

Cultural and Natural Heritage Sites

Djerba scale, Tunisia





Co-Evolve4BG

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

Cultural and Natural heritage sites Djerba scale, Tunisia



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OVERVIEW

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REVIEW

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Abstract

It is obvious that Djerba economic development is highly dependent on the tourism sector. However, tourism development is currently facing a sharp decline due to overexploitation of the surrounding area. Hence, developing a new form of more “sustainable” tourism based on the wealth and natural heritage protection and enhancement must imperatively prevail.

Besides, the dual and mutual development process must be implemented by focusing on the deployment of natural areas , such as wetlands (Ras R’mal, Ras El Kastil, Ras El H’Mar area and the islets of El GatâyaLellaHadhria, the Sidi-Jmour-Borj-Jilij-El Gala area) as well as cultural heritage such as the archaeological sites (Meninx, Souk elGuébli, Gataya elBahrya, Gataya Gablya, Dzira, Necropolis, the archaeological site of Guellala, El Hardoub, Cheikh Yahia), the defense system (Borj Ghazi Mustapha, BorjAghir, Borj Ajim, *etc.*), the mosques (the mosque of Sidi Hachani, the mosque of Sidi Salem, *etc.*), and the historic center of Houmet Souk seems to be a condition for the salvation and renewal of Djerba Island Tourism.

I. Introduction

It is obvious that Djerba island economic development is highly dependent on the tourism sector even though tourism development is currently facing a sharp saturation and a decline phase. Indeed, the current tourism model, characterized by fluctuating and generally weak indicators, is running out of steam. The recorded tourism activity dynamism as a vector of economic growth remains relative. Besides, it hides significant weaknesses, inducing environmental and social damages. Moreover, the island's natural, historical, and cultural heritage, instead of constituting an asset and a vector of sustainable development, it has been often marginalized and insufficiently valued.

With hindsight, we can state that previous choices regarding the major tourism development plans implementation were inadequate, in the sense that they neglected the environmental aspect. In fact, while the Island is trying to enhance destinations' accommodation capacity strategy, Tunisian tourism market has become saturated and declined. Moreover, the coastal areas have become more and more overexploited and can no longer be considered efficient. Hence, developing a new form of more "sustainable" tourism based on wealth and natural heritage protection and enhancement has become a must.

So far, instead of being a vector of a true respectful approach towards our fragile natural heritage, the Tourism current model can be assimilated to a "predator" that would savagely consume the natural surrounding regardless of its conservation and sustainable management compromise the environment's balance within which it develops.

This statement is indeed based on the major tourist development plans for the coast during the 1960s and 1970s, where the tourist offers focused on the tourists' new consumerist aspirations and need for exceptional sites and services, increasingly distant from the simple use of nature. These tourism development plans have enabled imposing accommodation infrastructure which enhanced the island's attractiveness at the international level but resulted in strong pressure on the natural environment. Hence, taking urgent and effective measures to protect the natural environment has become imperative. Indeed, Nature must be a crucial component of the tourist offer. Consequently, tourism development must be planned with the awareness and the requirement of protecting, maintaining, enhancing the natural environment while giving a new dimension to the ecological tourism approach.

It is high time today to understand differently the relationship between tourist attractiveness and natural spaces and to see as well how tourist activity in Djerba could contribute to the natural spaces rewarding management. By grasping the importance of protecting nature and maintaining biodiversity richness, the attitude of tourism stakeholders, producers, or tourism products consumers can ultimately change and lead to improving the island's natural and landscape quality. Hence, promoting its attractiveness.

Furthermore, implementing a real strategy considering the protection of natural heritage is now a crucial condition for the island's tourism sustainable development and a shared responsibility between both public and private stakeholders.

A dual and mutual development process is highly recommended to be urgently implemented by focusing on the natural areas and the cultural heritage development. Indeed, it seems to be a condition for Djerba Tourism salvation and renewal of the Island.

II. Potentialities

II.1. Wetlands

Wetlands are often defined as transitional spaces between land and water that consist of an exceptional natural heritage due to their biological richness and natural functions. In fact, they account for the richest and most productive natural environments in the world. The ecosystem services they provide play an essential role in sustainable development and directly influence the lives of millions of people around the world. Indeed, different services are provided by these wetlands, such as flood control, water purification, groundwater recharge, coastal stabilization and protection against storms, retention, as well as sediments and nutrients export.

II.1.1. Ras R'mel

II.1.1.1. Description

Ras R'mel site consists of a long row of dunes stretching through 5 kilometers, comprising the sabkha of El Hachani, the inland sea of Ghizen-Sidi Zayed, and beaches which are an important nesting site for sea turtles. All these distinct environments have their richness and diversity of flora and fauna.

II.1.1.2. Tourist value of the site

Ras R'mel site represents an area of great value as part of the richest island landscape. Located in the extension of one of the most important Tunisian tourist areas, Ras R'mel represents a natural space that is unique in terms of recreational value.

A huge tongue of sand jutting out into the sea offers the visitor a still virgin landscape and therefore offers to the entire island, a very rewarding quality image of the natural environment. Indeed, Djerba island's coasts are mostly highly urbanized, and its beaches are largely exploited except for the North coast, where Ras R'mel constitutes a landscape natural break.

The landscape's diverse variety is undoubtedly the primary characteristic of Ras R'mel. Indeed, an area of large dunes (up to an altitude of 3m) with dense plant cover is followed by a strip of bare sand jutting out into the sea.

Located in the extension of this important tourist area, Ras R'mel attracts many visitors among whom the category of 'hotels residents' occupy the first place. Indeed, Ras R'mel represents a particularly pleasant walking area by offering breathtaking beaches and natural landscapes on its eastern façade.

II.1.1.3. Threats affecting or expected to affect the site

II.1.1.3.1. Natural factors

Sea level rise:

Currently, this sector is very vulnerable. In fact, it has been subject to fairly pronounced marine erosion as well as land degradation due to salinization.

Moreover, the sea-level rise estimated at around one meter per year contributes significantly to the coastline decline which is partially or completely submerged. For instance, the marabout of Sidi Hachani situated at the end of the spire of Ras R'mel, which was still preserved during the 1970s, has almost entirely disappeared today, resulting from the erosion of the beach and the retreat of the coastline (Oueslati, 1995).

Marine intrusions:

The low areas of the spit are regularly invaded by seawater, especially during periods of strong agitation. These marine intrusions contribute to the dislocation of the Ras R'mel dune cordon.

II.1.1.3.2. Anthropogenic factors

Sand extraction:

The beaches, sand and dunes have been subject to abuse and exploitation. Ras R'mel site was not spared, especially at the foot of the spire, where the ground is now completely leveled, and the dune field destroyed.

Overexploitation of the site during the summer, as well as the use of vehicles (4x4 type) and the uncontrolled rides on horseback, led to a settlement of the dune and a trampling damaging the fixing vegetation of these dunes. Uncontrolled withdrawals at the level of benthic resources have also been traced (the picking of small pearl oysters from the shore).

Land pollution in the area:

Land pollution in the area consists mainly of illegal disposal or abandonment of plastics (water bottles) in certain parts of the area.

II.1.2. Ras El Kastil (or Bin El Ouediane)

II.1.2.1. Description

Located in the southeast of the island, the Ras El Kastil (or Bin El Ouediane) site grouping a complex of varied environments and biocenosis, represents a particular landscape both in terms of geomorphology and Eco biological characteristics. It consists of a tongue-shaped arm of land, about 7 km long and 2 to 3 km wide, the tip of which is the result of coastal drift currents which carry sediments from the coast to the south-eastern part of the island. This formation continues towards the Zarzis peninsula by a series of islets almost parallel to the Roman road.

In its terrestrial part, the area of Ras El Kastil presents a set of wetlands flooded according to the seasons, composed of:

- Wide and thin sandy beaches, weakly represented, stretching from Aghir to El Borj.
- Active dunes forming the spit and the shorelines.
- Old dunes consolidated, plugged, and stabilized by dense plant cover.
- Bare sabkhas and chotts, characterized by sandy-silty to silty-clay facies, sometimes surrounded by rich halophilic vegetation.

These environments are characterized by great diversity and heterogeneity resulting in relatively high species richness and the presence of various biotopes favorable to several zoological groups and taxa. The area is also a wintering and feeding area for important birdlife and an appropriate place for the rest of migrating or sedentary birds' colonies. The beaches are also, in some places, an environment conducive to the laying and nesting of the *Caretta caretta* marine turtle, a highly endangered species in the Mediterranean Sea.



