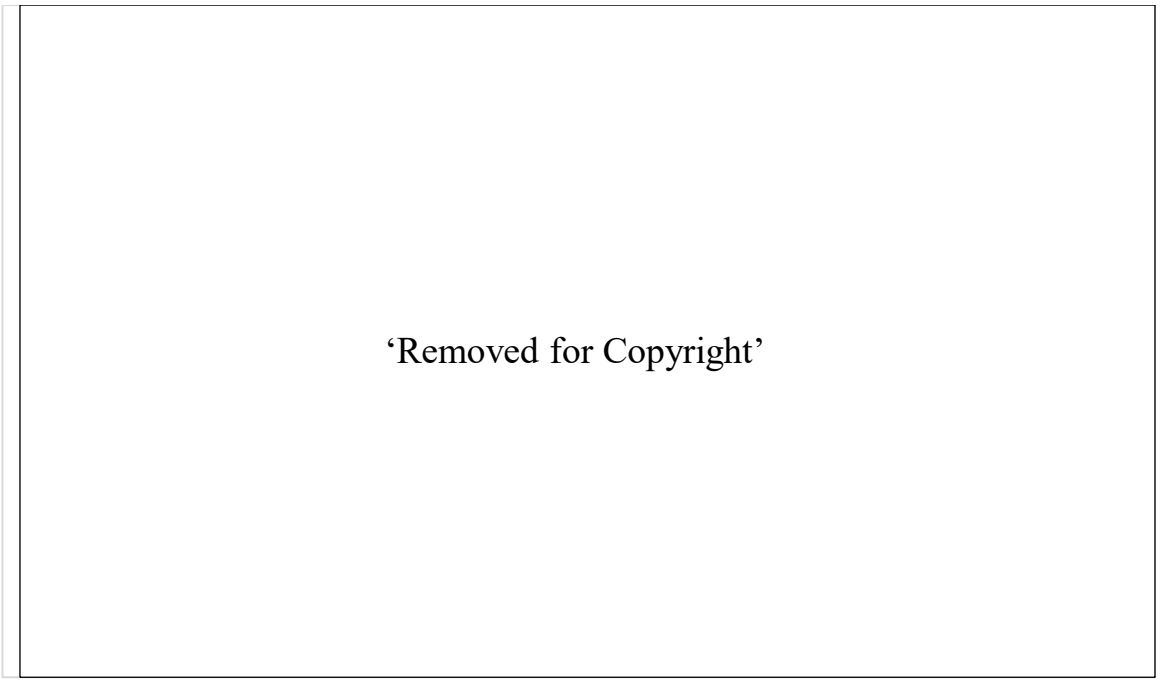

Figure 16: Percentage of minerals in powdered stone

It is clear that stones containing halite have the highest probability of turning into powder when exposed to salt (75%), followed by calcite (18%). Stones containing gypsum and quartz were not as susceptible (Emara and Korany 2016:564). The presence of halite in stone can generate stresses that may counter the tensile strength of the stone, turning it into powder (Emara and Korany 2016:564). The susceptibility of these elements creates the need for building stabilisation.

The same technique was used to analyse the Ottoman Citadel on Farasan Island to determine the characteristics of the stones used to build it (Ali and Al-Banna 2016:100). The data are

shown in Table 4 below. The building's porosity, deterioration period and compressive strength are known in this case. The Ottoman Citadel has a compressive strength of 15.95 Mpa, showing that any further decline will demand a boost in the building's tensile strength.

Table 4: Physical and chemical properties of stone used to build the Ottoman Citadel

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4.6 Value-Based Concept Analysis

Conservation of heritage sites is becoming more complex because of people's creativity and adoption of modernity. Heritage buildings are being renovated to urbanise and modernise them in a quest to meet the goals of *Vision 2030*. Table 5 shows sites and buildings in the Farasan Islands that have converted to a more urban layout.

Table 5: Complexity of urbanised buildings

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Table 5 shows that the conservation strategy depends on the historic value of the building or village. For example, Sayr village was not conserved which has significant from its historical value, leading to all the heritage buildings being demolished and urban buildings being erected. Buildings such as Al-Najdi house, Al-Rifai house and Farasani house have been conserved because of their architectural value. But, the effectiveness of strategies may be questionable because they have led to the destruction of buildings with some cultural heritage value.

