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Strategy and Action Plan for Sustainable Tourism in Tyre Coast Nature Reserve and SPAMI, Lebanon – Final report

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Executive Summary

This report presents the findings of an assessment of the current tourism practices within the Tyre Coast Nature Reserve (Lebanon) and proposes sustainable tourism strategies to minimize negative environmental and socio-cultural impacts. The assessment included a review of existing literature, stakeholder consultations, and site visits.

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1. Overview of the project

The ENSERES Project (ENhancing Socio-Ecological RESilience in Mediterranean coastal areas) is an ENI CBC Med capitalization project that is funded by the European Union (EU) and aims to mainstream available ecosystem-based management tools in Integrated Coastal Zone Management (ICZM) processes for preserving coastal and marine ecosystems as sustainable livelihoods for coastal urban communities, through integrated management of human activities.

The ENSERES project particularly aims to empower practitioners and local communities in Mediterranean Marine Protected Areas (MPAs) and their surrounding territories to benefit from sustainable financing schemes and tools for effective management and protection of biodiversity and to strengthen the resilience of both these communities and ecosystems to global changes.

The primary objective of this study is to assess current tourism practices within the Tyre Coast Nature Reserve (TCNR) in Lebanon and propose sustainable tourism strategies. The specific tasks include:

- Conducting a comprehensive assessment of the current tourism practices within the TCNR;
- Evaluating the existing tourism infrastructure, activities, and visitor management practices in the reserve;
- Assessing the environmental and socio-cultural impacts of tourism on the TCNR;
- Identifying key stakeholders and engaging them through consultations to understand their perspectives and concerns; and
- Developing a set of recommendations and guidelines for sustainable tourism practices to minimize negative environmental and socio-cultural impacts.

2. Description of the reserve

The Tyre Coast Nature Reserve (TCNR) is a Wetland of international importance and Ramsar Site under the Ramsar Convention since 1999. It is located on major migratory routes, where internationally important bird species have been identified, and was designated in 1984 by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as a World Heritage Site.

The reserve is divided into three zones (*Figure 3.1-2*): a tourism zone, which includes a 900-meter public beach that can accommodate up to 20,000 visitors on a busy summer day; a 900-meter conservation (Scientific) zone that serves as a sanctuary for sea turtles and migrating birds; and an agriculture zone that hosts the archeological site of Ras El Ain springs. The scientific and agricultural zones are separated

by the presence of the Rachidieh Camp, a Palestinian refugees camp that is not under the jurisdiction of the TCNR.

