

Cultural and Natural Heritage Sites

Tunisian scale





Co-Evolve4BG

Analysis of Threats and Enabling Factors for Sustainable Tourism at Pilot Scale

Cultural and Natural heritage sites

Tunisian scale



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OVERVIEW

The present document was produced in the framework of **Co-Evolve4BG** project “*Co-evolution of coastal human activities & Med natural systems for sustainable tourism & Blue Growth in the Mediterranean*” in relation to Threats and Enabling Factors for maritime and coastal tourism development on a national scale” Co-funded by ENI CBC Med Program (Grant Agreement A_B.4.4_0075).

This document constitutes the **Deliverable 3.1.4.9** (Cultural and Natural heritage sites – Tunisian scale) of the **Activity 3.1.4**(Threats and Enabling Factors at National scale: Overview) under the **Output 3.1** (Integrated analysis of Threats and Enabling Factors for sustainable tourism at MED scale) of the project.

REVIEW

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Abstract

This report aims to introduce the Tunisian Cultural and natural heritage (archaeological sites, historical monuments, urban complexes) located in coastal zones to introduce and integrate them into a sustainable development project while identifying the difficulties and risks they face. The information provided was collected from several official sources interested in archaeology.

The document is structured as follows:

- Section 1 Review of current state of the site
- Section 2 Threats and Risk Analysis
- Section 3 Recommendations

I. Introduction

Tunisia is considered one of the distinguished countries, historically and archaeologically, on the southern shore of the Mediterranean Sea. Archaeological evidence indicated that its history dates to prehistoric periods. Since that time, many civilizations have succeeded in their domain, including the Phoenician civilization, the Roman civilization, the Islamic civilization, and the Ottoman civilization. Each of them has left important archaeological evidence. Faced with the importance of this archaeological and historical heritage, it is important to protect it to ensure its survival for future generations. In this article, we will try to study some of the most important examples of this heritage (archaeological sites, historical monuments, urban complexes) found on the edge of the sea; to determine its importance and to identify the dangers facing it; to determine the priorities and needs of this legacy; and to formulate a strategy to protect it (Fig. 1).

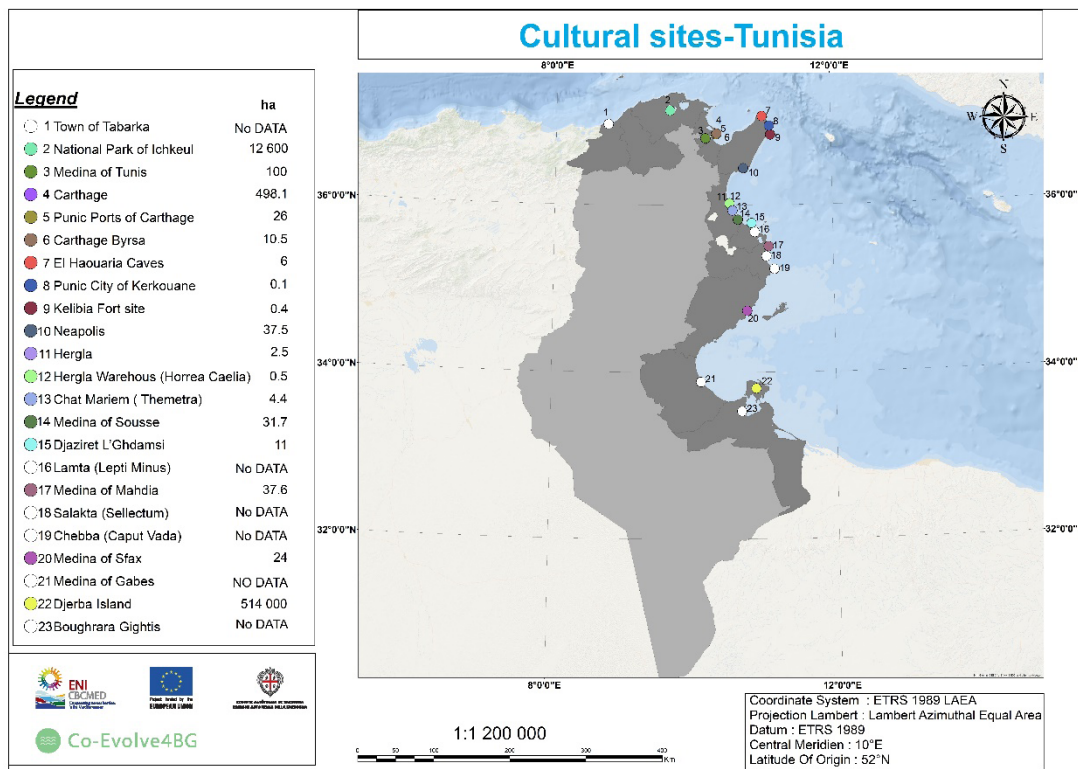


Figure 1. Natural and archaeological sites of Tunisia

II. Site of Tabarka town

II.1. Review of current site conditions

Tabarka is a small port located in the north-west of Tunisia, situated on the seaside and bordered by the mountains, the village is known for its famous economic activities (coral and cork). Tabarka was known in the past: first under the name of Tabarka as a Phoenician trading post, then under the Roman domination, its port was prosperous; thanks to the products it exported.

Christianity became integrated into it with the erection of numerous basilicas, churches, and necropolises. In the sixteenth century, Charles V installed the Lomellini family there. They established a powerful trading post, defended by the enormous castle built on the island and developed fishing and coral work as well as the export trade (Gourdin and Longerstay, 2008).

The archaeological site is open to visit. It is limited and naturally well protected. The archaeological remains are in an excellent state of conservation.

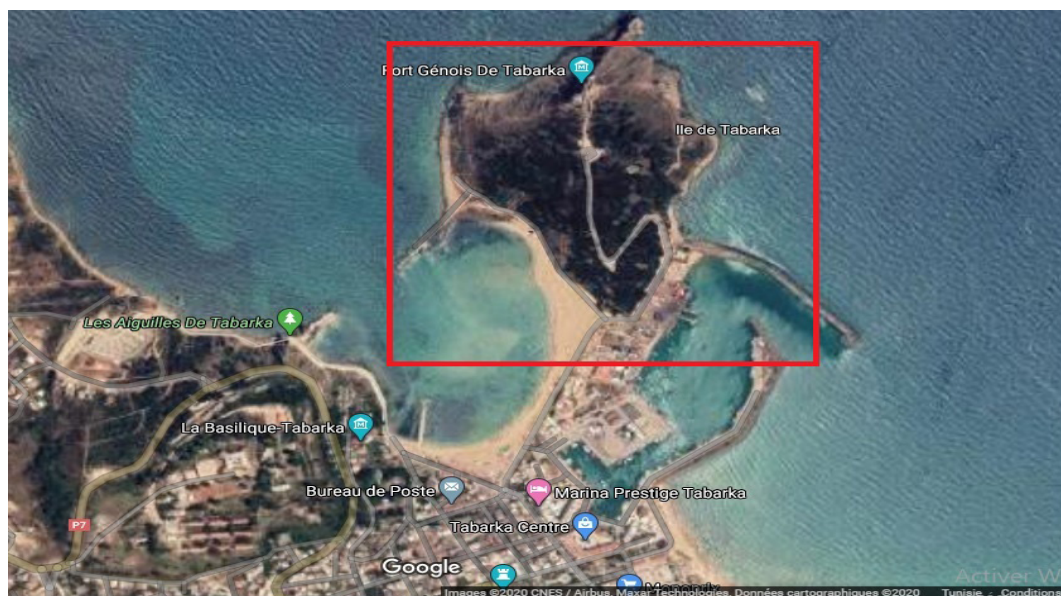


Figure 2. Location of the Tabarka town¹

1

- source, Google Earth Pro.