Figure 1. Image of Ras El Kastil

II.1.2.2. Tourist value of the site

The area is nowadays a site of significant seasonal tourist attraction for visits, tours, and hikes, thanks to the presence of:

- A large area with a flat topography, serving as a base for a station of small light-engine airplanes (U.L.M.) and sand yachts.
- Special varied landscapes with large natural spaces open as far as the eye can see and rich birdlife, reflecting the environmental values of the site.

- A Borj has a strategic position throughout the site, constituting a center of interest and a place of attraction for various reasons (archaeological visits, meeting place, stopover of the visiting circuit).
- Tracks and paths favoring circulation by various transport means (cars, cycles, pedestrians, *etc.*).
- Sandy shoals to shelter light installations and tourist reception structures (parasols, seats, wooden huts, *etc.*).

II.1.2.3. Threats affecting or expected to affect the site

All the activities carried out on the site do not obey any strategy for the sustainable use of the environmental ecosystems and are carried out without considering the fragility of the marine environment components, which has become a serious concern in the region.

The main threats to the marine environment in the Ras El Kastil area, therefore, come from current activities carried out on the site or those that are likely to be planned there. However, the threatening factors appear in the Ras El Kastil area with relatively different importance and degree of impact from other parts of the island.

II.1.2.3.1. Threats from a possible extension of coastal developments

The absence of solid constructions in the Ras El Kastil area leads us to conclude that a priori, the threats induced by the fixed developments on the environment of this site are almost non-existent. In fact, the hotel establishments, which have stopped in the south of Aghir (relatively far from the Borj representing the center of the site), do not seem to have resulted in significant modifications to the sediment balance of the whole area.

However, the few detected problems of marine erosion at the level of the last establishments constructions in the direction of Ras El Kastil (in this case the Raïs Hotel located a little further south of Aghir), encouraged the reflection on the risks resulting from the extension towards the southeast coast of the island, of tourist facilities (by urbanizations, access roads, *etc.*), which will undoubtedly constitute a serious threat to the ecological balance of the Ras El Kastil area.

II.1.2.3.2. Overexploitation of the Ras El Kastil site for recreational purposes

The Ras El Kastil site is quite popular with holidaymakers. It is sought by tourist promoters who use it for recreational purposes: tours, hikes, organization of feasts, sailing sports, and microlight. The Borj is notably used as a point of attraction.

This exploitation is currently carried out without any control or rules of attendance and use of the environment and can therefore lead to overexploitation of the area during summer. The intense unorganized traffic, with the uncontrolled circulation of cars, cycles, and pedestrians through wetlands (sabkhas, chotts, ...) can further harm the environmental ecosystem balance.

II.1.2.3.3. Overexploitation of biological resources

The Ras El Kastil site consists of a traditional fishing area in Djerba. However, the abuse of biological resources, most often done to satisfy the tourist sector, leads in the summer to the overexploitation of certain species including the small pearl oyster.

II.1.2.3.4. Solid waste and illegal dumps on the shores

This phenomenon occurs very accidentally in the Ras El Kastil area together with the over or anarchic exploitation facilitated by the multiplication of accesses. For example, especially through the refreshment stalls and restaurant activities. Hence, leading to the discharge points proliferation and the of the coastal and marine environment quality impairment of the area.

II.1.3. Ras El H'Mar area and the islets of El Gatâya

II.1.3.1. Description

The targeted area includes the point of Ras El H'Mar located to the southeast of Ajim and the two islets of El Gatâya (El Gatâya El Bahria and El Gatâya El Gueblia) located respectively to the northwest and southeast of Ajim, which represent isolated environments giving the sector a singular and exceptional ecological status.

The Ras El H'Mar site can be delimited by the Tlêl cliff to the north, the Aquaculture Station to the west, the sea to the south, and approximately PK 8 Guellala-Ajim to the east. The particularity of this environment and its ecological interest are linked to its heterogeneity and its diversity as it is composed of abiotic and biotic components. It embodies all the ecosystems that can possibly be found in the island whole territory, made up of:

- A cliff which represents the highest point of the island (Guellala water tower)
- A rugged terrain with sparse wild flora
- Olive groves
- A large and important palm grove spread over several hectares.
- A marshy area which currently constitutes a major depression that can turn into a temporary pool following the rains or possibly by supplying water from deep wells of the former cultivation area.
- A border of sabkha on sandy soil. This area is currently very threatened by deposits of clay and household refuse.
- Marshy areas that are flooded depending on the season and the amount of rain.
- An important sandy shoreline in stony places characterized by a large tidal swing zone, particularly welcoming a very abundant fauna and hosting a rich birdlife and a large concentration of shorebirds.

The islet of El Gatâya El Bahria has a relatively dense vegetation cover. The environment represents a favorable place for birds, in particular gulls, terns, pink flamingos, and particularly cormorants.

The islet of El Gatâya El Gueblia has flat terrain, with relatively consolidated soil and slightly silted at the foot of tufts vegetation. The avifauna is particularly rich and diverse, with a large colony of flamingos attached to this environment.

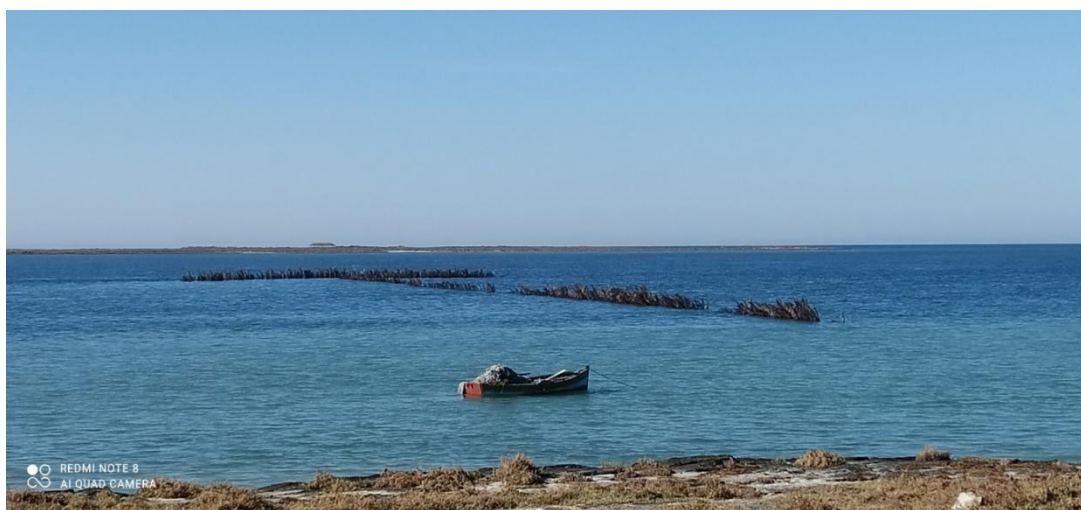


Figure 2. Ras El H'Mar area and the islets of El Gatâya

II.1.3.2. Threats affecting or expected to affect the site

The Ras El H'Mar area is subject to significant human pressure from residents (urbanization, port activity, land, and aquatic livestock activity, clandestine wastewater discharges, various uncontrolled pollution, a proliferation of discharge points, *etc.*), leading to the natural environmental aggression of an increasingly fragile coastal zone (coastal erosion, pollution of the aquatic environment, disturbance of marine ecosystems, degradation of marine facies, *etc.*). On the other hand, the two islets of El Gatâya which are uninhabited, are characterized by natural environments that are still pristine maintaining their primary virgin state, not having suffered any threats. In fact, the main threats to the marine environment in the Ras El H'Mar area and the islets of El Gatâya, come therefore from the current irresponsible activities carried out on the site or those that are likely to be planned there.

II.1.3.2.1. Threats from the Facilities

Djerba southwestern coastline area has not yet been one of the sectors covered by tourist establishments. However, urban development in the Ajim region and its surroundings shows a tendency towards the coastal parts occupation where relatively advanced constructions can be sometimes observed.

This urban progression trend together with the human irresponsible activities towards coastal areas, is likely to damage the marine environment which is suffering right now from the negative effects of such an urban development which has entailed the following effects such as:

- The natural coastal palm regression and the gradual dismantling of the bordering dunes
- The surface areas regression of schorres.
- The coastal dynamics instability has led to the marine erosion phenomena amplification and marine ecosystems unbalance. Therefore, *Cymodocea* facies can gradually disappear in shallow areas due to the trampling and burial effects.