4.7 Studies of Graffiti Analysis

A case study to determine the effects of graffiti at the Wadi Matar archaeological site was conducted (de Procé 2017:137). Data were collected to determine the effectiveness of measures to prevent graffiti on cultural and natural heritage sites in the Farasan Islands. de Procé (2017:137) assessed the aesthetic value of the buildings before and after the application of graffiti and whether measures to remove the graffiti would have negative or positive effects on the conservation of the buildings. A comparative bar graph, shown in Figure 17, was drawn to analyse the collected data. The figure shows that the presence of graffiti on historical buildings lowers their aesthetic value by 40%. The suitability dimension shows that graffiti may permanently damage buildings because of their porous walls, with the suitability of conservation measures declining by 20%.

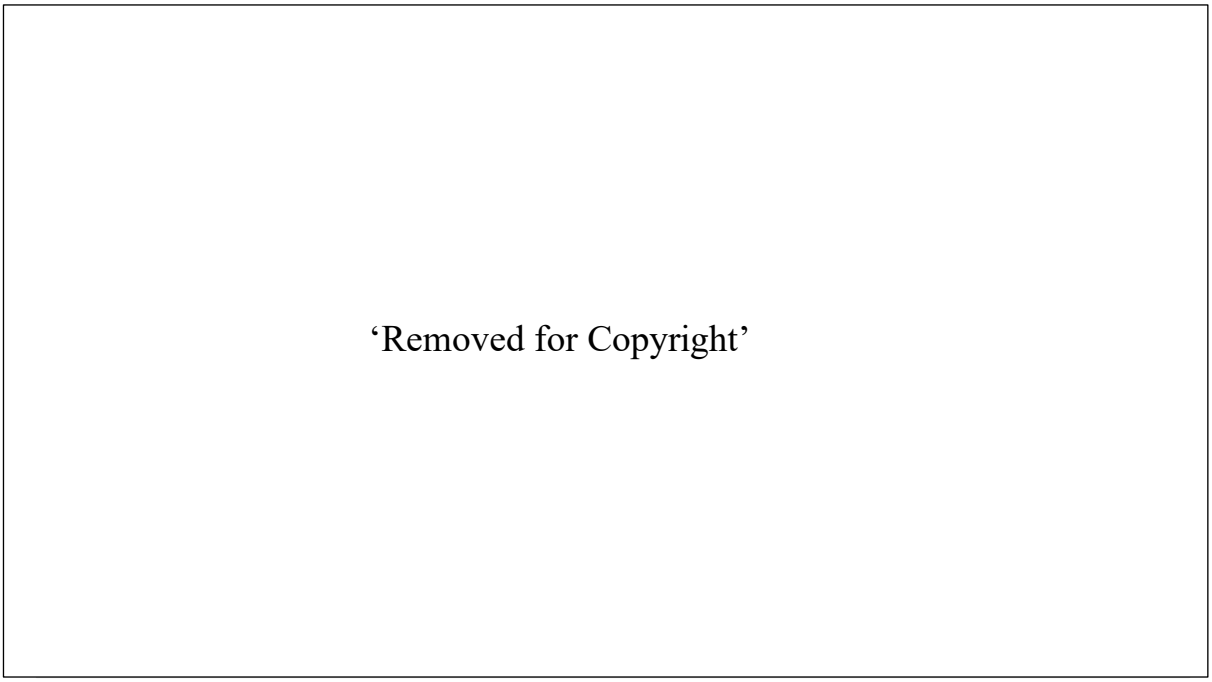

Figure 17: Effects of graffiti on historical buildings (de Procé 2017:137).

4.8 Culture and Tourism Analysis

Given the abundant natural and cultural heritage on the Farasan Islands, the establishment of reserves is important to encourage tourism focused on the islands' cultural heritage. Organised planning and preservation of the existing heritage on the islands may improve both local and international tourism. Figure 18 shows the relationship between tourism and heritage.

Figure 18*:* Relationship between tourism and heritage conservation (Ayachi and Jaouadi 2017:248).