Figure 3.View from Tabarka²

II.2. Threats and Risk Analysis

The site faces the problem of urban expansion, as it is in the center of an active tourist city especially with the existence of the problem of private property, which is considered a legal obstacle, whereby the owner of the land can sell it and possibly build on it according to some examples of urban development that require monitoring.

The archaeological site is exposed directly to the sea winds and the natural factors that contribute to its degradation.

II.3.Recommendations

It is necessary to restore the archaeological site by maintaining and cleaning it, strengthening the stones that make up the monuments on it, and providing them with layers of protection from natural factors to avoid their erosion and it is important to have a fixed team for maintenance.

2

- source, tunisienumerique.com

III. National Park of Ichkeul (Bizerte)

III.1. Review of current state of the site

Lake Ichkeul is the last large freshwater lake in a chain that once stretched along North Africa. Characterized by a very particular hydrological functioning based on a double seasonal alternation of water levels and salinity, the lake and the surrounding marshes constitute an indispensable relay for hundreds of thousands of migratory birds that come to winter in Ichkeul.

The site has benefited from national and international protections. Classified as a biosphere reserve by UNESCO in 1971 (Man and the Biosphere program), it was listed as a UNESCO World Natural Heritage Site in 1979, meeting the following criterion: “contains the most representative and important natural habitats for in situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation”.



Figure 4.Location of the ICHKEUL National Park Bizerte³

³

- source, Google Earth Pro



Figure 5. View from the ICHKEUL National Park⁴

III.2. Threats and Risks Analysis

The site is threatened by the construction of dams on upstream rivers, which increases the salinity of the water and disrupts the ecosystem.

Increased salinity of Lake Ichkeul, which threatens hundreds of thousands of migratory birds.

III.3. Recommendations

Ended the agricultural use of the lake waters to reduce salinity and thus allowing the return of many bird species to the park.

⁴ - <https://whc.unesco.org/fr/list/8/>

IV. Medina of Tunis

IV.1. Review of current state of the site

Situated in the north-east of Tunisia, the Medina of Tunis is one of the first Arab-Muslim cities of the Maghreb (698 AD). Capital of several dynasties with universal influence, it represents a human settlement that bears witness to the interaction between architecture, urbanism, and the socio-cultural and economic effects of earlier cultures. Under the Almohads and Hafsids, from the 12th to the 16th century, it was considered one of the most important and richest cities in the Arab world. There are many testimonies of this and earlier periods. Between the 16th and 19th centuries, the new powers gave it many large mosques, between the 16th and 19th centuries, the new powers built many large mosques, zaouias and medersas (Binous J., 1970).

The inscribed property covers an area of about 280 ha and has all the components of an Arab-Muslim city. It consists of the central medina (8th century) and the northern and southern suburbs (13th century). There are 700 historical monuments, spread over seven areas, among which are the Zitouna mosque, the Kasbah Mosque, the mosque of Youssef Dey, the gate of Bab Jedid, the gate of Bab Bhar, the Souk El-Attarine, the Dar El-Bey, the Souk Ech-Chaouachia, Dar Lasram, the Medrasa Es-Slimanya and El-Mouradia and the Zaouia of Sidi Mehrez (Zbiss, 1981). The Medina of Tunis, historical heart of Tunis, registered since 1979 in the world heritage of the UNESCO.

The medina of Tunis

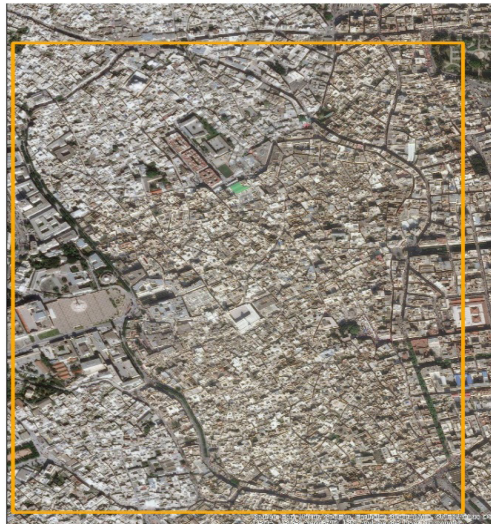


Figure 6. Location of the medina of Tunis⁵



Figure 7.View from the Medina of Tunis⁶

IV.2. Threats and Risks Analysis

- The site faces the problem of urban expansion, as it is in the center of an active tourist city. Especially with the lack of land for construction which prompted residents to construct tall buildings that distorted the aesthetic side of the Medina.
- Illegal buildings spoil the appearance of the ancient city.
- Illegal architectural elements business and looting

IV.3. Recommendations

- Preparing a protection and management strategy for the Medina of Tunis.
- Restoring the existing monuments, strengthening their infrastructure, valuing them, and exploiting them for tourism.
- Strengthening of civil and associative societies given their effective role in the protection of the Medina.

V. Archaeological site of Carthage

V.1. Review of current state of the site

Carthage is an extensive archaeological site located on a hill overlooking the Gulf of Tunis. It was the Metropolis of the Punic civilization in Africa and capital of the province of Africa in Roman times. Carthage played a leading role in antiquity as a great trading empire. Its soil contains vestiges that bear witness to more than two thousand years of history, the oldest of which date back to the beginning of the 8th century BC. During the long Punic Wars, Carthage was destroyed in 146 BC. AD and rebuilt on the ruins of the ancient city. Founded at the end of the 9th century B.C. by Elyssa-Didon and having sheltered the mythical love of Dido and Aeneas, Carthage engendered a warlord and strategist of genius like Hannibal, a navigator-explorer like Hannon, and an agronomist of great renown like Magon. Through its historical and literary resonance, Carthage has always nourished the universal imagination (Fantar, 2007).

The property includes vestiges of Punic, Roman, Vandal, Early Christian, and Arab presence. The main known components of the site of Carthage are the acropolis of Byrsa, the Punic ports, the Punic Tophet, the necropolis, the theatre, the amphitheatre, the circus, the villa district, the basilicas, the Antonine baths, the cisterns of La Malaga and the archaeological reserve (Lancel S., 1992).

The archaeological site of Carthage is a site scattered in the current city of Carthage, classified as a UNESCO World Heritage Site since 1979.



Figure 8. Location of the archaeological site of Carthage⁷



Figure 9. View from archaeological site of Carthage⁸

V.2. Threats and Risks Analysis

Despite the various preservation measures, the site remains today subject to various pressures from its environment that threatens its sustainability. The depopulated suburb of Tunis at the beginning of the 20th century, Carthage is largely endangered by rapid urbanization.