II.1.3.2.2. Overexploitation of the site

The two islets of El Gatâya are uninhabited and have not yet been exploited. On the other hand, we see on the coast of the Ras El H'Mar site various types of exploitation (agriculture, fishing units, *etc.*), which, even though not being important today, may subsequently constitute a problem in the future. Overexploitation can be avoided through restrictions and rules regarding the frequentation and use of the natural environment.

II.1.3.2.3. Overexploitation of biological resources

The area of Ras El H'Mar and the islets of El Gatâya constitute a privileged fishing area in Djerba, that is the subject of important artisanal fishing action and houses fishing and breeding units (aquaculture installations of the JAT company, *e.g.*, AST, and of the PJ company). The biological resources exploitation through several operators, without any regulation and rationalization, leads to certain species overexploitation whose populations are increasingly threatened to decline and, ultimately, to disappear.

In addition to the overexploitation, it is worth mentioning that the presence of a large cormorant colony on the island shores and the islets (at least 10000 individuals were recorded on the islet of Jilij in 1999) which constitute a serious biotic problem in this area, represent a threat to the environment. Cormorants exert a strong predation pressure on the marine fish population since the diet of a single cormorant is about 500 g of fish per day. In fact, they prey on fish at Ajim's fish farm where they cause extensive damage. It should be noted that this population, which spends at least 4 months a year on the island and whose density increases from year to year, was never recorded before the 1970s.

II.1.3.2.4. Pollution

The marine environment of the Ras El H'Mar area and the islets of El Gatâyais are attacked by several sources of pollution whose accumulation of impacts has strongly affected the ecosystem in the area. Indeed, on the one hand, this area has suffered the effects of the pollution affecting the entire Gulf of Gabès, and on the other hand, it receives illegal discharges from residents, from aquaculture stations, from the Guellala slaughterhouse and from various other sources such as the port area of Ajim.

II.1.3.2.5. Solid waste and illegal dumps on the shores

This phenomenon is progressively amplifying along the southwest coast of Djerba subject to significant illegal dumping points proliferation, which will shortly make the area unsanitary, unless effective measures are taken.

Intensification of port activities:

The activities intensification concerns essentially the Ajim port area, where the lack of both appropriate management rules and effective maintenance could ultimately hamper its economic development.

II.1.4. LellaHadhria

II.1.4.1. Description

Lella Hadria site is made up of a land strip stretching throughout the tourist route and the sea. It covers a relatively large area of 363 ha, of which 240 ha is public maritime property. A lagoon is defined as the area which varies between 40 ha (in summer) and 150 ha (in winter), it occupies the central part and communicates with the sea only by a “Séguia” channel and a few passes located in its southern part. To the north, the site is distinguished by the presence of a lighthouse. A long dune strip, 130 m thick, on average, but up to 320 m in its widest part extending to the east of the site.

This wetland has a rich biodiversity that has an important ecological role on several levels. Indeed, it allows the regulation of hydraulic flow thanks to its storage capacity like most wetlands, but it also protects against coastal erosion thanks to its vegetation. In addition, it represents a shelter zone for certain species which live there as well as a path for migratory species and nesting area for protected species.

II.1.4.2. Threats affecting or expected to affect the site

II.1.4.2.1. Natural factors

Rise in sea level due to climate change:

Currently, this sector is vulnerable, and it is subject to fairly pronounced marine erosion in addition to the land degradation due to salinization.

Marine intrusions:

The low-lying areas are regularly invaded by seawater, especially during periods of strong agitation. These marine intrusions contribute to the dislocation of the existing dune cordon.

II.1.4.2.2. Anthropogenic factors

The greed of promoters, large and small

Spared so far from rampant urbanization that has irreversibly compromised the coastal

ecosystems along the northeastern coast of the island, the area of Lella Hadhria is in the grip of voracious lust from developers.

The human pressure of-on the site during the summer:

The use of vehicles, horse rides conducted in an anarchic manner, the massive access to the beaches.

Land pollution in the area:

The land pollution mainly involves the illegal disposal or abandonment of plastic materials (water bottles, *etc.*) especially in summer by visitors or by fishermen and in certain parts of the area.

Overexploitation of biological resources

The area of Lalla Hadria represents a privileged fishing area in Djerba. It is the subject of both significant artisanal fishing activity and several house fishing units.

II.1.4.3. Tourism value of wetlands

Wetlands (Ramsar sites and others), with their ecosystems and biodiversity, play an essential role in the global tourism experience and have much to offer to modern adventurers. (UNWTO). Nature tourism is booming, and wetlands, long poorly considered, today enjoy a certain attractiveness around the world.

In Djerba, the four wetlands are surroundings with high biodiversity, both marine and terrestrial, favorable to the observation and enjoyment of nature as well as the traditional cultures that prevail there. Thanks to their intrinsic riches, they constitute an appropriate study ground for observing the interactive processes linking heritage, nature, and tourism.

Like other wetlands in the world, and instead of continuing to sink into marginalization or anarchic and irrational exploitation, they will be able to play an aesthetic and educational, recreational role. In fact, they offer a diverse variety of activities, both recreational and educational. Hence, appreciating the breathtaking beauty of its landscapes, and the tranquility of the place. Tourists as well can go hiking, bike riding, observe nature and birds, but also it is a chance to discover the natural components and to understand the mode of the environmental natural ecosystem operation and its biological diversity.

In Djerba, the four wetlands could be the subject of green or nature tourism, commonly known as “ecotourism” which is a very popular concept around the world. In fact, sources from the World Tourism Organization announced that around 1.6 billion tourists in 2020, not counting domestic tourists, nor recreational day trips without a night there, have visited wetlands.

II.1.5. Proposed measures for the protection and management of wetlands

The sensitive wetlands of Ras R'mel, Bin El Ouidiane, Ras El H'Mar and the islets of El Gatâya and Lella Hadhria, which are sheltering rich ecosystems variety are completely uninhabited and they are still safe from the human invasion of their permanent irresponsible behavior and their wild urban development. Unlike the coastal areas of the island, this area is exempt from any degradation. In fact, these sites are self-protected thanks to the flooding nature of their lands that are accessible only in dry periods. However, these environments are constantly under significant anthropogenic pressure, and they are always under attack by several increasingly threatening sources of pollution. Hence, setting urgent rehabilitation and appropriate management plans are imperative to protect the area's natural resources, as well as to avoid anarchic exploitation and safeguard the ecological, cultural, and economic interests of the region.

It is thus, beneficial in many respects and highly recommended to promote a model of tourism in these highly attractive areas that highlights a sustainable development respectful of the environment and of the island's specific features through the implementation of several measures or actions such as the following:

- 1- Address the lack of knowledge of the environment's natural components, biological diversity, and ecosystem's mode of operation through a real environmental education as an effective instrument of reflection and awareness concerning wetland issues.
- 2- Establish an action plan and realistic management rules involving all concerned parties. The latter should be developed within the framework of a sustainable development strategy allowing the protection of natural resources and the rationalization of their possible exploitation. In fact, the threats weighing on these sites derive from tourism, which represents the main economic sector in the region. Hence, encouraging a growing demand for projects. It is also necessary to know how to converge the two objectives of attaining economic growth through the tourist sector while ensuring environmental preservation through identifying, evaluating, and defining the types of activities, operations, and possible installations in these sites.
- 3- Implement the necessary structures, such as a coastal conservatory or an information center to control and prohibit possible exploitation and illegal environment enthrone, inside or nearby the areas. It seems also crucial to provide the necessary resources to help impose compliance with the development plan and its regulations.
- 4- Promote awareness of the need to preserve remarkable natural and cultural spaces and limit the effects of the pressure induced by residential, or tourist populations flows. This can be done only by controlling, regulating, limiting access to visitors, implementing private parking, roads, and allocating the appropriate resources for this purpose.
- 5- Require a detailed impact study for any development in the area surrounding the site to be protected by submitting it to specialists before sending it for administrative approval. Specific reference terms must be drawn up in this sense.

6- Prohibit frequentation of the beach sectors constituting the *Caretta caretta* marine turtle spawning grounds, at least during the spawning period (in the case of *Ras R'mel*).