Figure 18 shows that ecotourism has a low impact on natural and cultural heritage, encouraging conservation. Ecotourism depends on the existence of heritage, while tourists depend on the availability of ecotourism products (Ayachi and Jaouadi 2017:240). According to statistics from the Tourism Information and Research Department, which is associated with SCTH, the Farasan Islands received over 24,000 tourists of different ages in 2019 (see Figure 19) (Minister of Tourism of Saudi Arabia 2021). Further, the development of tourism is one of the initiatives towards achieving the goals of *Vision 2030* and the National Transformation Program 2020. Aims include achieving an annual revenue of about 531 million riyals, increasing the number of tourists to 375,000 annually, providing 1,760 hotel rooms and creating around 6,212 jobs (Saudi Press Agency 2021).

Figure 19*:* Tourists at Ahmed Al-Rifai house (Photograph: A. Refaei).

4.9 Seismic Wave Analysis

Using stratified sampling, Emara and Korany (2016) analysed 15 historic buildings on the Farasan Islands for their ability to withstand seismic waves, finding that they were designed with little consideration for earthquakes. The collected data are tabulated as a pie chart (see Figure 20). The majority of buildings (60%) were found to be unable to withstand seismic waves, 25% would be only moderately affected, while only 15% could resist seismic waves. These data imply that to effectively conserve buildings, it is advisable to employ additional techniques to prevent their collapse (Emara and Korany 2016:565). Buildings should be reinforced and have flexible foundations to prevent their destruction in the event of an earthquake.

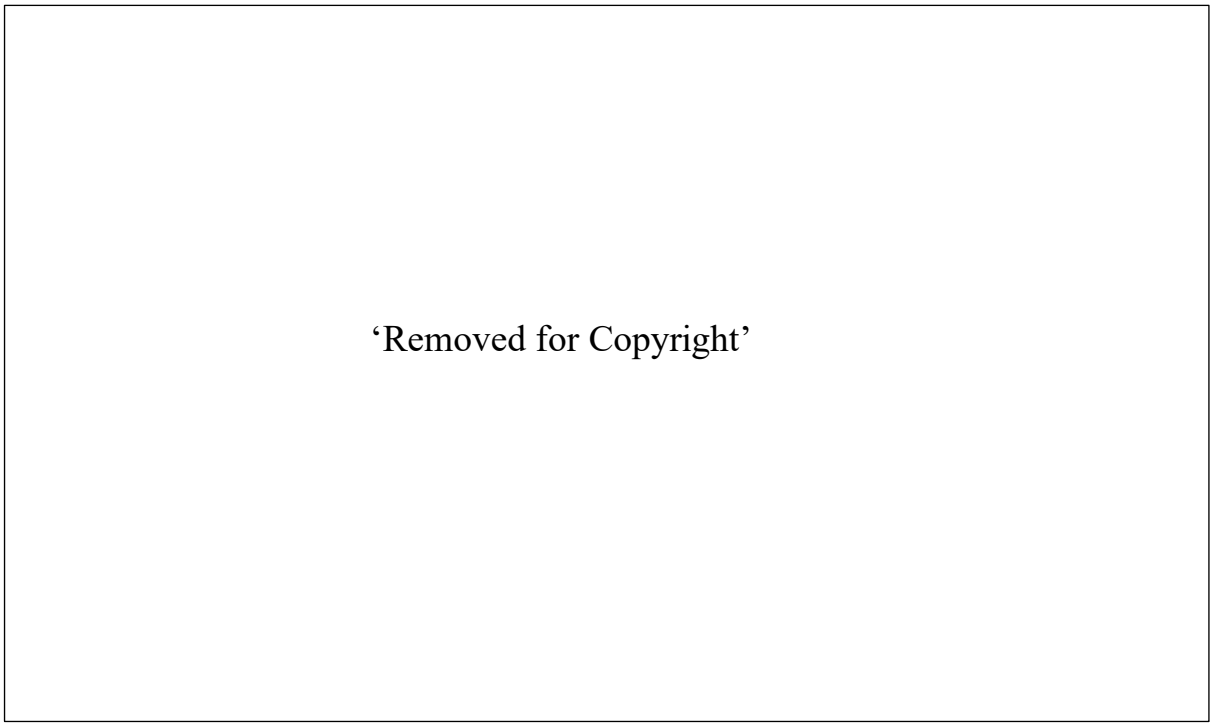

Figure 20: Effects of seismic waves on historical buildings.