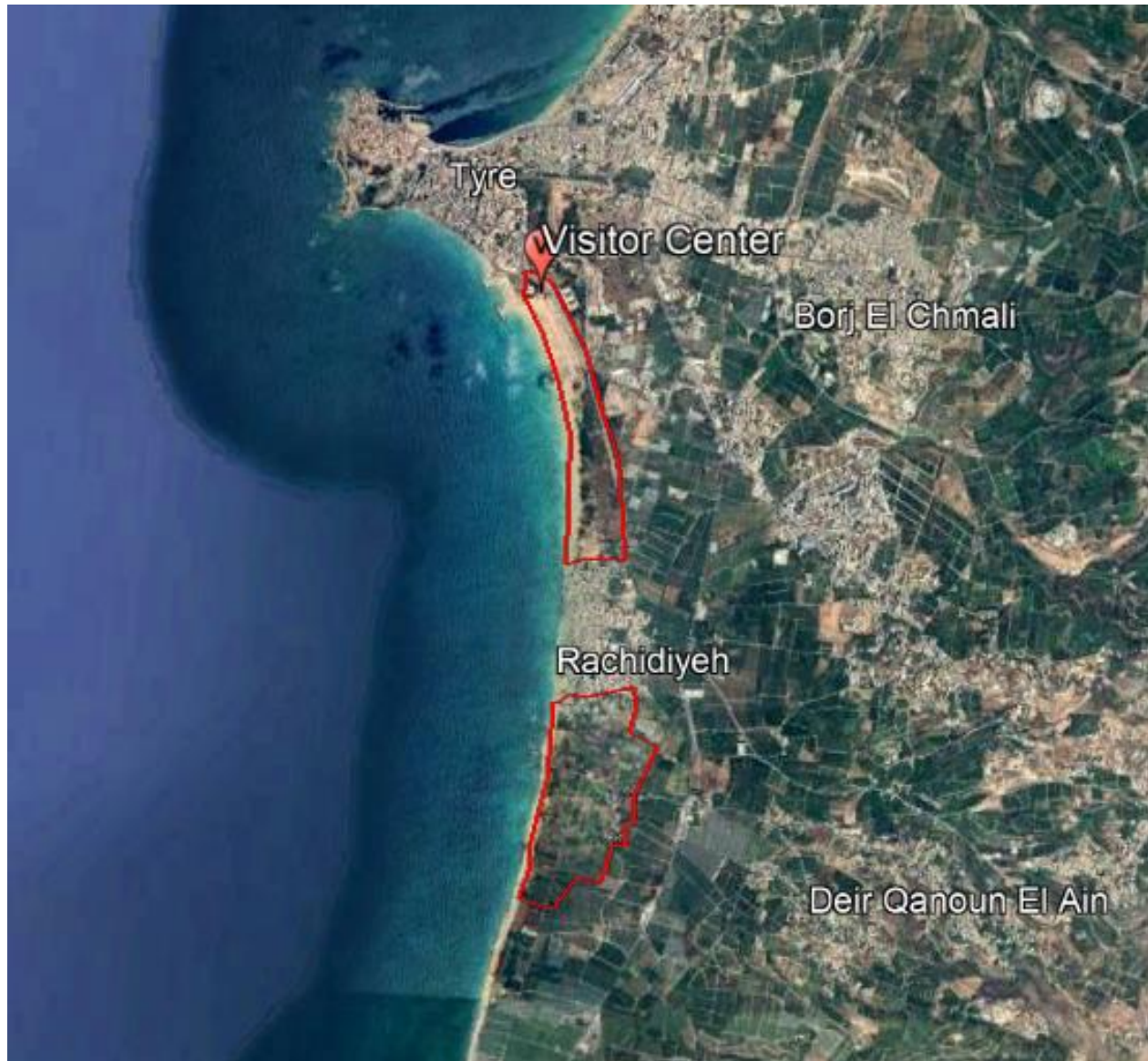


Figure 3.1-1 Map showing the location of the reserve

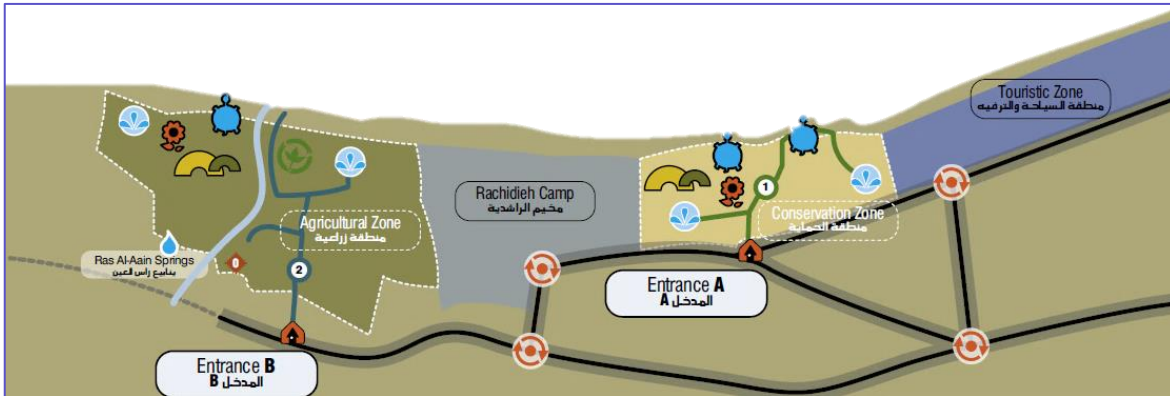


Figure 3.1-2: TCNR Zones

3. Methodology

The research methodology for investigating sustainable tourism practices in the TCNR involved a multifaceted approach that included information gathering, infrastructure assessment, stakeholders' engagement, and environmental and socio-economic impact evaluation.

3.1. Information Gathering

Literature review covered documents and books dealing with the reserve and the City of Tyre. The TCNR management plan is an important document as it presents the long-term vision for the protected area. The review covered past, current and planned future projects and activities for the TCNR.

The communication material is important, in particular the reserve's website and social media, as shows the pivotal role they play in disseminating information to visitors and stakeholders. These communication tools provided an insight into the activities and the projects done by the reserve.

Statistical data on number of visitors and primary sources of income was obtained directly from the TCNR management team and from the municipality.

The obtained data allowed a good understanding of how the TCNRs sustainable tourism initiatives are being achieved. The data permitted an understanding of the reserve's current state, the capabilities of the site's management team, and the future aspirations in terms of sustainable tourism.

3.2. Infrastructure Assessment

An evaluation of the current tourism infrastructure in the TCNR was conducted. The team engaged fully in the visitor's experience, navigating the reserve trails, exploring the sand dunes (*Figure 3.2-1*), touring the scientific and agricultural sites, as well as the designated awareness station and visitors center. Detailed notes and photographs were taken to document observations, with particular attention to signage, visitor facilities, trails, accommodations, and other relevant infrastructure.



Figure 3.2-1: Sandy beach of TCNR

3.3. Visitor Feedback

An online survey was distributed through social media to gather insights into the visitor experience at TCNR (Annex 1). The survey sought feedback on the Tyre experience, including weather, primary destinations, preferred activities, beach enjoyment, impressions of the reserve and archaeological sites, signage clarity, accommodation satisfaction, local transportation, safety, comfort, community communication, challenges encountered, and recommendations for sustainable tourism. Respondents were also asked if they plan to return to Tyre in the future.

3.4. Stakeholder Engagement

Meeting was held with the reserve's manager Dr. Ali Badreddine, president of TCNR committee, and with Miss Hiba Fawaz representation the Association for the Development of Rural Capacity (ADR) (*Figure 3.4-1*) aiming to identify and comprehend the interests and concerns regarding sustainable tourism development (Annex 2). ADR has been collaborating with TCNR since its founding and is a key stakeholder in environmental protection and community development in the Tyre region.



Figure 3.4-1: Stakeholders meeting

3.5. Environmental and Socio-cultural Impact Evaluation

An evaluation of the environmental impacts of tourism activities in the TCNR was conducted. This evaluation assessed habitat degradation through changes in flora and fauna and evaluated waste generation and management practices. A tourism footprint assessment began by researching existing literature on tourism's potential environmental impacts and threats to biodiversity. Specific impacts related to tourism were assessed through local expert opinion.

4. Assessment Findings

4.1. Tourism Practices in Tyre

TCNR has witnessed a remarkable surge in tourism during 2023, with a substantial increase in visitor numbers ranging beyond 800,000, compared to the 500,000 to 700,000 recorded in previous years. This increase can be partly attributed to effective communication efforts by the management team of the reserve, which organized training sessions and workshops as stipulated in the management plan, attracting around 20,000 visitors to the research center of the reserve, alone.

Touristic activities and projects within the TCNR (

Figure 4.1-1) showcase a diverse range of initiatives aimed at environmental conservation, community engagement, and sustainable tourism practices. One notable effort is the Cleaner Beach Initiative, implemented under the Plastic Busters CAP EU Project ENI CBC Med Programme, focusing on combating marine litter along the coastal areas from Nakoura to Tyre. Workshops on coastal management and monitoring have brought together local communities and stakeholders to discuss proposed programs and actions, fostering a collaborative approach to ecological, social, and cultural potentials.

Within the BioConnect project that is financed by the EU, the different partners are contributing with activities that alleviate the stress on the reserve's natural resources. ADR is currently implementing training for the management team with the Al-Shouf Cedar Society (ACS) and is giving awareness sessions to farmers of the agricultural zone in an attempt to alleviate the impact of pesticides and traditional agriculture. The Association for the Development of Rural Capacities (ADR) is also constructing a fence to delineate the scientific area of the reserve. ADR also supported the purchase of a boat that can be used for multiple purposes. The Association for Community and Environment (ACE) are conducting monitoring for dunes and key species. ACE also conducted in-depth research on Ras EL Ain springs and investigated the springs' geological and historical background. The report recommended taking steps to enhance the site's geological and archaeological assets, to add it to the touristic map, and to advocate for protecting the springs.

The TCNR actively participates in various training programs, such as Marine Biodiversity training, Birds Monitoring, and workshops on turtle necropsy and marine litter impact. These activities emphasize unity, collaboration, and the importance of shared experiences in promoting sustainable monitoring, protection, and conservation. Additionally, TCNR hosts coordination meetings under projects like Plastic Busters CAP and Common - Med Project, facilitating discussions on beach cleaning awareness campaigns and combating plastic dangers.