7- Establish visit circuits and stopovers supported by discoveries and particular observations (ornithological tourism for example): the hiking trails are the very example of the technical and social success of developments that have been able to respond to consumer-hiker expectations for a symbiosis between nature and leisure. In fact, tourists tend to favor areas of high-quality landscape, which are also often areas of high ecological value which are clearly represented through the wetlands.

8- Train local guides and tourist agents to be able to explain the fundamental characteristics of wetland natural sites and to make the conservation measures understood in simple terms to their visitors and tourists that they are responsible for.

9- Develop new charters around these natural spaces to guarantee behavior that respects the environment, the preservation of flora and fauna as well as the built heritage.

II.2. The Sidi-Jmour-Borj-Jilij-El Gala area

II.2.1. Description

It occupies the island Northwestern part which is made up of low rocky coasts punctuated with coves of fine sand, where fishermen anchor their small boats.

The shallows characterizing the area, hardly exceeding two meters at high tide, have favored the practice of the fixed fishery known as “Zraieb”, or “Cherfiya” in kerkennah (recently listed on the Intangible World Heritage List).

The fixed fishery is an autonomous fishing device, which consists of blocking the sea currents employing a hedge of palm branches “pull-back wall”, planted in the mud, perpendicular to the coast. Thanks to this draw-down wall, the fish, carried along by the current, are directed towards the two corridors arranged on both sides and which, inevitably, lead them into the capture chambers. These chambers have three openings through which the light passes, obstructed by traps, or “Drina”. Once the fish enters the “Drina”, it can only escape, and is then picked up by the fisherman who comes with the boat to raise the trap using a pole and replacing it with another for the next fishing trips.

II.2.2. Tourist value of the area

This area that has remained untouched and virgin, offers the visitor the opportunity to be more in touch with Nature and closer to the human community that populates it. In fact, most fishermen earn their living essentially from their hard work in the sea. The ancestral technique of traditional fishing practices of fixed fisheries, or what is called “Zraieb”, could be highly attractive for visitors to discover conventional fishing ways. Besides, admiring the landscape with its spontaneity, and having the chance to follow the fisherman during the whole process of fishing, from the lifting of the net to the recovery of the fish caught, is a unique and memorable spectacle.



Figure 3. Image of The Sidi-Jmour-Borj-Jilij-El Gala area

II.2.3. Threats affecting this site

This area remains pristine and intact. Fishing is the major activity and the site's mainspring, illustrated by the existence of more than a dozen fixed fisheries easily visible from the mainland, which makes it famous. However, numerous constraints threaten the area and the sustainability of this ancestral fishing practice. These are illustrated below:

- The decrease in the enthusiasm of young people for the fishing sector.
- The abandonment of this ancestral traditional fishing process.
- The illegal trawl fishing that threatens Posidonia meadows and fish stocks being in inexorable decline, leading to a decline in the quality and quantity of catches and therefore of income.
- The intrusion of other fishing techniques not adapted to this marine environment and often prohibited by the regulations in force (Kiss) and the use of fishing gear that does not respect the exploitable part of the biological stock (small mesh).
- The rapid degradation of the flora and fauna of this marine environment.
- The loss of traditional knowledge and know-how well adapted to the ecological conditions of this marine environment.
- The substitution of traps made as byproducts of the date palm by synthetic mesh traps and ferrous materials.

II.2.4. Recommendations

- Action plans to safeguard this biological richness and these techniques that have proven their effectiveness and the good management of these resources in time and space.
- Awareness raising among the inhabitants through popularization programs on the merits of this ancestral fishing technique.
- Awareness raising among residents and tourist providers (travel agents, guides, trekkers, hikers, etc.) about the landscapes, activities linked to the area, related know-how, etc.
- Incentives provisions for initiatives to rehabilitate and enhance fixed fisheries, or “Zraieb”.

II.3. The cultural landscape of Menzels

II.3.1. Description

Cultural landscapes are defined as “combined works of nature and man, and they express a long and intimate interaction and the relationship between man and his natural environment, thus reconciling natural and cultural characteristics in the same category.

“The landscape is recognized as an asset to be preserved and no longer as the environment of a monument. It is therefore considered as resulting from the interaction between nature and culture. The addition of the term “cultural” aims to recognize the intangible values of the landscape against the risks of fragmentation and possibly loss of meaning linked to territorial transformations. In Djerba, an exceptional cultural landscape of unique aesthetic richness has been created, made up of a series of places that the inhabitants have shaped according to their tastes.

In fact, the island territory appears in the form of flat land covered with vegetation mainly made up of palm trees and olive trees. In fact, this land has scattered white isolated volumes standing in a rural landscape where the mesh defines a very complex parcel division. It is a unique urban model that is developed throughout the years, shaping the territory, according to an original and ingenious division that organizes the space into a subdivision of “Houma” (neighborhoods, zones).

Each “Houma” is made up of a series of Menzel, plots of 2 to 4 hectares which form the basic unit of land use in Djerba, and which establish areas of daily life and activities. The house called “Houch” that symbolizes the heart of the family estate, is one among the many other elements on which depend the complex structure of the “Menzel”. Such a structure includes the threshing floor “Rayeh”, the storage and storage rooms as well as the house reserved for guests called MakhzenEdhiaf, *etc.* All these units are structured according to the recurring grid of an infinite density and hierarchical network of tracks and paths.

Unlike the mosques that prevail elsewhere in the Arab-Muslim Medinas, where religious buildings merge into the density of the urban fabric, numerous spatially isolated mosques of great purity are ingeniously distributed throughout the entire island space and have the particularity of being autonomous elements. Their sober and stripped-down design expresses the philosophical and religious vision of the Ibadi rite, long dominant on the island.

The traditional territory planning of the island (in Temlel, Mahboubine, in Khazroune, Sédghiène, and Guéchiine) stands both for the adaptation of the locals to their environment and for their interaction with it. Hence, allowing them to tame the vagaries of the climate, and the difficult nature to adapt easily and as a result to be self-sufficient.



Figure 4. Djerba Island landscape

II.3.2. Tourist value of the site

The attractiveness of these island territories carrying this cultural landscape, its authenticity and exceptionality, is a proof for its candidacy for recognition as a potential tourist destination on a global scale. In a context of growing competition from tourist destinations, the symbolic repercussions, in terms of images and consolidation of the territorial identity are major and obvious.

This ignored and marginalized heritage landscape could prove to be a definite contribution to tourist activity. In fact, it reflects a living culture authenticity of an ancestral and specific tradition. Therefore, it has become able to attract the desire and motivation of the traveler or the tourist to meet the inhabitants and to see through the symbolic, identity and aesthetic values of these heritage natural spaces. Consequently, tourism represents an economic spring for this cultural landscape and a motor of its heritage development. Both tourism and heritage will be able to interact with co-construct and enhance these places of memory.



Figure 5. Tourist value of the site

II.3.3. Threats affecting or expected to affect sites

Being the result of a long harmonious interaction between man and nature, the cultural landscape of Djerba is seriously affected and its sustainability seriously compromised, under the effect of several factors including:

- The successive divisions induced by inheritance worsen land tenure problems.
- The conversion of fragile agricultural and natural areas into hotel areas, imposed by the development plan for the tourist area and its extension.
- The destruction the tabias due to the modernization of branched paths and the construction of roads, which has aggravated soil erosion and flooding risks.
- The abandonment of agricultural activity practiced in Menzels gradually deserted by their occupants.
- The drying up, if not the salinization of the water resources.

II.3.4. Recommendations

- Provide incentives for initiatives to rehabilitate and enhance Menzels with all their outbuildings, the Houch and its production area.
- Protect the Menzels against silting up and fight against the salinization of water resources.
- Prohibit the destruction of tabias and encourage their repair and maintenance.

- Ensure the tourism and heritage training of guides and hotel staff.
- Involve certain tourism stakeholders in the committees for the protection and management of these sites.
- Raise awareness among residents and tourism providers (travel agents, trekkers, hikers, etc.) about the landscapes, and the elements that make up the identity of Djerba (built heritage, activities linked to the island, local know-how, etc.)
- Make Djerba a sustainable tourism destination, by placing the inhabitants at the heart of tourism development, as accommodation providers, stakeholders in their environment, facilitators of the offer, but also clients and ambassadors of their territory.
- Affirm the approach of excellence of the major heritage sites of Djerba through the mobilization of a network of the main heritage sites which are the basis of the reputation of the island.