The lack of suitable means for the stabilization and maintenance of the ruins, their destruction by erosion and runoff, as well as their overexploitation by the tourism sector, are problems that Tunisian institutional actors must face.

V.3. Recommendations

Revising the decommissioning procedures has led to a reduction of the non-edificant area and to constructions sometimes at the gates of the most emblematic places, among others the area of the Punic ports.

8

- source <https://whc.unesco.org/fr/list/37/>

VI. Archaeological site Punic Ports of Carthage

VI.1.Review of current state of the site

The Punic ports of Carthage refer to the port facilities of the ancient city located on the territory of present-day Tunisia. During antiquity, the Punic city of Carthage was often referred to as the “empire of the sea”. Carthage, founded by great navigators such as the Phoenicians, achieved its greatness largely thanks to its mastery of the sea. The remains from the Punic period are rather rare and often few, as is the case for the two Punic ports of Carthage. One distinguishes nevertheless very clearly the two basins of different shapes, one with military utility (the round one), the other, rectangular in shape, hosted the commercial activities. The harbors were refurbished and transformed by the Romans following the victory over Carthage. When visiting the site, one is far from imagining the complexity and the size of these ports, capable at the time of their size to shelter 220 ships according to traditional literature sources and to support intense commercial exchanges (Abdelmajid *et al.* 1993). A small museum is held near the site. The models which it shelters, reconstituting the port according to the archaeological research carried out on the site, are welcome to have a more precise idea. The site is open to visitors and well deformed from its original aspect.



Figure 10. Location of the Archaeological Site Punic Ports of Carthage⁹

9

- source, Google Earth Pro.



Figure 11. View from the Archaeological Site Punic Ports of Carthage¹⁰

VI.2. Threats and Risks Analysis

The site faces the problem of urban expansion, as it is in the center of an active tourist city. This is due to the desire of many inhabitants to build in this district, which has become one of the most prestigious in the city, which threatens to destroy the underground monuments and distort the aesthetic of the site.

The site is directly exposed to natural factors especially with the rises of the sea level, which threatens to submerge the site, as well as its direct exposure to winds and waves.

VI.3. Recommendations

- Reinforcement of the protective fence to resist erosion and protect the site.
- Restoration of the site and construction of a protective fence.
- Carrying out archaeological underwater excavations to reveal the monument as the land excavations were already mostly operated in circular harbor and in some points in the rectangular one.
- Preserving, enhancing, and managing plan.

VII. Archaeological site of Carthage-Byrsa

VII.1. Review of current state of the site

The Punic district of Byrsa is located halfway up the hill that carried the city's citadel on its summit and formed its center. In the immediate vicinity of the National Museum of Carthage and within its walls, it is an open-air annex.

This neighborhood was developed during Hannibal's time (at the beginning of the 2nd century B.C.) and is a residential neighborhood with its streets intersecting at right angles, its multi-story blocks divided into apartments like our modern buildings and its stores opening onto the street on the first floor.

The Byrsaneighborhood was destroyed and burned along with the whole city in 146 B.C. A huge layer of earth fill protected it from being levelled and this neighborhood has come down to us emote the urban living environment of Punic Carthage in the 2nd century B.C. and the immensity of the destruction that the city suffered.

Archaeological site of Carthage-Byrsa: The archaeological site is open to visit and is classified as a UNESCO World Heritage Site.

Byrsa Hill



Figure 12. Location of the Carthage-Byrsa Archaeological Site¹¹



Figure 13. View from the Carthage-Byrsa Archaeological Site¹²

VII.2. Threats and Risks Analysis

The rising sea level threatens an important part of the archaeological site. The site is facing the problem of urban expansion, as it is in the center of an active tourist city; this is due to the desire of many residents to build in this area, which has become one of the most prestigious areas in the city, which threatens to destroy the underground monuments and distort the aesthetic of the site.

VII.3. Recommendations

- Prohibition of all types of construction works around the site.
- Applying urgently the Protective and Enhancement Plan of Carthage under the authority of National Institute of Cultural Heritage (INP) and the Ministry of equipment and urban management as indicated in the law of 1994 regarding the Cultural Heritage.

12 - source <https://whc.unesco.org/fr/list/37/>

VIII. Kelibia fortress

VIII.1. Review of current state of the site

Kelibia is a coastal city in north-eastern Tunisia located at the tip of the Cap Bon peninsula, about 100 kilometers from Tunis. The citadel of the city was built at the top of a 150 m high rocky promontory which dominates the sea on the northeast flank of Cap Bon. In its oldest parts, this fortress has Roman components, but most of the work was probably erected around the sixteenth century. It subsequently underwent several refurbishments.

The building, massive and stocky, is surrounded by a powerful wall and is reinforced by square towers. Its entrance is defended by a barbican. A ramp under a fortified hall leads to the center of the building, which is surrounded by a series of spaces dating back to various periods, including, probably, a Byzantine chapel with three naves where various documents and records relating to the fort are displayed, as well as remains of military installations, an oratory and basins dating back to the Ottoman period (Néji Jalloul, 1995). At the southern corner of the bastion stands the lighthouse. From there, there is a wonderful view of the coast as far as the Italian island of Pantellaria. From the parapet walk you have a view of the city of Kelibia and the surrounding countryside. Monuments classified as national heritage on January 25, 1922.



Figure 14. Location of Kelibia fortress¹³

13

- source, Google Earth Pro.



Figure 15.View from Kelibia Fort Site¹⁴

VIII.2.Threats and Risks Analysis

- Degradation of architectural components by natural factors (wind)
- Urban Expansion which can distort the general landscape of the site, especially tall buildings.
- Conflicts due to the status of some lands around the fortress belonging to private owners and the necessity of managing archaeological remains in this area.

VIII.3.Recommendations

- Programming restoration projects for the historical monuments strengthening their infrastructure, valuing them, and exploiting them for tourism.
- Launching emergency surveys and excavations around the hill of the fortress and starting the acquisition of lands belonging to private owners so that a whole archaeological park can be set up.

14 - source <https://tunisie.co>

IX. Neapolis Archaeological site (Nabeul)

IX.1.Review of current state of the site

Néapolis is an archaeological site located on the coast of the town of Nabeul. It is one of the few cities to have a Greek name. It is also the oldest city after Carthage and the same texts confirm its importance during the Punic period.

The city is elevated to the rank of colony under Caesar or Augustus... The last data on the city are relative to the attestation of the bishops until 646. This economic prosperity rested mainly on the production of a condiment very appreciated by the Romans and elaborated from fish (Sternberg M., 2000).

A part of the city whose remains (about twenty hectares) were discovered in 2017 by an Italian-Tunisian archaeological mission. The first excavations carried out in 1965 allowed to identify an industrial complex of the Roman period for the manufacture of granum, as well as a residential area with houses paved with mosaics, some of which are preserved on site and others exposed in the museum of Nabeul. A program of development of the site is undertaken from 1996 to 2002 by the National Heritage Institute and the Agency for Heritage and Cultural Promotion.