The TCNR plays a vital role in educational outreach, hosting university students for projects combating plastic dangers and disseminating biodiversity knowledge. Turtle expositions in the awareness station and workshops on the socio-economic sustainability of Mediterranean Marine Protected Areas further contribute to raising awareness and fostering appreciation for the region's natural and cultural heritage. The ENSERES Project focuses on valorizing the Ras El Ain springs as a significant geo-site and touristic destination within the reserve, enhancing its appeal to visitors while promoting environmental preservation. Overall, these activities collectively contribute to TCNR commitment to sustainable tourism and the conservation of its unique ecological and cultural assets.

Touristic activities within the reserve encompass a spectrum of engagements designed to facilitate a scientific appreciation of its ecological diversity. These activities include kayaking and pedalos for aquatic exploration, snorkeling and diving to explore the marine environment, and bird watching to observe avian fauna. The popularity and participation in these activities generate a substantial income stream, reinforcing the reserve's capacity to uphold its conservation and educational initiatives.



Figure 4.1-1: Touristic Activities and Projects within the TCNR

4.2. Assess the Existing Tourism Infrastructure

The main infrastructure of the TCNR that supports tourism to various extant include Ras EL Ain Springs, Awareness Station, Terrestrial Trail, Marine Trail, Beach Huts, Research laboratory, Wooden Kiosk. This section presents details on each of the reserve's infrastructure located within its boundaries.

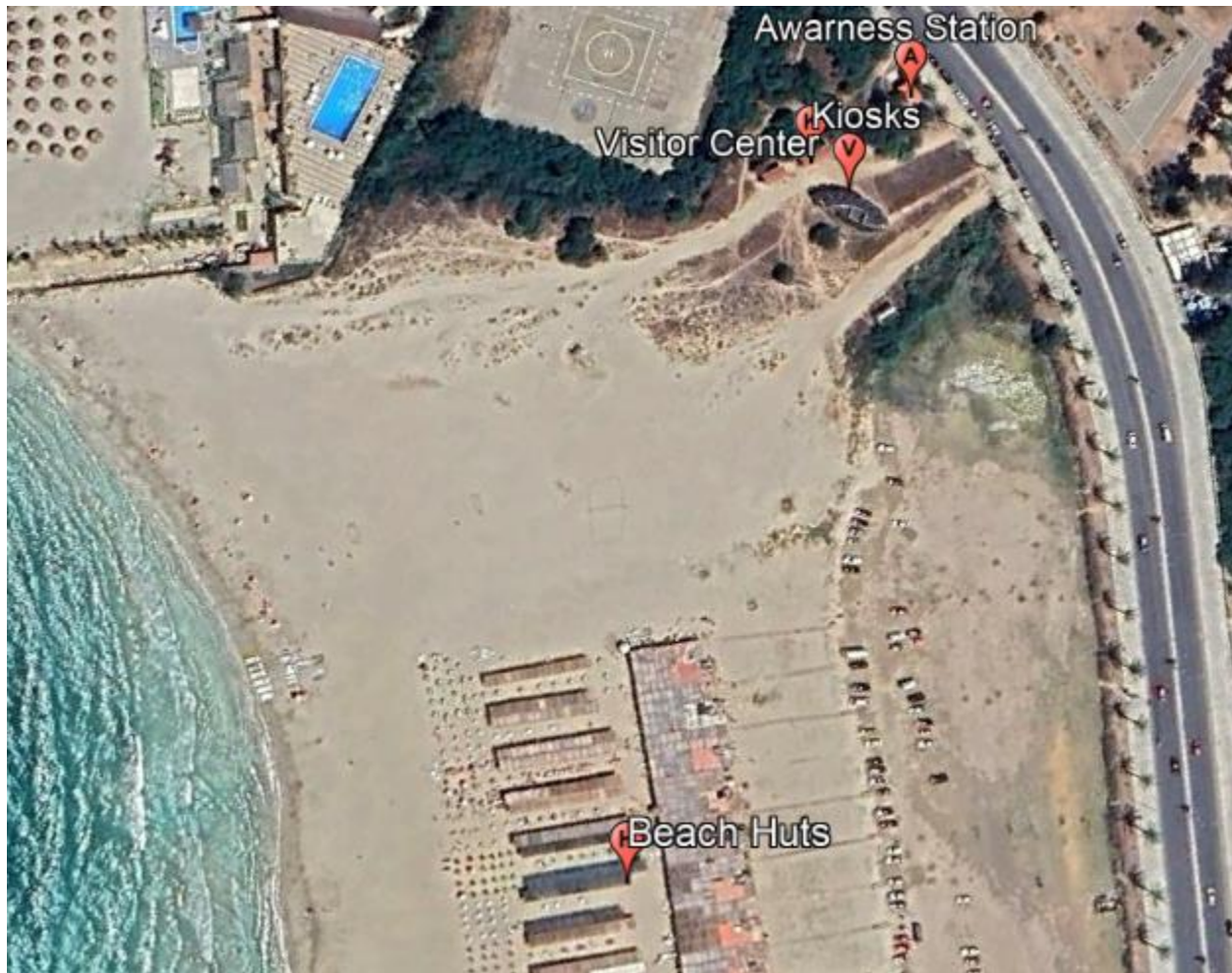


Figure 4.2-1 Map showing the location of different infrastructure at TCNR

1. Visitor Center

A visitor center is located within the TCNR conservation area, serving as the administrative office. It also welcomes visitors to the reserve (Figure 4.2-2), providing information and conducting workshops and trainings for the team (Figure 4.2-3).



Figure 4.2-2 Visitor Center accepting tourists



Figure 4.2-3 Training Session at the Visitor Center



Figure 4.2-4: TCNR Laboratory

2. Ras El Ain Springs

Ras El Ain springs, are one of the most important water sources in Lebanon, located in the middle of the agricultural zone of the TCNR. The springs are artesian in nature and have immediate catchments in the form of ponds. They produce an estimated volume of 10,000 to 15,000 m³/day and feed 7 main reservoirs/ponds serving the greater Tyre area. Four of Ras El Ain Springs are shown in Figure 4.2-5 within the fertile agricultural plain and are identified by their name. Another four springs are located in the vicinity of the Palestinian camp of Rachidieh.