During the reconnaissance trip to the island, the author discovered that earthquakes were infrequent. In the researcher trip, one local resident stated, ‘There have not been any earthquakes before, but there are slight earthquakes that you cannot feel’. In general, the buildings on the island are still strong and resilient; But, the structural integrity of the walls in some buildings needs to be improved for long-term stability.

4.10 Preventive Conservation Analysis

Having an understanding of the potential causes of damage to cultural and natural heritage sites can help prevent the destruction of these sites. For example, the deterioration of a building can be prevented or slowed by analysing its tensile stress and materials used in construction. Ali and Al-Banna (2016) conducted a case study on Al-Rifai house to assess its potential for degradation. The results are shown in Table 6.

Table 6: Characteristics of stone used to build Hussein Al-Rifai house

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The data shown in Table 6 suggest that it is possible to prevent the collapse of historic buildings through preventive measures such as analysing the mineral composition of stone. The deterioration of buildings on the Farasan Islands, especially the destruction of sedimentary materials used in construction, is mainly attributable to climatic conditions. The stone used to build Al-Rifai house is 85.80% calcite, which is prone to becoming powdery in harsh climatic conditions (Ali and Al-Banna 2016:104). The compression strength of Al-Rifai house is 36.57 MPa. This information can be used to determine whether a building could withstand an earthquake or whether it needs to be reinforced. During the field trip, the researcher found that houses were similar in terms of their construction and building materials, which are mostly local materials such as stones and tree trunks used to cover the roofs of houses.

4.11 Rehabilitation and Adaptive Reuse

Historic buildings need to be revitalised to conserve them. The rehabilitation of buildings under threat of deterioration is an effective conservation strategy. On the reconnaissance trip, the researcher estimated that 20% of the buildings begin to collapse. But, some buildings have been reconstructed and rehabilitated to retain their original features used in construction. The narrow pathways and streets of the main island show that it was once an urban centre.

Throughout the reconnaissance trip, the research found that there was interest in buildings and their reuse. In Sayr Village, there was interest in the restoration and rehabilitation of historical buildings, including Al-Rifai house and Al-Najdi Mosque, to preserve the beauty of their architectural designs (see Figure 21).