III. Cultural sites

III.1. Description of the archaeological sites and the historic monuments

III.1.1. Archaeological sites

Meninx

With an area of over 130 ha Meninx can be considered one of the largest sites in Tunisia. Thanks to field research carried out as part of the Tunisian American project (1996-2000) and the Tunisian-German one (2015-2018) there has been a better strategy for the ancient city urban development.

Its forum, whose size is still unknown, is remarkable by its large number of marble architectural fragments spread out over the shore. One of the most important monuments on the forum, standing on its Southeast edge, is the civic basilica. On the northeast side of the forum area was built a big temple. On the southwest another impressive building in which some architectural elements *i.e.*, capitals and columns remain on the surface. As for the structures for entertainment, they are represented by a theater, an amphitheater, and a bath.

The amphitheater was located on the edge of the town. Only part of the outer wall is still standing there. The arena, which is in a poor state of preservation, is surrounded by a series of rubbles. The freestanding theater is still standing along the coast. With its 100 m diameter, the cave resembles the one of the Libyan Sabratha city.

The North baths already excavated under the French protectorate period are recognizable through the many fragments of collapsing vaulting, two pools and double-decker reservoir cisterns usually fed by an aqueduct.

The port city Meninx had some commercial buildings, such as the Horrea excavated by Drine and the macellum. The Horrea corresponds to a narrow court paved with slabs flanked by some shops. As for the macellum, it was located off the forum square. It consists of a series of shops along the exterior walls framed by a large, open rectangular space. A circular central structure dominated the open space: there was also a fountain whose water was used to clean the market where different kinds of victuals were sold, such as fish, meat, and vegetables. From this huge archaeological site, only three monuments were protected by a decree which dates to 13-03-1912; they are: The Roman Forum, the Christian Basilica, and the catacombs.

Souk elGuébli

The necropolis of Souk El Guebli consists of tombs with a complex plan, consisting of three distinct elements: a dromos, a courtyard and funerary chambers disposed around the patio. These rock-cut tombs, the most ancient of which date to the 3rd century BCE, have been reused since the 3rd century CE.

Inside these chambers there are several niches, usually facing the entrance. Among other accessories there are benches along the three sides obtained by cutting a rectangular basin in the center of the room. In another tomb three sarcophagi were cut from a stone: two were characterized by a stone pillow, while the third had a sculpted mattress. Rites practiced in this cemetery include both inhumation and cremation.

The excavations recently carried out brought to light the remains of a dwelling of the second century BCE. As for the prospecting, they yielded some remains of kilns which produced wine amphorae as well as common ceramics.

Gataya elBahrya

Seven sites have been discovered on this island situated in the southwest of Djerba. They are the following:

Site 1: Remains of an ancient construction. Its walls consist of limestone rubble and sandstone. Its immediate surroundings are scattered with a lot of late Antique ceramics (African sigillata and amphorae) and some fishing gears, *e.g.*, net sinkers made of drilled limestone. This building is not well maintained, since only the lowest part of the walls is preserved.

Site 2: Remains of a wall and some tegulae. There are a lot of Roman ceramics. These remains probably correspond to a dwelling.

Site 3: Remains of a house with pre-Roman ceramics.

Site 4: Quarry and tomb with a lot of pre-Roman material (Neo Punic amphorae and black glaze vessels). Its current state of preservation indicates clearly that it was looted and disturbed. Some of the blocks lying in situ, have not been extracted yet, bear traces of scrape marks. Wedge splitting methods for the quarrying processes have been used. The size of some of the blocks is recognizable, as the wedge gaps are visible. They roughly measure 1 m height by 50 cm wide.

Site 5: Roman ceramics with a great concentration of broken unguentaria (small vases used to contain perfume) along with some animal bones. This site probably corresponds to a votive deposit with the remains of consumption.

Site 6: Cistern with a large impluvium to collect water from rainfall. It is still in a good state of preservation. It was probably firstly used in antiquity before it has been reused in Medieval and Modern times.

Site 7: Remains of an Islamic mosque-watch which was being used to control the maritime passage between El Gataya el Bahriya and the west southern coasts of the island. It is in a bad state of conservation, as its vaults are collapsing as well as its walls made with rubbles and lime mortar.

Not far from the coast many murex shells caught by fishermen were consumed as a foodstuff and not smashed as was the case in Meninx during antiquity.

On the beach-rock which surrounds this island, there are a lot of ancient ceramic sherds embedded. This indicates that the beach-rock has not been shaped before the Roman period.

Gataya Gablya

It consists of some sporadic remains represented by fragments of Neo Punic amphorae and Roman ceramics. Unlike the Gataya Bahriya, this island was scarcely frequented in antiquity.

Dzira

It is a small island situated in the southwest of Djerba in front of Borj Jilij.

There are some ancient ruins represented by walls built with ashlar (opus quadratum) and many areas covered with scattered ceramics. Nowadays this island is used by fishermen who deposit their fishing gear such as ceramic pots to trap octopuses.

Ghizène

The site lies on the northern coast of the island, 6 km east of Houmet Souk. Even though it has been discovered in the middle of the last century, the site of Ghizène has remained scarcely explored archaeologically and has seen only a few publications. The first excavations were carried out by P. Quoniam in the 1950s and focused almost exclusively on the funeral area. This documentation was restudied by J. Akkari-Weriemmi in a more recent publication (1995).

It seems to have been laid between this shore and a small inlet, now silted up. The site measures around 5 hectares. The rich pottery runs from the 6th century BCE through to the 7th CE. Ghizène must have been one of the ports that served Henchir Bourgou, an autochthonous site settled inland.

The excavations carried out there in recent years brought to light remains of dwellings on both sides of a road close and parallel to the sea, consisting in some rooms laid out in a row.

This site was cut by the sea in front of which appeared some damaged structures, namely a cigar-shaped cistern.

Necropolis

The tombs brought to light by P. Quoniam can be gathered into three types:

- Tombs of the “well” with a single chamber. The tombs are reached by a steep stair in the “well” with steps cut into the rock along the side. At the bottom there is a rectangular burial chamber with an entrance blocked by a monolithic slab.
- Tombs of the “well” with two funeral chambers. As in the preceding type, it is accessed through a stair cut into its sidewall. The two square funerary chambers face each other on either side of the well. Besides, they have entrance portals blocked by slabs.
- Courtyard tombs with multiple funerary chambers.

The archaeological site of Guellala

The site of Guellala, the ancient Haribus, is known for murex dumps scattered on the coast. In fact, they testify to the purple dye industry which dates to the Punic period.

Its harbor in the form of a jetty with a platform has been identified recently in addition to numerous walls built near the coast probably in connection with warehouses. Due to its location in the south of the gulf of Boughrara and its position on the route towards Tripolitania, this site was open to Mediterranean trade, as it seems to be confirmed by ceramics imported from Africa and elsewhere. This material arrived at Guellala through a port that was recently discovered.

Ceramic stands for the occupation of the land that took place between the 5th century BC and the 7th century AD. Only two tombs have remained: one looted and another preserved. The latter has yielded a rich funerary material from the 2nd century AD, consisting of ceramics and metal objects. The glass urns that were discovered there show that the rite of cremation was practiced.

The sea has advanced a lot at the expense of the continent. show. Besides, only two tombs remain: one looted and another preserved. The latter has yielded a rich funerary material from the 2nd century AD, consisting of ceramics and metal objects. The glass urns that were discovered there show that the rite of cremation was practiced.

El Hardoub

It consists of Roman structures of dwellings situated next to the shoreline between Cheikh Yahia and Sidi Jmour.

Cheikh Yahia

Wall trenches cut into the beach rock which corresponds probably to the boat shed.

III.1.2. The defense system

This system is composed of a defensive frontline guarding the coast made up of fortresses, gun platforms, conning towers, and fortified mosques with an average of one platform in every 2km. Fortresses are high-walled buildings equipped with defense such as gun platforms, batteries, and control towers. Some of these fortresses are rectangular and some others are squared except the scorpion fort, Borj El Agreb, located in the south part of the island which is circular.

- « Tabkhana »: These small defensive artillery platforms are equipped with cannons to back up the fortresses. They are unique since nothing similar was found along the Tunisian coast.
- « El Assa »: These buildings are small with simple architecture. The establishments have been used to control the coast to alert the arrival of invaders by watching their ships and immediately announce their arrival using signals.