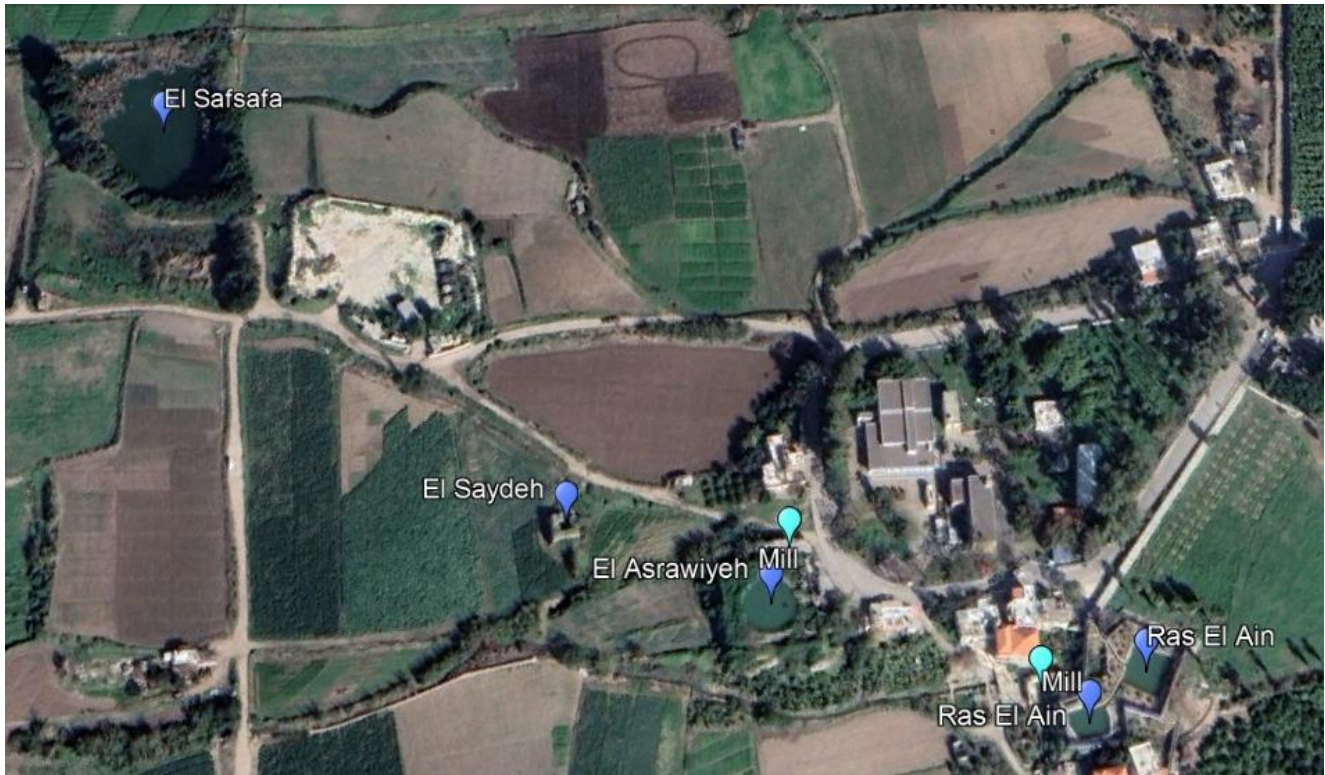


Figure 4.2-5 Map showing the distribution of Ras El Ain Springs

Three of The Ras El Ain springs are under the jurisdiction of the Litani River Authority (LRA). The associated ponds are well fenced and have controlled accessibility limited to LRA staff. The water of these springs is used by LRA for irrigating the coastal plains of Tyre (during the dry months (summer) while during the wet months (winter), extra water is diverted to the sea. Through an extensive network of aqueducts that extends as far south as El Mansouri (about 10 km from Ras El Ain) and as far north as El Abbasieh (about 8 km from Ras El Ain), the springs irrigate 30 km² of fertile land (Badawi, 1997; Badawi, 2018).



El Asrawiyeh

El Saydeh

El Safsafa



Figure 4.2-6: Springs at Ras El Ain

Besides the three ponds that are under the LRA authority, three other springs (Figure 4.2-6) remain for local use, namely: El Asrawiye fenced and one thirds of its water is used by the LRA; El Saydeh spring with the lowest flow is used by the farmers of the reserve; and El Safsafa forms an artificial pool.

A historical water mill (Figure 4.2-5 and

Figure 4.2-77) was constructed next to the El Asrawiyeh basins and has been kept in the same condition as it was described by 19th-century travelers. There is an olive press nearby (Badawi, 2018). Moreover, a second mill was constructed close to Ras El Ain springs.



Figure 4.2-7: Water mill

This site has the potential to become a significant tourist attraction if properly promoted, preserved and protected.

3. Awareness Station

At the southern end of the touristic zone within the Reserve, the awareness station (*Figure 4.2-8*) serves as an educational hub, offering valuable insights into the lifecycle of turtles. The station is equipped with a model that illustrates the various stages of a turtle's life, and highlights some of the threats that sea turtles are facing. This model creates an engaging and informative experience for all who visit. This unique experience has proven to be particularly attractive to students and schools, providing them with an opportunity to deepen their understanding of marine life and environmental conservation. Schools often include visits to the station as part of their educational programs, leveraging the interactive model to instill a sense of environmental stewardship. Beyond educational institutions, the awareness station draws inquisitive visitors eager to learn more about the natural

features and species within TCNR. Its role extends beyond a mere attraction, fostering a sense of appreciation for the delicate balance of marine ecosystems and the importance of protecting these remarkable creatures.

The awareness station not only contributes to the reserve's conservation efforts but also underscores its commitment to sustainable tourism. By promoting awareness and understanding of the local biodiversity, the station plays a vital role in nurturing a community to value and actively participate in the preservation of the Tyre Coast's unique natural heritage.



Figure 4.2-8: Awareness Station



Figure 4.2-9 Awareness event at the awareness station

4. Terrestrial Trail

The Tyre Coast Nature Reserve trails are easy and biodiversity rich trail. Visitors can explore a wilderness area where migratory birds rest on their passage to distant places and where sea turtles lay their eggs on a yearly basis. In addition to the historic Ras Al-Ain artesian wells, there are agricultural fields leading to the estuary. TCNR has constructed trail (Figure 4.2-10) within the scientific zone of the reserve. The trail addresses tourism-related disruptions to sea turtle nests and biodiversity by minimizing the ecological impact of human activity by directing visitors along a designated route. The trail is partly sandy and partly wooden with elevated sections, constructed with a primary focus to protect sea turtle nesting sites and maintain overall biodiversity by reducing soil compaction and vegetation disturbance. This ecologically conscious approach aligns with the principles of sustainable tourism and habitat conservation, demonstrating a scientifically informed strategy to balance public access with the preservation of the reserve's unique ecosystems.



Figure 4.2-10: TCNR Scientific Zone Trail

There are two main entrances to the reserve connected to two trails (Figure 4.2-11):

- 1- Entrance A provides access to the coastal dune ecosystem through the 1st trail (Figure 4.2-10), within the conservation/Scientific zone. This trail has a Length of 1km with average walking time of 30 min, and is classified as easy level. The trail is characterized by dynamic sand formations and a diverse avifauna. It can become an educational trail as well as an observation area for birds, with a bird watching tower (Figure 4.2-12). Birdwatching hides offer vantage points to observe resident and migratory species, and to observe/witness nocturnal sea turtle nesting along the shoreline.