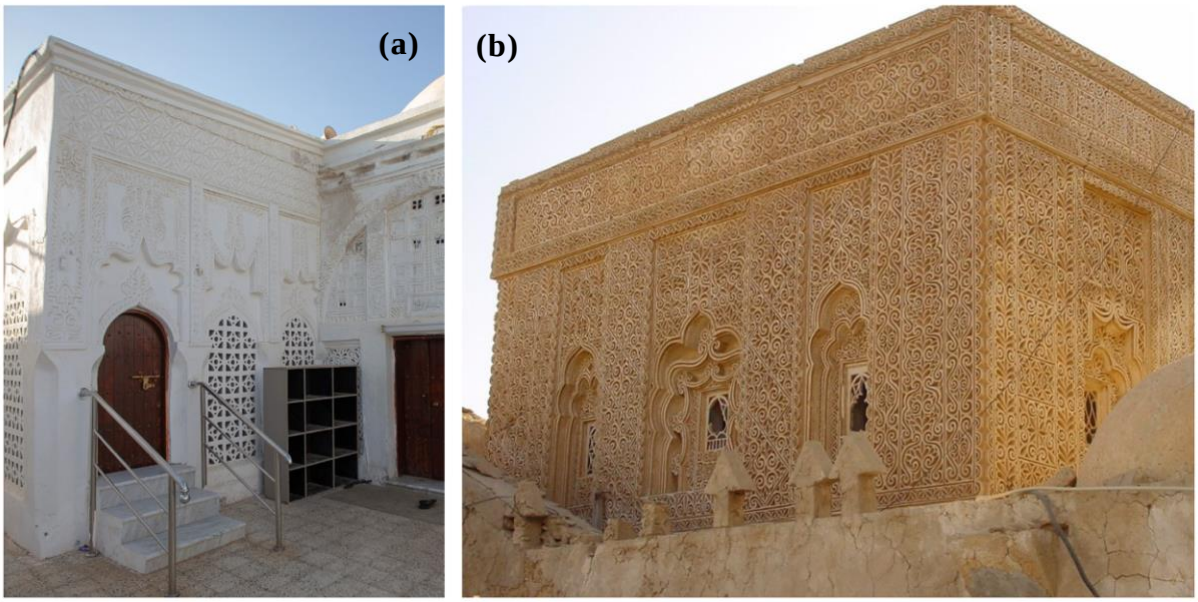

Figure 21*:* Adaptive reuse of (a) Al-Nadji mosque and (b) Ahmed Al-Rifai house (Photograph: A. Refaei).

4.12 Conclusion

It is important to draw the attention of the Saudi government to reduce the natural or human threats facing these buildings because they reflect previous cultures, and their value should not be underestimated. It is also important for Farasan Island to be well-defined to previous civilisations, and in particular for tourists who do not know about it. Thus, conservation and restoration will play a fundamental role in introducing to the tourists the previous civilisations that this island holds.

Chapter 5: Discussion

5.1 Introduction

As stated by Crown Prince Mohammed bin Salman, the main objective in conserving and managing cultural heritage is to diversify the nation's economy (Rashad 2016). Saudi Arabia is largely dependent on oil for revenue and its economy is vulnerable to market fluctuations and challenges. Tourism is perceived as a means of increasing Saudi Arabia's economic value by diversifying its revenue sources. For tourism to play a major economic role, the country's rich cultural heritage needs to be managed and conserved. For Saudi Arabia to achieve its *Vision 2030*, it must invest in other sources of revenue such as gold, uranium, and tourism (Al Arabiya News 2020). Based on the researcher's field inspections and review of the literature, strategies such as zoning, restoration, preventive conservation, and the utilisation of steel are suitable for managing, conserving, and restoring cultural heritage buildings. Scientific strategies are essential in preserving cultural heritage because they will help to find solutions to threats. Developing policies to conserve and manage heritage is important. For example, both the Venice Charter and the Burra Charter describe restoration, preservation and conservation of historical buildings and are applied worldwide. Both of these policies take into consideration the condition of historic structures, community needs and strategies to manage and conserve cultural heritage sites.

Rehabilitation and revitalisation strategies should be cautiously evaluated because inaccurate conclusions may enhance the destruction of historic buildings. Modifying historic structures with modern materials will help to stabilise them. Buildings must be subject to specific conservation and restoration strategies because of their inherent structural differences.

The abovementioned strategies may be effective in helping KSA achieve its *Vision 2030* and may play an important role in attracting tourists. Implementing these strategies in the Farasan Islands will enhance their appeal to tourists, especially those who have not previously visited the region. This will also work in the interests of the Saudi government, which should increase its efforts in conserving and developing urban heritage. The government should cooperate with experts to safeguard heritage buildings and privately owned sites. The SCTH could also make expropriation proposals (Lourenço et al. 2005:55). Governing bodies, with the aid of the National Urban Heritage Centre, should partner with various stakeholders such as the Crown

Prince and regional secretariats to come up with solutions for privately owned heritage sites (Lourenço et al. 2005:55). Another important factor is to protect buildings from human interference. For example, the zoning method may be used to close archaeological sites that may be significantly affected by human contact.

5.2 Tourism Development Projects in Venice

Authorities in Venice have sought to develop the tourism sector by conserving various tourist attractions and sites. The Ministry of Heritage and Cultural Activities is concerned with the protection and preservation of Venice's heritage, cultural and artistic identity, historical sites, and landscapes as well as promoting and implementing sustainable development. In addition to preparing a sustainable tourism strategy, the government is developing infrastructure and roads and taking measures to conserve the historical buildings of Venice's ecosystem for soundings to protect the city from further deterioration. It is one of the most important ways that can act positively in the preservation of historical buildings not only in Venice but all over the globe. Also, it is fundamentally for the Farasan Islands to have such plans, which will lead to the rise of the island's economy in terms of increasing tourism movement within it and creating job opportunities for the local population. Similarly, KSA is interested in registering additional sites with UNESCO through the restoration and conservation of its historical monuments in various regions, including the Farasan Islands.