- The fortified mosques: these monuments look like fortresses. They are surrounded by a thick parapet pierced with loopholes reinforced by solid buttresses and surrounded by benches. These mosques also have Machicolations-Saqqatat-control tower-like above its doors and minarets to emphasize its defensive role. As for their minarets, they are shaped like a tower with crenellations and merlons at the top. They are crowned by semi-conical lanterns resting on columns.

Borj Ghazi Mustapha

The Ghazi Mustapha Fort is situated in the northern part of Houmet Souk, near the main anchorage of the Island. This monument, 68 meters long and 53 meters wide was built during the Hafsid era under the aegis of Abu Fares Abdelaziz.

Its curtain walls, surrounded by a moat, are traversed by projections and rectangular and round towers. The fort is accessed through a two-leaf door topped by a semi-circular arch. We then cross a chicane corridor that takes us to a large courtyard containing the remains of walls, vaulted rooms, and the remains of another 40 meters long and 40 meters wide Fort. It is known for its shape and architecture, being equipped with rounded tank towers on the northern façade and octagonal towers on the southern one, reminiscent of the Aghlabid or Fatimid ribats. It allowed for the easy movement of the galleys that guarded the island.

Borj Ghazi Mustapha was the setting of several wars and sea incursions. The last battle was between the Ottomans and the Spanish in 1560.

In 1576, the governor of the island Ghazi Mustapha conducted a series of restoration works that allowed the Ottoman garrison to take up residence in the fort.

At the same time, the famous tower of skulls was built. It is a “monument” intended to celebrate and immortalize the last victory of the Ottomans over the Spanish in 1560. On the orders of Ahmed bey, this tower was dismantled and replaced by a commemorative stele erected in stone.

This fort continued to be used as a baseline to guard the dangers arising from the sea, especially those of the fearsome pirates of Saint Jean de Malte and the order of Saint Etienne. It is in this context that the inhabitants of Djerba began to fortify the mosques and build guard stations on the coast.

1915 marked the classification of Borj Ghazi Mustapha as a historical monument by a beylical decree.

Following the first restoration work which took place in 1969 by the National Institute of Art and Archaeology, the monument was opened to the public for the first time in the early 1980s.

Nowadays, the monument is managed by the “Agence de Mise en Valeur du Patrimoine et de Promotion Culturelle.” At the same time, it serves as the head office of the National Institute of Heritage of Djerba.

Borj Jilij

Constructed in the 14th century, it underwent major reconstruction under the reign of Hammouda Bacha in the 18th century. Settled at an elevation of 20 meters, it controlled one of the main maritime routes leading to Houmet Souk. Today, it is housing the military forces.

Tower of the skulls

It was built by Dargouth Pacha west of the Ghazi Mustapha fort with the bones of the Spanish soldiers after the battle of 1560. In 1848, Ahmed Bey, who ordered its dismantling, replaced it with a stela which still exists today.

Pharos of Taguermes

Located in the northeast, the pharos of Taguermes dates to 1895. It was settled on an ancient guard station that dates to the 16th century. It is used nowadays by the Military forces.

Fort of Sidi Garous

It is situated in the Southeast on a promontory between the two berths, namely Es Saguia and Ras Rougga. Near this fort there is a marabout which gives its name to the whole area. Next to this marabout there are Roman ruins, some of them are built with the opus quadratum. This monument is in a bad state of preservation. According to Abou Ras El Jerbi, there was a watchtower mosque.

The lookout of El Gala

The lookout of El Guala is situated halfway between Houmet Souk and Borj Jilij. It has a rectangular shape, 5m long and 3m wide, pierced by a hole. It is in a bad state of conservation.

BorjAghir

It is located near one of the most important berths in the south. Constructed in the 16th century, BorjAghir underwent many transformations that mutilated it.

Borj Ajim

This fort is spread over an area of 750m². It was probably constructed under the reign of Ali Bacha Al Husayni in the 18th century. It is used nowadays by Customs.

BorjTerbella

Located on the cape of Tarbela, its remains consist of rubbles and bricks scattered around. It controlled a maritime passage known as the dromedary route which was being used by the caravans when there was low tide. This route was strategic since it was integrated into one of the conflicts that opposed Alphonse V to Abou Faris Abdelaziz in 1432. It is poorly preserved.

The scorpion fort

This fort is situated in the core of the Boughrara gulf between the Cape of Tarbela and Rsifet in the peninsula of Akkara. It has a round shape and inside it there is a courtyard surrounded by eight rooms. Its exterior wall is equipped with loopholes. It might have been constructed by Dargouth Pacha in the middle of the 16th century.

The fort of Gastil

It is in the southeast of Djerba, 9 km far away from Aghir. It was constructed in the 13th century on a marsh. It is 40 meters long. Its wall is 12m high. As for the façades, they are partly deteriorated except the north side which is better preserved. It is the second most important defensive monument after Borj Ghazi Mustapha.

In its current state, this fort dates to the time of Dargouth (1551). But its first core dates to the 13th century and more precisely to 1284 within the framework of the Norman invasion of the island under the command of Roger II de Lauria.

Tobkhana Marsa Seguia

It is a defensive monument, located between the Berthe of Essaguia and Sidi Garous. The Topkhana, a Turkish word, is a kind of platform equipped with cannons. It is noteworthy that Essaguia was one of the first areas that were fortified by the Ottomans in 1560.

III.1.3. The mosques

The mosque of Sidi Hachani

The mosque of Sidi Hachani, built in the 16th century, is situated in the eastern part of Ras Rmel. It is completely underwater.

The mosque of Sidi Salem

It is in Chott Khanfous, 4 km west of Houmet Souk. It was built on an outcrop. In fact, this monument consists of two parts. The first one is composed of four rooms surrounded by a bench. Three of these rooms are vaulted and the fourth is surmounted by a dome. The second part consists of a prayer room made up of three vaulted rooms.

In 1560, the Spanish landed there before heading to Houmet Souk and attacked the fort of Ghazi Mustapha. This mosque was restored in 2010 and is currently frequented by the prayers.

The mosque of Sidi Zaied

This mosque is situated on the northern coast of the island, on an outcrop between Houmet Souk and Ras Rmel. It consists of a prayer room in the southwestern corner situated close to the cupola topped marabout of Sidi Zaied. Next to it there are two annexes and a large cistern. This monument is surrounded by a fence.

According to some historical sources, this mosque played an important role as a watchtower until the 18th century. Since that time onwards, it has become devoted to prayer and to the poor it served as well as a refuge.

The guardhouse of Sidi Zaied

The guardhouse of Sidi Zaied is located 500 m from the mosque. It is in a bad state of conservation. Next to it there was a cistern. This monument consisted of a vaulted room.

Mosque of Guellala

This mosque is situated in Fahmine in the southwest of Djerba. It played an important role in the defensive system of the island. Neglected for a while, the monument was restored in 2010 by the Institut National du Patrimoine.

The prayer room extends on a square plan of 9.25m sides into which we enter through a rectangular door from the western façade of the room. The prayer hall is covered with eight domes supported by round arches that rest on square pillars of 0.45 m on each side.

Located in the northwest corner of the hall, the minaret has a square cross-section of 2 m on each side and is topped by a dome that rests on six stone columns. The main east-facing façade also has a staircase with seven steps. It was once used for the call to prayer and is located on the outer wall to the right of the door.

The southern wall of the Qibla has two mihrabs projecting from the outside. Recently surrounded by an enclosure, the mosque also has two cisterns, a set of outbuildings and a Qur'anic school with a square floor plan measuring 4 m on each side and topped by a dome that rests on four corner trunks.

This mosque is distinguished by its massive appearance that resembles the fortresses just like the mosque of Sidi Yati elsewhere. Its minaret is visible from the bay of Boughrara.

Mosque of Sidi Mahrez

This mosque is located east of Ras Rmel on the Northeastern coast of the island. The original plan shows a monument with a square shape of 3 meters on each side, topped by a dome. Next to it is a vaulted room. Its main function was to control the coast and to warn the mosques of the second defensive line. It underwent an important redevelopment during these last years.

Mosque of Sidi Smaen

The mosque belongs to the quarter of Fatou. Situated between Houmet Souk and Ras Rmel, this mosque has a rectangular shape. It consists of a prayer room, a portico and three annexes. It is in a good state of preservation.

The guardhouse of Sidi Smaen

Not far from the mosque of Sidi Smaen are the remains of a gatehouse completely ruined. This gatehouse was inventoried by the students at the military school of Bardo.