- 2- Entrance B leads to the second trail of the reserve, within the agriculture zone. This path takes visitors past the historic Ras El Ain artesian wells, as well as the area's agricultural fields and freshwater marshes. The trail's length is 1km, with average walking time of 30 minutes and also classified as easy level.

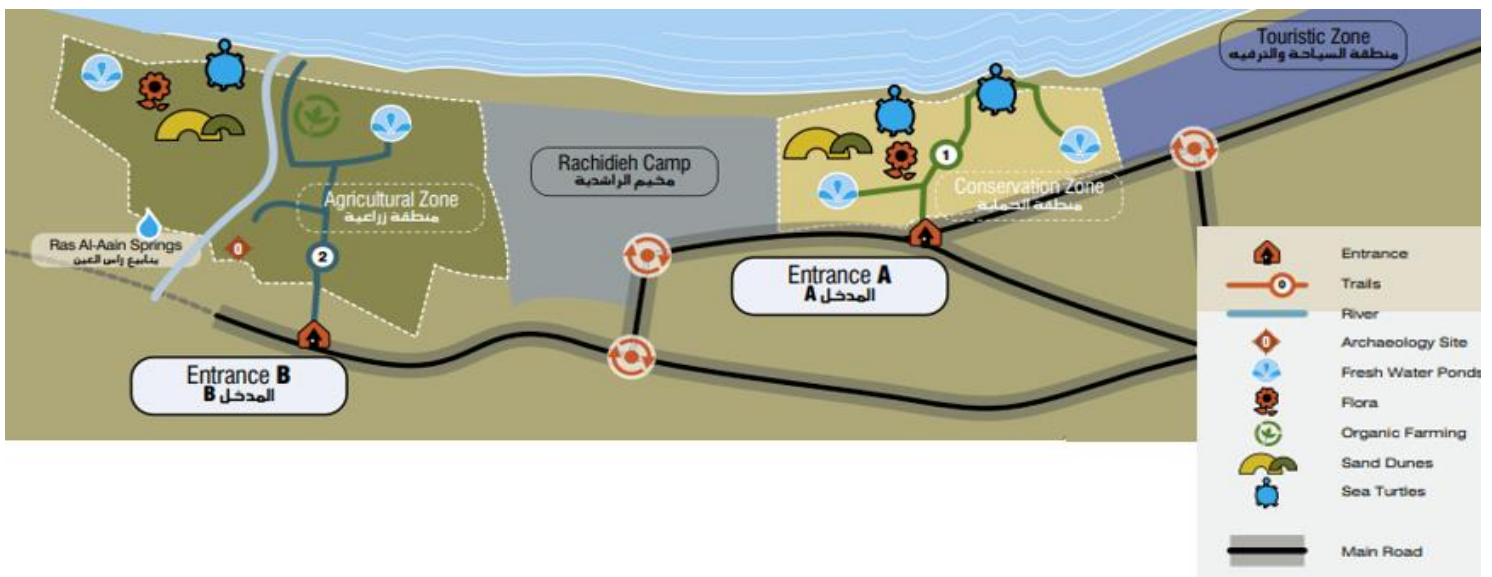


Figure 4.2-11 Map Showing TCNR Trails

Both trails suffer from Weak and lack of systematic maintenance.



Figure 4.2-12 Bird Tour located on the 2nd Trail

5. Marine Trail

The TCNR in partnership with the municipality of Tyre and ARESMAR has set up under the financing of MedPan, the first underwater trail in Lebanon, within the city of Tyre, which is on the UNESCO World Heritage List. It is approximately 1.52 Km away from the visitor center of the reserve (Figure 4.2-13). The Tyre trail is an underwater trail designed to function as both an innovative eco-tourism offering and an educational tool, aimed at increasing awareness of the significance and fragility of the natural and cultural heritage. It provides a secure and easily accessible opportunity for swimmers of all skill levels to explore the submerged historical and marine biodiversity treasures of Tyre waters, all while advocating for eco-responsible behaviors. The trail experience includes provided equipment, guidance, and an informative snorkeling tour. The trail takes tourists through archeological sites, such as an ancient wave breaker, a stone quarry, and fallen columns, with the added possibility of encountering a sea turtle during the excursion. Figure 4.2-15 shows one of many advertisements for snorkeling in Tyre capitalizing on presence of sea turtles.



Figure 4.2-13 Map showing the marine trail's location in relation to the visitor center of the reserve



Figure 4.2-14 Snorkeling trail design



Figure 4.2-15 Advertisement for Snorkeling activities in Tyre

6. Beach Huts

The beach huts, strategically positioned within the tourist zone of the reserve, serve as an attractive service for tourists. Huts are managed directly by the municipality. The municipality decided to decrease the number of kiosks from 100 to 50 (they get thousands of visitors throughout the summer) and to move these kiosks back 60 meters from the wave level during high tide based on beach observation and evaluation, and subsequent negotiations. The kiosks present a share of disturbances, especially through light in the night. The TCNR is working with the municipality to better address and mitigate the disturbances. Beyond their role as a beachside attraction, these huts function as a revenue stream for the municipality and, indirectly, contribute to the financial sustainability of the reserve (Figure 4.2-16).



Figure 4.2-16: Light disturbance during the sea turtles nesting season coming from the beach kiosks

7. Wooden Kiosk

Too empty wooden shacks/kiosks and a toilet room are situated within the scientific zones close to the Awareness Station and are not actively utilized (Figure 4.2-17). One of the kiosks is periodically used to house stray dogs.

These kiosks are parts of the new design of the visitor center that can be repurposed as accommodation or stock rooms for research endeavors (Figure 7.2-1).



Figure 4.2-17: Wooden Kiosk

4.3. Evaluate the Environmental Impacts of Tourism in Tyre

The sandy beaches and archaeological monuments of Tyre are popular tourist destinations, attracting thousands of visitors each year. However, several of these attractive places, including sandy beaches, coastal wetlands, and the TCNR, are deemed vulnerable (TCNR). Because these locations are regularly frequented, particularly during the summer, uncontrolled recreational activities such as unregulated fishing, jet skiing, boating, snorkeling, scuba diving abound, and are causing disturbances.