An important part of the archaeological site is under water and the visible part is used as an archaeological park.



Figure 16.Location of the Neapolis Archaeological Site (Nabeul)¹⁵



Figure 17.View from the Neapolis Archaeological Site¹⁶

IX.2. Threats and Risks Analysis

- Rising sea level threatens an important part of the archaeological site and the waves attack it directly.
- The Archaeological Site is located directly near the seashore, and its altitude is between 0 and 3 meters, which contributes to the erosion of the site towards the sea.
- The site faces the problem of urban expansion, as it is in the center of an active tourist city.

IX.3.Recommendations

- Carry out underwater archaeological surveys to delimit the site and exploit it as a touristic destination.

16 - <http://www.nabeul.gov.tn/fr/neapolis-2>

X. Archaeological site ElHaouariacaves

X.1. Review of current state of the site

El Haouaria is a Tunisian city located at the north-eastern end of Cap Bon, at the entrance to the Gulf of Tunis. The caves of El Haouaria are indeed ancient quarries whose exploitation began no later than the 7th century BC. The sandstone was used for a long time for the construction of the monuments of Punic and then Roman Carthage. The way of exploitation of this quarry was quite original and rare in its technique.

These quarries were mentioned by ancient sources such as the geographer and historian Strabon or Diodorus of Sicily “1st century BC”. For more than a thousand-year slaves were assigned there extracting and cutting blocks that were found in the Coliseum of El Jem and later in the mosques. This Monument takes the form of a succession of Halls, in fact they are excavations hollowed out by a narrow opening that goes deep into the depths of the deposit, clearing a pyramid-shaped space. Today, the openings of yesteryear no longer exist, the site having been bombed by the Americans during the Second World War as a refuge for the defeated German army. Numerous lateral openings have been made and secured and arranged for access underground.

Archaeological site of the caves of El Haouaria



Figure 18.Location of the caves of El Haouaria¹⁷



Figure 19.View from El Haouaria Caves¹⁸

X.2.Threats and Risks Analysis

- The rising of the sea level threatens an important part of the archaeological site, and the waves attack it directly.
- Geological degradation, the collapse, and the crumbling of rock structures of certain caves

X.3.Recommendations

- Internal consolidation of the Caves.
- Construction of breakwaters in front of the site.

18 - source <https://www.webdo.tn>

XI. Archaeological site of the Punic City of Kerkouane and its Necropolis

XI.1. Review of current state of the site

The Punic City of Kerkouane, located at the end of Cap Bon on a cliff overlooking the sea, is an exceptional testimony to Phoenician-Punic urbanism. Contrary to what happened in Carthage, Tyre or Byblos, no Roman settlement was superimposed on the Phoenician city whose port, ramparts, residential areas, stores, workshops, streets, squares, temples, and necropolis are clearly outlined in their state of the 3rd century BC. The site of the Punic city of Kerkwan was identified in 1952. The excavations were the work of the National Institute of Archaeology and Art. The earliest known evidence at the site is thought to date from the 6th century B.C., while the remains, now visible in the field, date around the late 4th and first half of the 3rd century B.C. and are evidence of sophisticated town planning. The necropolis of Arg El Ghazouani, which is located on a rocky hill less than a kilometer from the city, also offers invaluable testimony to the Punic funerary architecture of that period; it is the best-preserved sector of the great necropolis of Kerkouane whose tombs are scattered all along the coastal hills at the end of Cap Bon (M'hamed Hassine Fantar, 2005).

The Punic city and necropolis inscribed on the UNESCO World Heritage List since November 28th, 1986, are the only examples of Punic architecture that have not been modified by later civilizations.

Punic city of Kerkouane and its necropolis



Figure 20. Location of Archaeological site of the Punic city of Kerkouane and its necropolis¹⁹



Figure 21. View from Punic City of Kerkouane and its Necropolis²⁰

XI.2. Threats and Risks Analysis

The rise of the sea level threatens an important part of the archaeological site, and the waves attack it directly.

The Archaeological Site is located directly near the seashore, and its altitude is between 0 and 3 meters, which contributes to the erosion of the site towards the sea.

XI.3. Recommendations

- Building an anti-erosion system relying on soft solutions off the coast of the archaeological site.

20 - source <https://whc.unesco.org/fr/list/332/>

XII. The Archaeological site of Hergla

XII.1. Review of current state of the site

Located 25 km north of Sousse, the area called Horrea Caelia, today Hergla was excavated in 1969 by the National Heritage Institute of Tunisia and dates to the pre-Roman period. Several elements are composing the site, but the most visible and relevant today is the one showing Horrea, storage building and typical roman granaries still under excavations yet.

The archaeological site is open to visitors. The archaeological remains are in an acceptable state of conservation.



Figure 22. Location of the Hergla Archaeological Site²¹



Figure 23. View from Hergla Archaeological Site

²¹ - source, Google Earth Pro.

XII.2.Threats and Risks Analysis

The rise of the sea level threatens an important part of the archaeological site, and the waves attack it directly.

The Archaeological Site is located directly near the seashore, and its altitude is between 0 and 2 meters, which contributes to the erosion of the site towards the sea.

The site faces the problem of urban expansion, as it is in the center of an active tourist town which has made it besieged by new constructions.

XII.3.Recommendations

- Renovation and reinforcement of the protective fence to resist erosion and protect the site.
- Developing and building solutions relying on soft components to stop the erosion of the shoreline of the site.

XIII. Archaeological site Hergla Warehouse (HORREACAEAIA)

XIII.1. Review of current state of the site

The warehouses partially uncovered in 1969 in Hergla, the ancient Horrea Caelia, have been the subject of a four-year research program since 2010 supported by the ANR “Warehouses and storage places of the ancient Greco-Roman world”, the National Heritage Institute and the Ministry of Foreign Affairs.

The building, rectangular in plan, consists of four wings arranged around a large courtyard. Most of the space was intended for storage, but two sectors were reserved, one for management and commercial activities, the other for religious and associative life. The stored goods were to be made up of both locally produced and imported goods. The date of construction has not yet been determined, but it seems that the building suffered rapid and severe damage that led to its abandonment before the middle of the third century (Ghalia *et al.* 2011).

Archaeological Site Hergla Warehouse (Horrea Caelia)



Figure 24.Location of the Archaeological Site Hergla Warehouse (Horrea Caelia)²²

Dating from Roman times, the archaeological site is a warehouse for export products across the Mediterranean Sea, consisting of a set of rooms surrounding a rectangular square.



Figure 25.View from Hergla Warehouse²³

XIII.2.Threats and Risks Analysis

- The site faces the problem of urban expansion, as it is in the center of an active tourist town which has made it besieged by new constructions.
- The archaeological site is located on the road to the beach, making it a passage for citizens to cross, damaging the monument, intentionally or unintentionally.
- The site is directly exposed to natural factors.

XIII.3.Recommendations

- Protect the site and rehabilitate it by strengthening its infrastructure, valuing it and exploiting it for tourism.
- Restoring the site and building a protective fence.