The guardhouse of Sidi Zekri

This buried monument is situated northwest of the mosque Sidi Zekri and the northern coast of the island. It is in a poor state of preservation. In case of danger at night, the alert was conveyed through the torches lit on top. However, when danger arises in the daytime, smoke is emitted as a warning signal.

Mosque of Sidi Zekri

It lies 8 km far from the pharos of Taguermes on a natural outcrop. This monument includes a marabout and a prayer room. This latter is buried and only two domes are visible from the outside. Its access is through a staircase. The room, which has two niches, is divided into two parts by an arch whose keystones are made of ashlar. The dome of the eastern part of the monument has been recently restored. The western dome is crossed by venting and lighting holes. As for the room of the marabout, it has a square shape and it is named after a soldier-monk.

Mosque of Sidi Jmour

This mosque is built on a rocky outcrop and situated on the west coast of the island. Mentioned twice on Spanish maps of the sixteenth century under the name of Agimar, the site of the mosque was known in the Middle Ages by its strategic location and its military role.

Sidi Jmour Mosque has two separate prayer rooms. The upper one is perched on a platform of an almost square shape of 10 m of side, accessible through narrow stairs. Its main facade is pierced by a door representing the only opening in the space. The walls are 1 m thick and are supported by buttresses of different sections. A conical minaret in the northwest has a height of around 1.25m.

The second prayer room, known as the arcade mosque, has a rectangular shape, 8.3 m wide and 11.5 m long. It is accessed through two doors and its qibla wall has a mihrab niche of 1.75 m high, 1.75 m deep and 0.95 m wide.

The interior of the building is divided into three naves that run parallel to the qibla wall. These naves are delimited by two series of arcades formed by horseshoe arches supported by squaring pillars. Each nave is covered by a barrel vault.

A burial chamber housing two tombs is situated north of the arcade mosque. It is a sepulchral chamber constructed in the 1950 s., according to archive photos. It is a small longitudinal room 3 m long and 4 m wide. It is topped by a dome of 2.5 m in diameter.

Another entity known as JamâaElkoubba or the mosque of the dome, was probably added a few meters north of these two prayer rooms, to accommodate the growing number of worshippers when the mosque of Sidi Jmour became a Zaouia. This complex also includes six cisterns.

Nowadays these mosques are no longer used for prayers. Their surroundings are used by the local population as a place of meetings. As for its chronology, Sidi Jmour should date back at least to the 16th century.

Lella Hadhria

This monument is installed on a mound of 7m in height near the lighthouse of Taguermes. Its plan is circular with a radius of 13.50 m. Its foundations are made of cut stones. It has been partly deteriorated due to the natural factors (wind and sea). It took the name of an old militant warrior.

Sidi Amghar

This mosque was built on the coast in front of the island of Gataya on an archaeological site. The mosque has the shape of a square-topped by two vaults. The southern wall is crossed by a niche. In fact, it played an important role in the control of the west coast to become a marabout, dating from the end of the modern era. Amghar probably corresponds to the name of a monk who lived there.

Mosque of Sidi Yati (Guellala)

It is an Ibadite coastal mosque built on a rocky outcrop on the southwest coast of the island. A position dictated by the function of mosque-watch provided by the building at the time of its foundation. Indeed, the mosque Sidi Yati was part of the first defensive line formed by several coastal mosques known locally as “Masajedechott”. Moreover, its name is attached to DjerbeNukkarites leader who lived in the tenth century « Yeti Mestaoui », uncle of Abu Meswer founder of Hashen great mosque. In fact, the building has been restored several times and the last restoration occurred in 2019.

It is an architectural complex that occupies a rectangular space measuring 20 m long and 16 m wide.

The prayer room, with a square plan of 8 m on each side, is in the northwest corner of the courtyard. It is accessed through a door in the eastern façade, which is the only opening in the room. The interior space is divided into two series of arcades. Each arcade is composed of two horseshoe arches. The intersection of the two arches in the center of the room split the interior space into four compartments. The arches are supported in the center by a column of 50 cm in diameter, topped by a Corinthian capital.

The prayer room is covered by four domes whose transition from square to circular plan is ensured by corner trunks. In the middle of the southern or qibla wall, a mihrab that projects from the outside, has a form of a semicircular niche.

Located in the northwest corner of the room, the square minaret is accessible from the inside by a staircase consisting of ten steps. The base of this minaret is surmounted by a skylight with a degree.

The main facade facing the east has a staircase against the outer wall, which was used to call for prayer. Another staircase to the right of the entrance door separates the prayer room from a rectangular room covered with a vault.

On the southern side of the courtyard, there is a summer prayer room flanked by two annexes, known locally as a Bortal. It is a rectangular gallery measuring 11 m in length and 4.3 m in width that opens onto the courtyard through five semicircular arches. It has a mihrab in the center of the southern wall directed to the qibla and is covered by a recently restored flat wooden roof.

Opposite the prayer room, is a funerary room with a square floor plan measuring 5.3 m on each side. It is served by a rectangular door in its southern wall and is covered by a dome that rests on four corner trunks.

Mosque of Sidi Slim

It is located between Sidi Slim and BorjAghir. The monument lies in a paved place surrounded by a fence. It consists of a room of 3x3 m the southern wall of it is crossed by a niche. The room is surmounted by a conical dome. This monument is in a good state of conservation.

Mosque of Sidi Bouarous

This monument is located south of the Ajim anchorage and directly overlooks the strait that separates Djerba from the mainland. It is completely renovated. Originally, it consisted of a room topped by two vaults. It appears in the list drawn up by the students at the military school of Bardo in 1857.

Mosque of El Guetaia El Gueblia

This mosque is located at an elevation at the extreme south of the islet of El Guetaia El Gueblia itself located southeast of Cape Ajim. It is a small rectangular monument 5.20 m long and 2.50 m wide. It is in a bad state of conservation. It was an important control point to watch the Ajim Strait.

III.1.4. The historic center of Houmet Souk

According to a commonly accepted tradition, the city formerly called Souk El Khémis, might have been founded by the merchant Wahbi preacher Abou Messouer at the end of the 9th century.

Djerba economic history of Houmet Souk city has always been closely linked to trade. It was a place of exchange that brought together traders, local and foreign craftsmen from several horizons. This trading place has widely developed thanks to two factors: first, its location on a sea route that leads to Tripolitania and the East. In fact, such a route has always been frequented since antiquity. Then, the security of the site was favored by the construction of the fort (Borj El Kebir) probably under the reign of the Aghlabides.

Houmet Souk became a very important port city from the 12th century onwards: ships heading to Alexandria stopped there to load various goods (oil, wool, grapes...). Catalan galleons also stopped there to be loaded with oil, apples, wool, gold, and slaves.

Throughout its history, the Fondouks (a kind of caravansérail), whose number reached about twenty, have been devoted to specified activities. In fact, in addition to wool (Fondouk El Laffa), some of these buildings were used for tanning (Fondouk El Jeld) and basketry (Fondouk El Hsaier) practiced by basket makers, almost all of them from Chahbania (Tataouine) from where they brought the raw material (the rush).

There are several souks which have completely disappeared after their prosperity, such as Souk El Guébli, or by some historical sources (Souk Aberran particularly flourishing in the seventeenth century).

« El Ghorba », one of the most important mosques was protected by a decree on 16-11-1928. The « El Ghorba » mosque offers a perfect transition between the Ibadite and Malikite buildings. In fact, the Ibadites had reserved the district of Taourit for the foreigners, in the extreme north of the island, and had built the Barzīn mosque almost in the 13th Century. Later, in the first half of the 15th century, this building was converted to Malikism under the new name « El-Ghorba » which designates non-Ibadite foreigners, whether Muslim or Christian. One of the landmarks of the city is its minaret, crowned by a frieze of Koranic verses painted in black under a crenelated parapet.

Sidi Ibrahim Jomni is another important mosque also protected by a decree on 16-11-1928. This monument is part of a complex which comprises a Fondouk and a bath. It was originally a Malekite school dating back to the year 1701. This school was established exclusively for the scholar Ibrahim El Jomni and to the application of the Muradite and Husseinte policy. It is used to spread the Malekite rite on the island and provide its fellows with wide support. The monument is made up of different architectural units the most important are the prayer room, the courtyard, the porticos, the ablution room, the koranic school and the student rooms.

The so-called « three soldier-monk's domes » is the other protected monument by a decree of 16-11-1928.