More disturbances are caused by visitors trampling and damaging turtle nests, the insular vegetation, the freshwater vegetation, and the plants that stabilize dunes at the reserves (MoE/UNEP/ UNDP, 2013). Another main concern is the disturbance of vermetid platforms across the Lebanese coast (Badreddine et al., 2018; Badreddine et al., 2019) by the tourism sector. Another possible danger is the trampling of visitors and fishermen, which may impair vermetid recruits' survival and settlement success (Milazzo et al., 2017), as well as the associated benthic ecosystems (Milazzo et al., 2004; Milazzo and Ramos-Esplá, 2000).

A Sand Dunes ecosystem is in the conservation zone of the reserve, with well-established relative vegetation. *Astragalus berytheus* which is one of the most threatened taxa in Lebanon (MOE, 2004) occurs in prime tourist areas, such as the sandy beaches of Tyre, which are targeted for the establishment of resorts. These habitats are categorized as highly threatened because of extensive tourism throughout the Mediterranean (IUCN, 2012).



Figure 4.3-1: Tyre Beaches in Summer

The main roads connecting the tourist destination areas host many restaurants, nightclubs, and coffee shops that are sources of impact through noise, solid and liquid waste, and lights at night (MoE/UNEP/UNDP 2013). Night lights from the beach huts in the reserve lead to a considerable decrease in the potential of marine turtles nesting on sandy beaches and pollution debilitates marine organisms and reduces survival capacity. In the marine environment, the main problems are also caused by water activities such as over-frequented by divers, jet skis, and recreational boats.

Tourism increases human presence in the region and this will increase the pollution resulting from any other industry noise, increased solid waste and littering, releases of sewage, oil, and chemicals; Air emissions from increased cars usage increase air pollution. An EIA study conducted in Tyre showed that Awqaf square and Hamra (Hiram) Street, located 3 Km north west the reserve, suffer from PM10 concentrations exceeding the limits (CDR, 2009). This exceedances in suspended particles was attributed to the high traffic congestion at the square (two-way streets) during peak commercial activity time in the morning and noon-time and during night-time. Similarly, the ambient noise level exceeded the Lebanese maximum allowable noise limit standards (UN Habitat, 2017).

Unmanaged solid waste management also leads to an increase litter in the touristic zone of the reserve. The marine litter project showed 72 times higher than the European beach litter threshold stated in the EU sciences hub (2020) value set at 20 items. Plastic and polystyrene, paper and cardboard, as well as metal, emerged as notable components of beach litter. The presence of paper and cardboard are the direct result of recreational activities that are being conducted such as picnics and food consumption at the beach. The prevalence of metal items, while relatively consistent between seasons, which could be attributed to various sources including beverage containers, packaging, and discarded items from beachgoers.

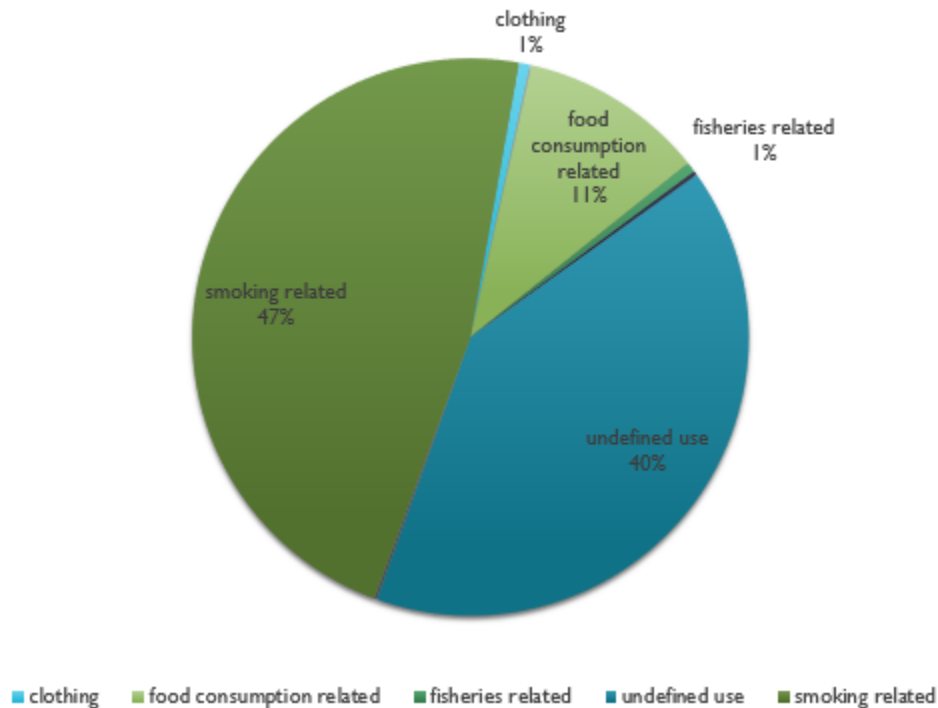


Figure 4.3-2: Types of Marine Litter found on the beaches of TCNR

The analysis of litter density across seasons reveals a noteworthy trend—the dry season exhibits a substantially higher litter density compared to the wet season. This disparity is attributed to heightened human activity during the summer months, resulting in a more significant accumulation of litter along the coast.

Seasonality of tourism makes the city very concentrated in human presence during the summer season, exerting high pressure on the city's infrastructures, the reserve's ecosystems, and eventually its biodiversity. Some touristic activities cause wildlife disturbance to the biodiversity of Tyre's reserve.

The number of visitors during the beach season exceeds the carrying capacity of the touristic zone in the reserve. It extends beyond the area covered by the Ministry of Environment's 50 permitted kiosks (temporary hut-restaurants) to both sides (northern and southern sides of the beach uncovered by the kiosks' services) by independent tourists who do not follow the eco-rules imposed on the kiosk owners exploiting the beach during the summer.

Uncontrolled Recreational Activities Seashore destinations witness the largest mass of tourism. They are often frequented by visitors during the summer season (mainly May-September) resulting in

uncontrolled recreational activities. Also, sensitive ecosystems such as sandy beaches and coastal wetlands are attractive to tourists, developers, and residents. Increasing numbers of tourists to natural, well-conserved sites such as the TCNR constitutes a major concern. The disturbances caused by visitors include trampling, noise and littering, damaging turtle nests, the unique insular vegetation, the unique freshwater vegetation, and the special plants that stabilize dunes at the reserves (MoE/UNEP/ UNDP, 2013).

The growing tourism sector also causes intensive urban development along the coast. It is mainly based on activities within urban structures such as beach resorts, hotels, restaurants, and country clubs. This traditional trend of Lebanese tourism has a destructive impact on the environment. The unregulated construction of coastal resorts and the violation of the Maritime Public Domain have resulted in coastal privatization, beach erosion, and land and ecosystem degradation.