XIV. Archaeological site of Chat Mariem (THEMETRA)

XIV.1. Review of current state of the site

Themetra (Chott Mariem in Tunisia), an ancient city and town located in the northern suburbs of Sousse. This site is a private property. Mosaics have been found and they are exhibited in the museums of Sousse and Bardo, currently a house is built on the site and the rest is used as a garden. It is a major site as its mosaics changed our knowledge on the typology of Roman boats and the shipbuilding at that time. Themetra gave as an accurate realistic catalogue of use of boats at that time.

Archaeological Site Chott Mariem

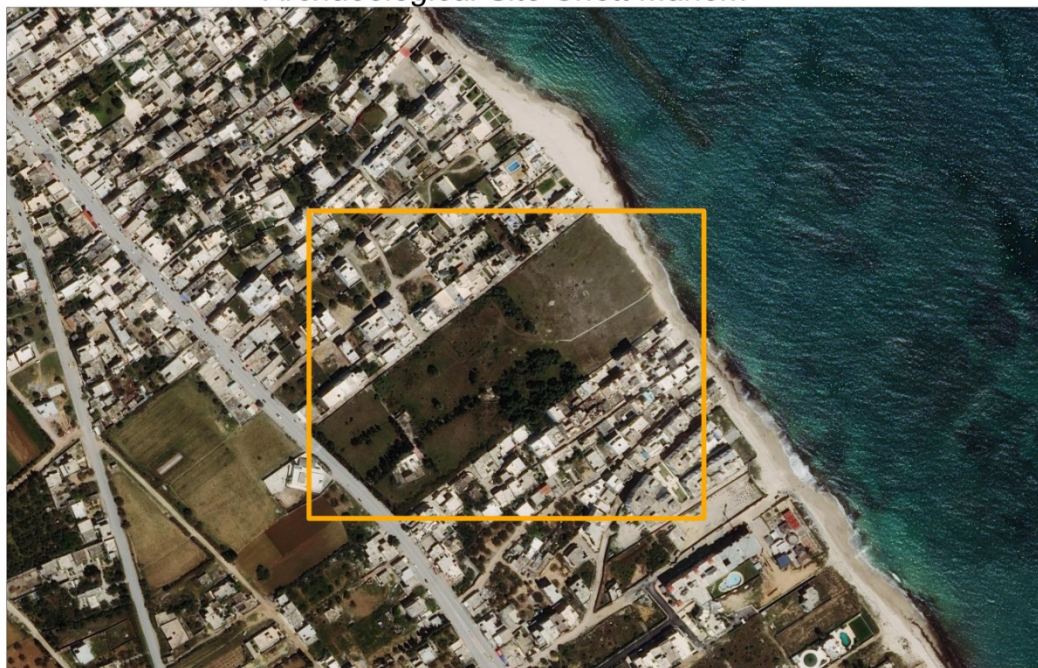


Figure 26. Location of the Archaeological Site Chat Mariem (Themetra)²⁴

XIV.2. Threats and Risks Analysis

- The site faces the problem of urban expansion, as it is in the center of an active tourist city.
- Ownership issues.
- Dense plants and trees can damage monuments.
- Drift of the water towards the sea that damages the site.



XIV.3.Recommendations

- Support the marine side of the site and build breakwaters. Enhance the protection of the site from the seaside with soft solutions respecting the site and its skills.
- The purchase of the site by the Ministry of Cultural Affairs
- Enhance the communication on the site of Themetra to international level.

XV. Medina of Sousse

XV.1. Review of current state of the site

Located on the Tunisian Sahel, the Medina of Sousse constitutes a homogeneous architectural ensemble that reflects the Arab-Muslim urbanism applied to a coastal city exposed throughout its history to piracy and dangers coming from the sea. It constitutes, with the Medina of Monastir, the only prototype that has come down to us of the coastal military architecture of the first centuries of Islam. Several monuments in the medina bear witness to this robust, ascetic, and imposing architecture, including the Ribat, the Great Mosque, the Bou Ftata Mosque, the Kasbah and the ramparts. The Ribat, both a strong and religious building, is an eminent example of this type of construction. The Medina is also made up of juxtaposed dwellings divided into districts separated by winding streets and narrow cul-de-sacs, a typology that is disappearing and threatened by modern life and the evolution of architectural techniques (Ben Said *et al.* 1985). It also contains a group of unique monuments dating from the Aghlabid and Fatimid periods, which allow us to follow the evolution of Islamic art in its early period. The medina of Sousse, historical heart of Sousse, registered since December 9, 1988, in the world heritage of the UNESCO.

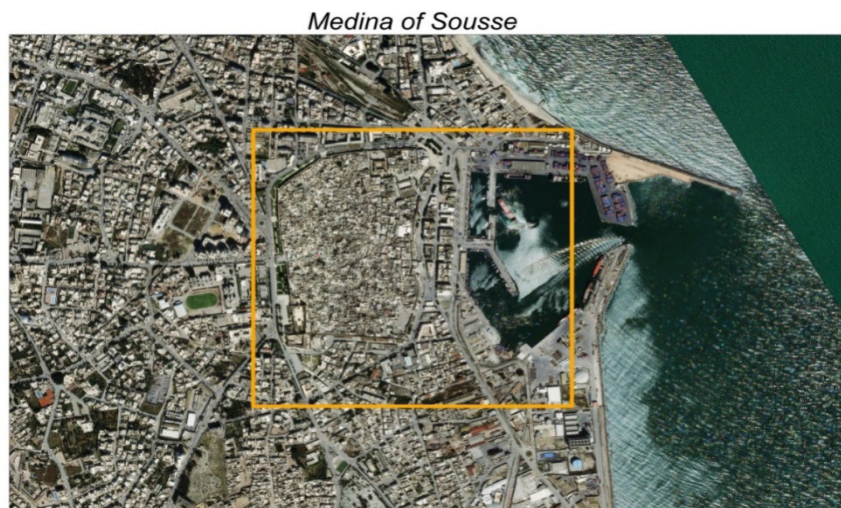


Figure 27. Location of the Medina of Sousse²⁵

25

- source, Google Earth Pro.



Figure 28. View from the Medina of Sousse²⁶

XV.2. Threats and Risks Analysis

- The Medina of Sousse faces the problem of urban expansion, as it is in the center of an active tourist city; especially with the lack of land for construction, which prompted residents to construct tall buildings that distorted the aesthetic side of the Medina.
- Illegal buildings spoil the appearance of the ancient city.

XV.3. Recommendations

- Preparing a protection strategy for the city of Sousse.
- Scheduling restoration projects for historical monuments strengthening its infrastructure, valuing it, and exploiting it for tourism.
- Dealing with traffic pollution fact corroding external walls of the Medina.

XVI. Archaeological site Djaziret L'Ghdamsi

XVI.1. Review of current state of the site

El Ghedamsi Island has remains of a prehistoric village. Many caves have been dug at the foot of the wild cliff overlooking the sea; its caves offer refuge to a rich population of birds including doves. Many archaeological sites have been discovered on the island; traces of its Punic, Roman, and Arab past can be found all over the island, as well as the remains of the tuna boat²⁷. In the southern side of the site, visitors can admire the remains of stone carriers and the traces of extracted ashlar blocks.