Reed fishing weirs.

It is a traditional fishing technique that has an ancient origin. Although it is known that net fishing is also widespread. In fact, the system consists in planting long two-meter-high palm fences within the sea. The fixed fishery has the shape of a wide-angle, with a bisecting line called « beating wall ». Each side of the angle has two walls, lining up a corridor that gets narrower and narrower the closer the fish get to the capture chambers. These chambers contain several traps that have the shape of a hoop net, Drina. The fish that get trapped there can no longer escape. The following day, the fisherman, aboard his boat, pulls the hoop net up with a pole, and replaces it with another one of the following captures.

III.2. Threats and risk analysis

Some of the archaeological sites are crossed by modern roads, such as Meninx. Indeed, one of the routes joins Al Kantara to Houmet Souk (MC 117). The second (MC 941) turns off this to the east towards Aghir; the third MC 944 turns west of the causeway Guellala and Ajim. The other category of threats is represented by some of the ancient tombs plundering (*e.g.*, necropolis of Souk El Guébli) and mosques as they are thought to be containers of treasures. The other risk consists in the destruction of the rocky outcrop in which some funerary monuments were cut. Some of the archaeological sites (*e.g.*, Gataya and Dzira) are threatened by the lusts of land speculators.

The site of Ghizène illustrates another kind of threat and risk, as the whole site plots are privately owned. The owner can build upon the archaeological remains at any time since there is no legal protection.

Some other sites are seriously threatened by marine transgression. This is the case of Meninx in which the shoreline has advanced 80 meters from antiquity to the present day. That's why some monuments are partly underwater, such as the macellum (Roman market). One of the Islamic mosques, namely Sidi Al Hachani has completely disappeared because of the marine transgression.

Because of the absence of both regular restoration and preventive conservation, some of the monuments such as Borj El Gastil, Borj Ghazi Mustapha, are in a very bad state of conservation. They suffer from structural deterioration which consists of the collapse of some interior and exterior walls as well as subsidence and cracking of the others. Many stones are unstable and are at risk to fall. The mortar and coating are also badly preserved. This process is accelerated by water infiltration and capillary seepage.

The route for visitors is poorly identified and the signage is missing. There is also an absence of attractive activities such as programs or support for storytelling.

III.3. Recommendations

- Initiating Legal protection based on the « Heritage Code » (decree promulgated on February 24th, 1994), amended on May 25th, 2011.
- Creating cultural sites (Title II, Chapter I, Article 7) followed by Management Plan (Title II, Chapter I, Article 8).
- Classifying the historical monuments (Chapter II, Article 35-41).
- Creating services in charge of heritage management within the municipalities.
- Ending uncontrolled urbanism and illegal constructions.
- -Practicing a conscious interventionist policy.

- Transmitting the know-how in collaboration with the craftsmen from the old to the new generations.
- Labeling of know-how. Re-establishment of the stamping system. Return to quality products in terms of texture, weight, and dyes. Labels will be granted only to products that meet specific standards.
- Rehabilitating the craft pilot center.
- Creating craft groups/corporations that can be responsible also for the sub-distribution of credits.
- Renovating and improving techniques related to traditional craft (e.g., pottery production), so that it can meet the people's needs.
- planning tourism by:
 - Selecting the most suitable sites.
 - Respecting the management plan for safeguarding and enhancing the heritage.
 - Respecting the local environment and architecture.
 - Establishing serious and regular control of everything that is going to be done.
 - Involving different layers of people and organizations in the decision-making (bank managers, companies, industrialists, merchants, foundations).
- Implementing exhaustive/systematic monuments inventory using GIS and all kinds of appropriate, modern, and updated documentation.
- Communicating strategy to make this heritage known and accessible as well (involvement of the civil society and local communities). Designing activities that involve children in creative and exciting experiences. besides, organizing creative workshops related to aspects of daily life in the ancient world, to myths: meeting and exchange of experiences. The organization of exhibitions and conferences should be very helpful to recognize the cultural and artistic value of heritage and environment (Lausanne charter 1990).
- Ensuring the future existence by the rehabilitation, reallocation, and animation of the old buildings.
- Creating a transversal cultural circuit. The route is very important because it connects everyday life with the city that no longer exists. This also reinforces the idea that the island is an entity.
- Integrating the intangible elements of the heritage allows the tourist, who is not only observing the place, to meet with the lifestyles and cultural archetypes of the communities: « the culture of the places ».

The cultural circuit provides reading contents and instruments, which represent an additional symbolic value concerning identity. It allows better visibility and legibility of these goods, as well as the possibility of identification in the territorial whole of the culture present on the territory.

To sum up, the recommendations include 3 phases: knowledge stage (surveys, photos), conservation stage (preservation, restoration...), management stage (valorization and exploitation). One of the main social objectives is to facilitate the transmission of the meanings that each object of the past carries.

The suggested valorization type follows a principle of sustainable development based on maintaining the attachment of a community to its territory, its environment, as well as the knowledge and rediscovery of its history. In other words, a pact by which the community commits itself to take care of its territory.

III.4. Action plan

Following these recommendations, four actions can be proposed according to their feasibility. Some of them can be realized within the frame of a Public-Private Partnership (PPP).

1. Rehabilitation of a labeled Menzel. It is noteworthy that some of the owners are eager to preserve their heritage. In fact, this action should include the following stages: classification, restoration, rehabilitation, agricultural exploitation of its territory, reallocation of this Menzel to a touristic activity (guest house) that reflects a traditional way of life. It is important as well to start with a pilot project. This kind of investment can encourage people to enhance and take care of their legacy.
2. Creation of an archaeological park at Meninx (Table 1). This project was already initiated within international cooperation between the National Institute of Heritage and the Ludwig-Maximilian's University and the GIZ. Since the archaeological and historic documentation is now available, it would be interesting to go further and open the site to the public. Cultural, economic, and touristic activities can be developed in the vicinity of the site, such as restaurants.
3. Creation of a circuit: Among the most important actions that can be realized are mainly the circuit creation that tells the story of the island. Another circuit also can be important that can strengthen the defense system including fortified mosques and military buildings as well (*i.e.*, lock-out, towers, forts...).
4. Temporary exhibitions: It is another way to tell the centuries-old history of the island, exposing each time and during a determined period. This allows to transmit the values of heritage such as cultural diversity, aesthetics, and art as a human creation.

Table 1. Projects developed in Djerba Island

Title	Year of implementation	Observation	Established by:
Agenda 21 pour un développement durable de l'île de Djerba	1997	Concerted action in 2002	ASSIDJE
Projet de création d'Aires Spécialement Protégées à l'île de Djerba en Tunisie : Etablissement d'un dossier technique et administratif	2000	The zones are classified in 2007	ASSIDJE
Projet de création d'Aires Spécialement Protégées à l'île de Djerba en Tunisie : Rapport d'expertise sur la composante marine du projet	2001		ASSIDJE
Les indicateurs de suivi de l'environnement et du développement durable à Djerba	2004	Observation project of the environment and sustainable development in Djerba	ASSIDJE
« Green Djerba » pour un label de développement durable de l'île de Djerba	2020		ASSIDJE
Gestion de zone sensible : la presqu'île Bin El Ouediane	2000		APAL
Gestion de zone sensible : Ras Rmel	2000		APAL
Etude de développement Agricole intégré de l'île de Djerba	1998		CRDA
Protection des ressources Marines et côtières du Golf de Gabes	2002	Intervention Plan 2011	MEAT
Etudes sur la gestion durable des systèmes insulaires de Tunisie	2016		APAL
Etude du potentiel de création d'emplois verts dans le domaine de l'adaptation des zones côtières au changement climatique.	2021		APAL
Etude sur les ressources en eau côtières et les impacts de l'élévation du niveau de la mer, Tunisie	2018		APAL
Elaboration de la Stratégie Nationale de Gestion Intégrée des Zones Côtières Programme d'Aménagement Côtier pour le site de Jerba	2019		APAL
Pour une gestion concertée de la zone humide de LellaHadhria dans la perspective de la préservation d'un écosystème et d'une biodiversité menacée.	2020		Moez Harabi
Caractérisation de la végétation benthique dans la lagune côtière de LellaHadhria(Djerba, Tunisie)	2020	Preliminary report	Aslam Sami Djellouli
Rapport Sur la Gestion Durable Des Zones Humides en Tunisie	2018		OTEDD

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