4.4. Visitors Survey Findings

The survey primarily involved Lebanese respondents, with a significant majority (88.9%) residing outside of Tyre. For the optimal period to visit Tyre, the majority (69.2%) recommended the summer season, attributing their preference to favorable weather conditions, while other seasons received comparatively lower recommendations (23.1% winter, 61.5% spring, and 23.1% fall) (Figure 4.4 1).

Key destinations frequented by respondents included the Tyre Coast Nature Reserve (TCNR) (27.27%), various churches (18.18%), historical ruins (54.54%), sandy beaches (45.45%), Tyre city (18.18%), Tyre port (18.18%), Tyre old souk (27.27%), necropolis (9.09%), and the "Rest House" hotel (9.09%). Noteworthy activities mentioned were swimming (61.5%), exploring the nature reserve (53.8%), visiting archaeological sites (84.6%), diving (7.7%), and exploring churches and souks (7.7%) (Figure 4.4 2).

While a significant proportion enjoyed Tyre's beaches (83.33%), a noteworthy observation was that 83.33% did not actively participate in beach activities. Significant visits were made to the reserve (66.7%) and archaeological sites (83.3%). Respondents generally found navigation clear (63.6%) and expressed a high sense of safety (91.7%) in Tyre. Furthermore, respondents found it easy to communicate with the local community (100%).

Accommodation satisfaction stood at 62.5%, with specific commendation for Fanar Inn and the "Rest House" hotel. Local transportation was considered easy by 81.8%, though a minor challenge (8.3%) was identified, suggesting a potential need for a tourist information center or guide.

Recommendations for sustainable tourism encompassed integrated plans covering all zones of TCNR (Touristic Zone, Agriculture Zone Ras El Ain, and the Scientific Zone), awareness campaigns, local

community engagement through workshops and training, expanded advertising (especially on social media), investment in ecotourism, and utilization of Toctoc for transportation.

In summary, a significant majority (91.7%) expressed positive experiences and an intention to return to Tyre for tourism purposes, underscoring the potential for further growth and development in the region.

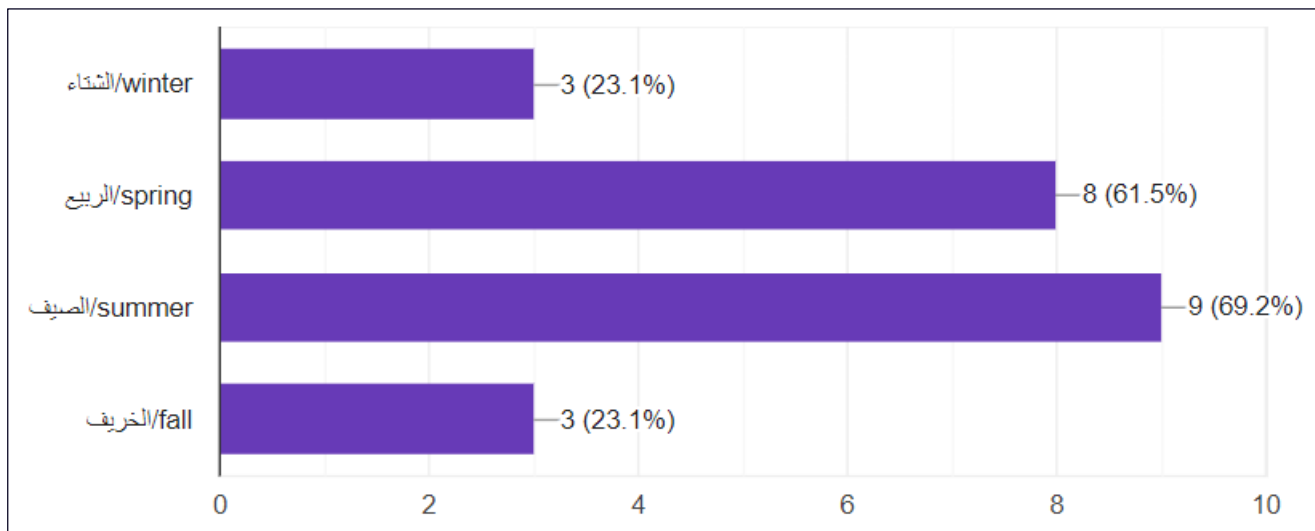


Figure 4.4-1: Best Period to Visit Tyre

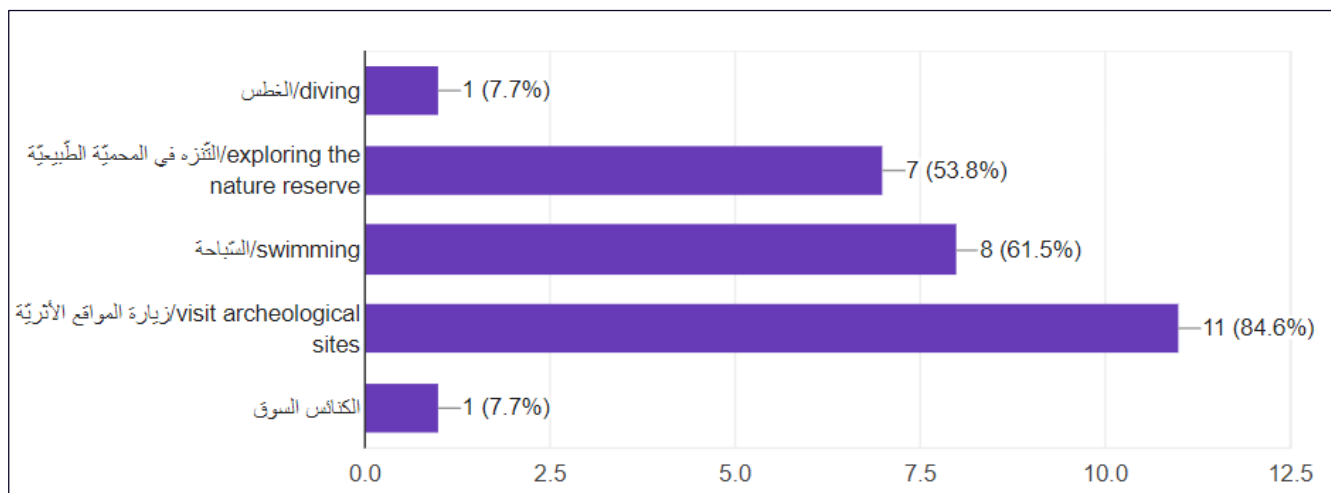


Figure 4.4-2: Most Excited Activities in Tyre

5. Assessment of Tourism Sector in TCNR

This section uses tourism-focused SWOT analysis to provide insights into the specific strengths, weaknesses, opportunities, and threats for each infrastructure within the Tyre Coast Nature Reserve from the perspective of attracting and serving tourists.