5.3 Conservation and Preservation Methods

Conservation measures include the repair of walls and collapsed roofs and the removal of graffiti. The government should consider using iron and steel to support structures. The restoration of historical buildings to their original state would undoubtedly lead to an increase in tourism. Tourists are less interested in historical and heritage buildings when they have begun to collapse. Climate change is also a threat to historical buildings through increased rates of weathering to stone, as exemplified by the German house (Emara and Korany 2016:562). The deterioration of stone from weathering can be minimised using preventive conservation methods. The strengthening of structures using iron and steel is an important strategy for historical buildings. Restoration work on the Porto Cathedral demonstrates that stainless steel rings and iron ties are effective in improving the cathedral's stability (Lourenço et al. 2004:55). These same methods could be applied to the buildings in the Farasan Islands.

5.4 Relationship Between Conservation and Tourism

Tourism is strongly related to the conservation of cultural heritage sites. Ayachi and Jaouadi (2017:245) suggest that promoting ecotourism will attract tourists to the Farasan Islands. The conservation and management of cultural heritage will enable international tourists to have a positive experience while generating revenue. Therefore, the Ministry of Tourism and Ministry of Culture in KSA should collaborate to create a sustainable relationship between tourism and heritage. In 2017, around 45 million tourists visited Mecca (SABQ 2017). Even if some of these visitors visited the Farasan Islands, this would raise significant revenue. To encourage these visitors, investments should made in cultural heritage conservation. The Ministry of Tourism should create events to market KSA's heritage to attract more tourists.

5.5 Preventive Conservation

Preventive conservation may prove to be the best method for Saudi authorities. Preventive conservation involves training the community and agencies to conserve heritage by providing a greater understanding of cultural heritage values. The cultural heritage of the Farasan Islands would benefit from preventive conservation measures aimed at curbing the destruction and elimination of heritage. Therefore, the government should engage multidisciplinary teams, including archaeologists, conservationists, cultural heritage consultants and labourers, to tackle these serious issues. Researching the geology of the islands is critical to understanding buildings' structural issues and developing specialised strategies to prevent collapse. The utilisation of steel and iron may also play a fundamental role in reinforcing walls. The powdering of stone can significantly weaken a building's structural integrity and lead to collapse. Although buildings are made from stone and mortar, the use of steel and iron will be important to prevent collapse. Stone with a high percentage of halite has a higher likelihood of turning to powder when exposed to rain or wind. If stone walls only have a small amount of halite, only a small percentage will turn to powder, which will not lead to significant impairment of the walls.

5.6 Conclusion

The proper management and conservation of the Farasan Islands using the strategies discussed above could help in the achievement of *Vision 2030*, the goals of which may not be met if the Saudi government and various stakeholders do not improve the state and infrastructure of the Farasan Islands. Continued efforts to transform the Farasan Islands through the conservation and management of its cultural heritage values may pave the way to increased tourism. In Addition, comprehensive management of historical and cultural buildings can attract tourism, and from here the Saudi government can adopt these appropriate strategies and methods. It will also provide a future vision of what will happen to the Farasan Islands and what necessary future measures can be taken. As a result, it will also be one of the best tourist destinations in southern Saudi Arabia.

Chapter 6: Conclusion

6.1 Introduction

The thesis was aimed at determining the effectiveness of management and conservation strategies to enable KSA to achieve its *Vision 2030* objective to boost tourism revenue. Currently, Saudi Arabia is reliant on oil for its economic stability. But, fluctuations in the global oil market poses threats to the Saudi economy. Therefore, the government is looking to tourism as a solution to salvaging the economy. Given its rich cultural heritage, the government has been rehabilitating Saudi's cultural heritage sites with the aim of attracting tourists. Heritage conservation and management strategies and their relevance to *Vision 2030* have been reviewed. A variety of strategies to conserve heritage sites may be applied in the future. These include examining factors leading to the deterioration of historical structures and providing reinforcement. Value-based conservation, which arose when conservationists began to understand the complexity of heritage conservation, is playing an important role.