Archaeological Site Djaziret L'Ghdamsi

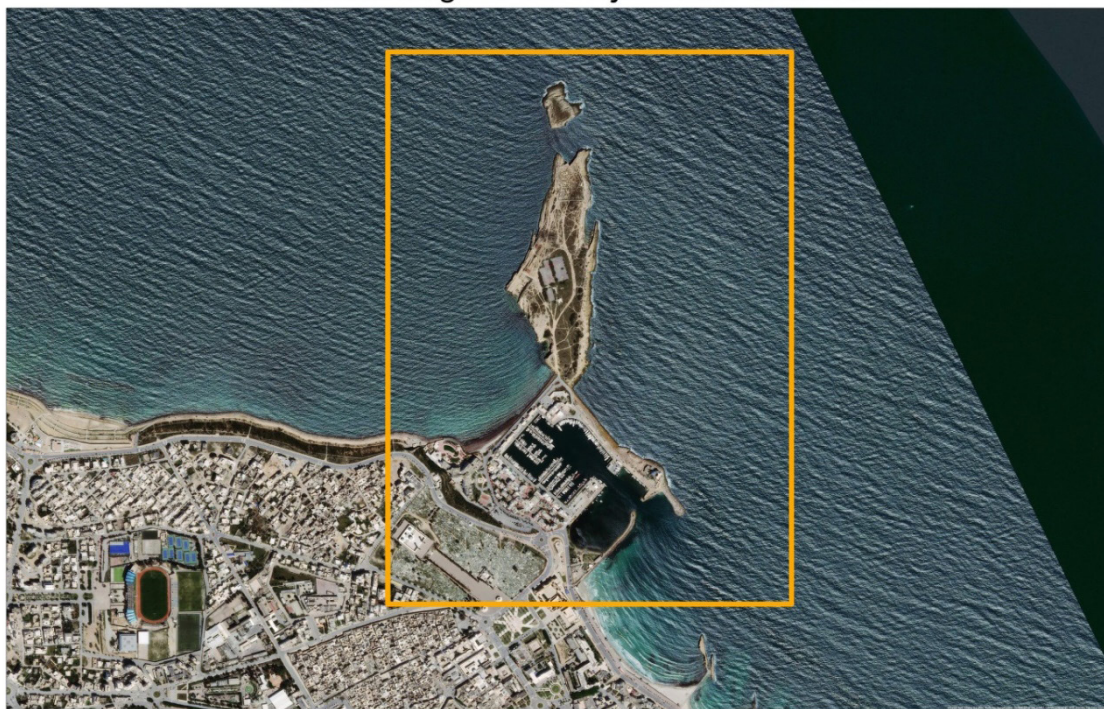


Figure 29. Location of the Archaeological Site Djaziret L'Ghdamsi²⁸

²⁷ - <http://www.mawsouaa.tn/wiki>

²⁸ - source, Google Earth Pro.



Figure 30. View from the Archaeological Site Djaziret L'Ghdamsi²⁹

XVI.2. Threats and Risks Analysis

- Dense plants and trees can damage monuments.
- The site is directly exposed to natural factors (winds, waves, sea storms).
- Waves attack the site directly and destroy many parts.

XVI.3. Recommendations

- Managing the Marine erosion with new soft solutions

XVII. Lamta archaeological site

XVII.1. Review of current state of the site

The history of the city dates to antiquity when it was named Leptis Minor to distinguish it from Leptis Magna located in Tripolitania. The site covers a large area. Part of it is in the olive forests and part of it is on the seacoast. At the site, visitors can distinguish several monuments from antiquity through the Islamic period, including remains on the shore where the site museum was built³⁰. Mainly the remains on the intertidal area are related to the harbor's complex of the Roman city (Gadhoun, 2010).

Archaeological Site Lamta (Lepti Minus)



Figure 31. Location of the Lamta Archaeological Site (Lepti Minus)³¹

30 - source Institut National du Patrimoine

31 - source, Google Earth Pro.



Figure 32. View from Lamta Ribat a major element of the Archaeological Site³²

XVII.2. Threats and Risks Analysis

- Urban Expansion due to the failure to update the urban development example of the city.
- Agricultural expansion: A significant part of the site is on private properties that are being used as agricultural estates.
- Property problems.

XVII.3. Recommendations

- Working on cleaning the whole area from waste and rubbish thrown on the beach and on remains.

32 - <http://www.commune-lamta.gov.tn>

XVIII. The Archaeological site of Bekalta

XVIII.1. Review of current state of the site

Thapsus was established on Ras ed-Dimas, an easily defended promontory on Tunisia's Mediterranean coast. Thapsus was founded by the Phoenicians. It served as a waypoint on the trade routes between the Strait of Gibraltar and Phoenicia and as a market for the inland products of the area. Diodorus Siculus wrote that Agathocles of Syracuse conquered the city. During his civil war, Julius Caesar defeated Metellus Scipio and the Numidian king Juba I at the costly Battle of Thapsus in 46 BC. Thapsus subsequently became a Roman colony in the province of Byzacena. The town's enormous mole may have been begun by the local emperors Gordian I, II and III, but their reigns were too brief to have finished the work. The construction may have been abandoned halfway. Thapsus was never known as a world-class port, especially after the collapse of Thysdrus in the 3rd century.



Figure 33. Location of the archaeological site of Bekalta³³



Figure 34. The Archaeological site of Bekalta³⁴

XVIII.2. Threats and Risks Analysis

- The archaeological site is exposed directly to sea winds and other natural factors that contribute to its degradation.
- The Archaeological Site is located directly near the seashore, and its altitude is between 0 and 2 meters, which contributes to the erosion of the site towards the sea.
- The site faces the problem of urban expansion, as it is in the center of an active tourist city what made it besieged new buildings.
- Illegal buildings spoil the appearance of the ancient city.

XVIII.3. Recommendations

- Building an anti-erosion system relying on soft solutions off the coast of the archaeological site.
- Development of a protection and management strategy for the site.

XIX. Medina of Mahdia

XIX.1 . Review of current state of the site

Mahdia is a Tunisian coastal city located 200 kilometers south of the capital Tunis, capital of the governorate of the same name. The city has some monuments and sites of interest. The Skifa Kahla or Bab Zouila, an important fortified gate dating back to the beginning of the 10th century, erected between 916 and 921 then restored in the 16th century, it is still one of the few access points to the historic center of the city and one of the few remnants of the ancient ramparts. Bordj El Kbir, a fortress with a vaulted and curved passage leading to an imposing courtyard dominating since 1595, the tip of Cap Africa. The great mosque, founded in 916 by the Shiite Ubayd Allah al-Mahdi, has the particularity of being devoid of a minaret. It underwent several modifications and renovations and was finally rebuilt between 1961 and 1965 according to the plans of the 10th century. The Haj Mustapha Hamza Mosque, built in 1772 and restored during the 20th century, is a fine example of religious architecture in the Ottoman period. Mahdia is also known for its Marine cemetery located on the seafront at the end of the peninsula (Jalloul and Khéchine, 2003).

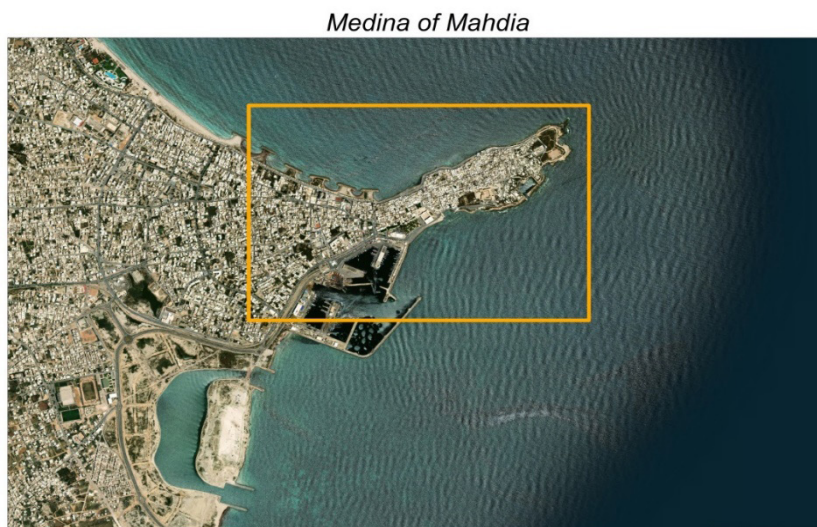


Figure 35.Location of the Medina of Mahdia³⁵



Figure 36. A restored part of the Fatimid Rampart- Mahdia³⁶

XIX.2.Threats and Risks Analysis

- Mahdia faces the problem of urban expansion, as it is in the center of an active tourist city; especially with the lack of land for construction, which prompted residents to construct tall buildings that distorted the aesthetic side.
- Sea level rise and the waves attack the site directly.
- Property problems.
- The city is directly exposed to natural factors.

XIX.3.Recommendations

- Building breakwaters in front of the city.
- Preparing a protection and management strategy for the Medina of Mahdia.

XX. Salakta Archaeological site (SULLECTHUM)

XX.1. Review of current state of the site

Salakta is a village on the Tunisian Sahel located five kilometers from KsourEssef. Attached to the delegation of KsourEssef in the governorate of Mahdia, Salakta is one of the oldest historical sites in the country. It includes a small museum set up within the ancient site. It is in Salakta that one of the principal mosaics of the national museum of Bardo, representing an African lion, is discovered in 1958. In Roman times, Salakta was an important commercial port under the name of Syllectum or Sullectum. One of the offices in the Piazza dei Corporati in Ostia is named after the naviculars of Syllectum and oil amphorae with the original mark A SYLL (translated as “from Syllectum”) have been found in Ostia and Salakta, archaeological evidence of an active oil trade between Salakta and Rome. The village was a privileged place for the Byzantines who used it as a strategic point for their conquests. During the Second World War, the French established a military base in Salakta while the Germans created a defense base there. The city is not only protected by the urban development plan.



Figure 37. Location of the Salakta Archaeological Site (Sullectum)³⁷

37

- source, Google Earth Pro.



Figure 38.View from Salakta Archaeological Site³⁸

XX.2.Threats and Risks Analysis

- Urban Expansion Which distorts the aesthetic of the site and destroys the underground monuments.
- Sea level rise as a result, significant parts of the site have been submerged under water.
- Property problems most of the site is private property.

XX.3.Recommendations

- Building breakwaters in front of the city.
- Preparing a strategy for the protection and management of the Sullecthum site.

XXI. Chebba Site (CAPUT VADA)

XXI.1. Review of current state of the site

Chebba is a coastal town in the Tunisian Sahel located about sixty kilometers north of Sfax and about thirty kilometers south of Mahdia. Chebba knows a multitude of invasions during its history: Phoenicians, Romans, Vandals, Byzantines then Arabs. In Roman times, it was known as Caput Vada (“starting point”) because of its geostrategic location. The city was then specialized in the olive oil trade. The approximately 3,600 feet of olive trees that still exist there, some of which are even thousands of years old, belonged mainly to private owners (225,000 feet grow there nowadays). The ruins of their homes are in the middle of the olive fields. Other ruins abound around the city including public cistern vaults and numerous private cisterns.

Monuments classified as national heritage on March 22nd, 1922.

Chebba Site (Caput Vada)



Figure 39. Location of Chebba Site (Caput Vada)³⁹

XXI.2. Threats and Risks Analysis

- Urban Expansion Which distorts the aesthetic of the site and destroys the underground monuments.
- The sea level rise destroys parts of the site.
- The waves attack the site directly.

XXI.3.Recommendations

- Continuing the city's coastal protection project, especially after its successful results in coastal preservation.

XXII. Medina of SFAX

XXII.1. Review of current state of the site

Sfax, ancient Roman Taparura, was rebuilt by the Aghlabides in the ninth century from the materials of the Roman city located about three kilometers away. They built the ramparts that have given to the medina its current configuration.

The city had to resist the Hilalians who came from Egypt in 1057 and, from 1095 to 1099; it was a small independent emirate. It passes, like most of the coastal cities, under the domination of the Norman king Roger II of Sicily in 1148, before being reintegrated into the Moslem sphere by the Almohades of Abd al-Mumin in 1159; this follows three years of a revolt started by Omar, with the massacre of the Christians of the city on February 25th, 1156. Sfax experienced the insurrection led by Ali Ben Ghedhahem in 1864 and that of 1881 to refuse the French protectorate. The French troops then bombarded it to come to an end. During the Second World War, it was also bombed by the Allies during the Tunisian campaign when it was occupied by Axis troops in 1942-1943.

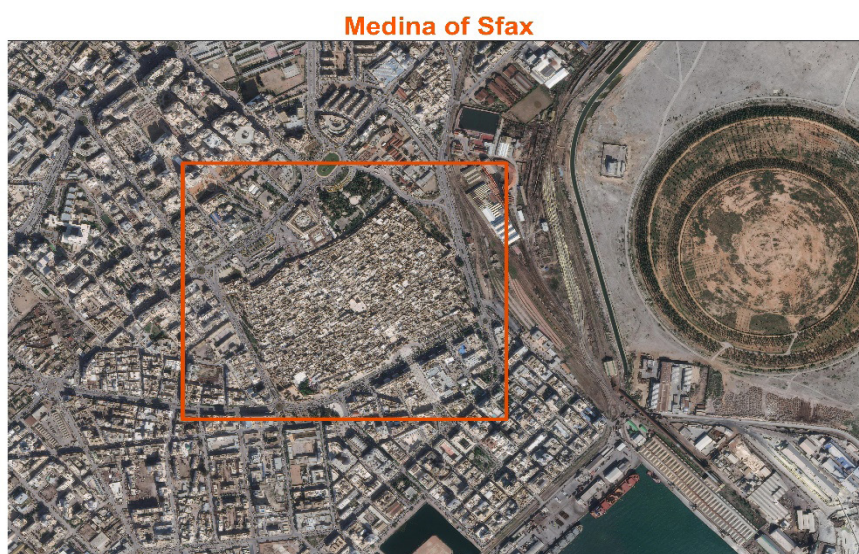


Figure 40. Location of the Medina of Sfax⁴¹

The central core of the agglomeration is formed by a medina surrounded by ramparts and a modern city, born under the French protectorate of Tunisia, and including the town hall and the station.