The increase in the number of tourists to Saudi Arabia has prompted the need to improve heritage conservation. The *Vision 2030* goal to boost revenue through tourism may lead to some unintended consequences. Preventive conservation measures may be taken by involving the community in rehabilitation and restoration and dividing heritage sites into zones to facilitate the deployment of resources to reduce risks from development.

6.2 Significance of the Findings

The findings of this thesis show that conserving and managing heritage sites is essential in achieving the Saudi *Vision 2030*. The existence of heritage sites will be determined by how committed the government is in managing and conserving them. The findings are significant in that they show the need for and effectiveness of various strategies in conserving and managing heritage, as well as their strengths and efficiency. these and appropriate methods and strategies will have a beneficial impact on the Farasan Islands. As a result, the power of community the government, and organisation should join hands to tackle these phenomena that appeared in Farasan islands.

The findings are vital because they demonstrate the intensity of heritage management and conservation. If these strategies are not effective in conserving more than 80% of the existing heritage, developing more appropriate methods will become urgent. The findings can help to reveal threats to heritage in KSA and inform the Saudi government about whether these threats have been eliminated. Given that the findings should inform future recommendations, and analysis of limitations should also occur. Importantly, the results will help the Saudi government to identify whether it is taking steps to achieve the *Vision 2030* objective of creating an alternative revenue source for the Saudi economy.

6.3 Contributions of the Study

By analysing the effectiveness of strategies used to conserve and manage heritage sites, this study contributes to the *Vision 2030* goal of generating revenue from tourism. Additional contributions include the analysis of the effectiveness of strategies through the collection and evaluation of data. This has led to the identification of effective strategies for managing and conserving the historical buildings of the Farasan Islands.

This thesis has uncovered information about the Farasan Islands, including its climate, its marine, and terrestrial environment, its geological features, and its history. This demonstrates the potential for the Farasan Islands to attract tourists from all over the world. The study further contributes by providing reliable sources for how the management and conservation of heritage sites may significantly affect *Vision 2030* through proper management, conservation, and restoration strategies. This study discussed the causes of weakness in the tourism sector in Farasan, by analysing its manifestations and causes, its relationship in management strategies.

6.4 Future Directions

There are many ways in which strategies may be utilised to conserve and manage the cultural heritage of the Farasan Islands. This includes protecting aesthetic elements from degradation and destruction. The Saudi government should encourage multidisciplinary collaborations between archaeologists, heritage architects and specialists and the community to ensure the preservation of historical buildings. Further, steel reinforcements to strengthen the foundations and walls of buildings, a strategy that has not been utilised in the buildings examined in this study, should be considered. Preventive conservation offers another necessary solution and is a means of detecting potential threats to heritage sites. Future studies should be conducted to

answer questions about the conservation and management of heritage sites and make recommendations for the government. There is also a need to develop strategies to cater to climatic conditions and threats, including rainfall and temperature changes over time, that may affect the Farasan Islands. Human factors such as overpopulation were not addressed in this study, but the Saudi government should these into account to reduce threats to cultural heritage. Future research should explore the effectiveness of the strategies used to conserve and manage heritage sites to show whether these strategies should be adopted or rejected. It is further recommended that future studies analyse techniques that have a high rate of success.

The Saudi *Vision 2030* is divided into strategic goals to enable its effective implementation. Among these goals is the recovery and strengthening of the tourist sector to attract both local and international tourists. This study has shed light on the importance of cultural heritage and the role it plays in promoting tourism. *Vision 2030* is based on the implementation of practical and effective strategies and programs that may be monitored. This thesis discussed a range of appropriate methods that may be used to promote cultural tourism in the Farasan Islands, which is one of the most important group of islands in the Red Sea and the most significant tourist attraction in southern Saudi Arabia. The vision of the Kingdom of Saudi Arabia is to enhance the journey of Muslims coming from all over the world and their cultural experience through the establishment of museums and the preparation of tourist, historical and cultural sites and to facilitate their visits.

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