40 - Zaher Kammoun, « La médina de Sfax » on zaherkammoun.com

41 - source, Google Earth Pro.



Figure 41.View from Medina of Sfax⁴²

XXII.2.Threats and Risks Analysis

- The site faces the problem of urban expansion, as it is in the center of an active tourist city, especially with the lack of land for construction, which prompted residents to construct tall buildings that distorted the aesthetic side.
- Illegal buildings spoil the appearance of the ancient city.

XXII.3.Recommendations

- Prepare a protection strategy for the city of Sfax.
- Scheduling restoration projects for historical monuments to value the city.

XXIII. The Medina of GABES

XXIII.1.Review of current state of the site

Gabes is a city in the south-east of Tunisia. It is the biggest city of the Tunisian South after Sfax. Gabes has the particularity to be at the same time an oasis and a seaport. The origin of the name of Gabes makes us conclude that the city was founded by the Berbers well before the arrival of the Phoenicians who regrouped one of its agglomerations in commercial counter. The city remains Carthaginian until the first century BC and the Second Punic War then becomes a Roman colony: Tacapae. The oasis then becomes a flourishing commercial center attached to Tripolitania whose Pliny celebrates with emphasis the fecundity of the soil. The city is still very prosperous under the Byzantine rule.

Being on an important communication route, it became more important with the arrival of the Muslims in the last centuries. It resisted the first invasion, before opening its doors to the Arabs. Under the Fatimids, Gabes was the seat of a vassal kingdom ruled by a Katama family called the Loukman. The city, already prosperous under the Aghlabids and the Fatimids, seems to reach its peak under the Zirids before weakening permanently thereafter. The arrival of the Ottomans in 1574 does not change the position of Gabes in the trans-Saharan trade which products were exported from its port, which remained nevertheless peripheral compared to Tripoli which attracted much more traffic. In the 17th century, the city was rebuilt for reasons still unknown and took its current configuration with the establishment of various modest and defenseless villages. Few traces remain of the ancient city today⁴³.

Medina of Gabes



Figure 42. Location of the Medina of Gabes⁴⁴

⁴³ - <https://doi.org/10.4000/encyclopedieberbere.1977>

⁴⁴ - source, Google Earth Pro.



Figure 43.View of the Great Mosque of Gabes⁴⁵

XXIII.2.Threats and Risks Analysis

- The city is facing the problem of urban expansion especially with the lack of land for construction, which prompted residents to construct tall buildings that distorted the aesthetic side.
- Illegal buildings that spoil the appearance of the ancient city.

XXIII.3.Recommendations

- Develop a protection strategy for the city of Gabes.

XXIV. Djerba Island

XXIV.1. Review of current state of the site

Djerba is an island in the Mediterranean Sea with an area of 514 km² (25 by 20 kilometers and a coastline of 150 kilometers) and located at the east of the eastern coast of Tunisia. The largest island of the North African coast, located south-east of the Gulf of Gabes, which it borders by its eastern and northern coasts, Djerba closes the Gulf of Boughrara to the south (Ben Yagoub S., 1986).

Formerly called Gerbi or Zerbi, the island would have been crossed by Ulysses. The Carthaginians founded several trading posts there; the Romans built several cities and developed agriculture and port trade. Passed successively under Vandal, Byzantine, Arab, Ottoman and then French domination, Djerba has become a popular tourist destination since the 1960s. It remains marked at the same time by the persistence of one of the last Tunisian Berber talks, the Tamazight of Djerba, the adhesion to Ibadism of a part of its Muslim population and the presence of an important Jewish community whose tradition dates back to the destruction of the Temple of Solomon by Emperor Nebuchadnezzar II in 586 BC. The island is connected to the mainland, to the southwest by a ferry that leads from Ajim to Jorf and to the southeast by a seven-kilometer long road, the first construction of which dates back to the end of the third century BC, between the locality of El Kantara and the peninsula of Zarziss (Kamel Tmarzizet, 1997).

On February 17th, 2012, the Tunisian government proposed Djerba for future inclusion on the UNESCO World Heritage List.

Island of Djerba



Figure 44. Location of the Island of Djerba (33°48'25.74"N/10°52'48.20"E)⁴⁶



Figure 45.View from Djerba Island⁴⁷

XXIV.2.Threats and Risks Analysis

- Urban Expansion as the island attracted many new residents due to the nature of its tourism activity, as many new homes were built that did not conform to the traditional style.
- Rise in sea level which threatens all the shores of the island to drown under water.

XXIV.3.Recommendations

- Accelerate national and international legal protection measures for the protection of the island.

⁴⁷ - <https://zaherkammoun.com/gallery/borj-ghazi-mostafa>

XXV. BouchraraGightis Archaeological site

XXV.1. Review of current state of the site

This ancient site is in the southeast of the country, on the edge of the Gulf of Boughrara which forms, with the complicity of the island of Djerba, a true inland sea favorable to fishing, but also to exchanges with the rest of the Mediterranean. Maritime counter, therefore, as evidenced by the remains of port facilities now remote from the shore, and this, since the earliest antiquity, as evidenced by the presence of Punic necropolises to the north and north-west of the city, but also an important road junction linking the hinterland to the coast and the south to the depths of the Saharan domain. This explains the extent of the site, surprising at the borders of the desert, as well as the sumptuousness of its many monuments, both sacred and profane. According to archaeologists, the real development of the city is located at the end of the 1st century, reaching its peak in the 2nd century and continues until the 4th century: a remarkable duration. A sustained campaign of maintenance and restoration carried out in recent years has enabled the site to be cleared and its various components to be enhanced: capitol, forum, sacred spaces, market, residential areas, etc. The site has been restored to its former glory (Drine andGigthi, 2008).

The archaeological site is open to visitors. Inside there are the headquarters of the National Heritage Institute and the headquarters of the Agency for Heritage and Cultural Promotion. The archaeological remains are in an average state of conservation.

Archaeological Site Boughrara Gightis



Figure 46. Location of the Boughrara Gightis Archaeological Site⁴⁸

XXV.2.Threats and Risks Analysis

- The site is directly exposed to natural factors (Winds, waves, sea storms).
- The site is gradually silting up, which visitors can notice with port structures completely buried under the sediments.

XXV.3.Recommendations

- Restoring the existing monuments, strengthening their infrastructure, valuing them, and exploiting them for tourism.

XXVI. Conclusions

The growth of tourism in the Mediterranean, especially in coastal areas, and the effects of climate change will continue to affect landscapes. Tunisia, located on the Mediterranean coast of North-West Africa, is directly affected by this phenomenon, a situation that deserves more attention. This article aims to analyze and promote the co-evolution of human activities and natural ecosystems related to tourism in Tunisia. It also introduces some archaeological sites which, through the stability/erosion of soils and coasts, exert pressure on them; to formulate an effective strategy to protect and enhance them to become a touristic destination; thus, being able to compare them to the rest of the Mediterranean; and at the same time promote Blue Growth in the Mediterranean.

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