Table 1 SWOT Analysis for TCNR Tourism Infrastructure

	Ras El Ain Springs	Awareness Station	Terrestrial Trail	Marine Trail	Beach Huts	Research laboratory	Wooden Kiosks
Key Strength	- Historical water mills and the archeological ponds can attract history and culture enthusiasts. - The springs' location in the fertile plain adds to the overall scenic appeal for tourists. - Offers insights into traditional water management systems.	-Attracts tourists interested in marine life and environmental conservation. -Family-friendly, as it offers an informative experience for both adults and children. -Fosters a sense of environmental responsibility among tourists.	- Appeals to nature enthusiasts and birdwatchers	- Unique Underwater Experience Appeals to snorkeling and marine enthusiasts. - Offers insights into submerged historical and marine biodiversity treasures. - Suitable for swimmers of all skill levels.	- Strategic location within the tourist zone attracts visitors. - Contributes to the financial sustainability of the reserve.	-Provides educational experiences and promotes marine conservation. - Aligns with the growing trend of ecotourism	-Can be repurposed for accommodation or research endeavors
Key Weakness	-Uncontrolled access may affect the cleanliness and overall integrity. -Different springs under different authorities may create coordination challenges for tourism management.	-Reliance on school programs may limit year-round tourism. -May not attract diverse tourist demographics.	- Current maintenance problems may impact the overall tourist experience.	- Dependent on weather conditions, limiting availability during certain seasons	- Dependency on summer visitors may make the revenue stream seasonal. - Decreasing the number of kiosks may impact revenue and visitor satisfaction.	- Shortage of Expertise in sea turtle rescue may limit impact	- Not actively utilized, one serving as temporary shelter for stray dogs

Key Opportunities	- Proper promotion can attract history, culture, and nature-oriented tourists. -Introduction of guided tours to explain the historical and cultural significance.	- Organize events to attract tourists beyond the academic calendar. - Develop more interactive programs to enhance the tourist experience.	-Address maintenance issues to improve the trail's attractiveness. -Guided tours for a more informative experience.	-Expand educational programs to increase awareness. - Add more features or routes to enhance the overall trail experience.	- Improving services and offerings at the beach huts. - Partnering with local businesses for mutual benefit.	-Collaborate with experts and organizations to address the shortage. -Use the laboratory for campaigns promoting marine conservation.	-Conversion into accommodation facilities for tourists or researchers. -Partnering with local animal shelters for responsible use of space.
Key Threats	- Potential risk of over-tourism if not managed properly. - Tourism may impact the natural environment and historical structures.	-Ensuring exhibits and information stay relevant and up-to-date.	- Even with designated trails, human activity may impact biodiversity. -Vulnerable to weather events affecting trail conditions.	- Potential for negative environmental impact if not managed responsibly. - Ensure proper safety measures during snorkeling activities.	- Facing competition from other beachside attractions in the region. - Environmental threats from light to sea turtles	-Limited resources may hinder expansion and effectiveness. -Negative publicity regarding sea turtle rescue efforts may impact public support.	- Lack of use and maintenance may lead to decay and structural issues. -Negative public perception if kiosks are not repurposed effectively.
Possible Strategic Actions	- Develop and implement targeted promotional campaigns to attract history, culture, and nature enthusiasts. - Invest in a visitor center near Ras El Ain Springs to provide information, guided tours, and educational materials. - Work closely with local authorities to streamline	-Expand educational programs beyond school curriculums to attract a broader range of tourists. -Organize year-round events and workshops at the Awareness Station to maintain a steady flow of visitors. -Leverage online platforms to promote the station, reaching a wider audience.	- Establish a regular maintenance program to address trail issues and ensure a positive visitor experience. - Introduce guided tours led by knowledgeable guides to enhance the educational aspect of the trail.	-Offer extended snorkeling programs, including educational components and expert-guided tours. - Implement a weather monitoring system to provide accurate information to tourists regarding the suitability of snorkeling activities.	- Enhance services at beach huts, including food quality, seating arrangements, and overall customer experience. - Partner with local businesses to offer a variety of services and products at the beach huts.	- Actively recruit and collaborate with experts in sea turtle rescue and conservation. -Integrate the laboratory into educational tourism programs to	- Develop a clear plan for repurposing the wooden kiosks, considering accommodation facilities, research storage, or other relevant uses.

	accessibility and coordinate efforts for tourism development. - Implement preservation programs to ensure the historical and natural aspects of the springs are protected.	-Integrate interactive technology, such as virtual reality, to enhance the educational experience.	- Involve local communities in the maintenance and preservation efforts. - Use technology, such as trail apps, to provide real-time information and enhance the visitor experience.	-Promote and enforce eco-friendly snorkeling practices to minimize environmental impact. - Install informative signage along the trail to educate snorkelers about the marine environment.	- Organize seasonal events and festivals to attract more visitors during peak times. -Introduce eco-friendly practices in the management of beach huts to align with modern sustainability expectations.	increase its visibility and impact. - Seek grants and partnerships to secure additional funding for expanding and upgrading the laboratory.	-Engage with the local community to gather input and support for repurposing initiatives. - Ensure regular maintenance of the kiosks to prevent decay and deterioration.
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6. Guidelines for Sustainable Tourism in Nature Reserves

Sustainability in tourism has three interconnected components, just as it does in other industries: environmental, socio-cultural, and economic; sustainability implies permanence, so sustainable tourism includes optimum use of resources, including biological diversity, minimization of ecological, cultural and social impacts, and maximization of benefits to local communities. Sustainability also refers to the management structures that are needed to achieve this.

To ensure sustainable tourism in nature reserves, it's crucial to implement a comprehensive set of strategies and actions based on the provided information. Here's a detailed guide provided by the ministry of tourism of Lebanon incorporating the key elements mentioned:

6.1. Integration of Tourism into Overall Policy for Sustainable Development

1. Tourism Strategy plan

The management team of the reserve should establish and regularly update a master plan for tourism development and management of the reserve, integrating conservation of environmental and biodiversity resources into these plans; in addition, the team should explore the possibility of recruiting individuals to actively contribute to enhancing economic development and employment opportunities within the reserve.

2. Interagency coordination and cooperation

The team should promote coordination among agencies, authorities, and organizations, strengthen local authorities' role in tourism management, and involve all stakeholders in the development and implementation of tourism plans, while balancing tourism with other economic activities and natural resource uses in the area.

3. Integrated management

To promote sustainable land use and ecological restoration, it's crucial to adopt integrated management approaches that cover all economic activities, with a focus on tourism. Comprehensive restoration programs in damaged areas are also essential. This approach maximizes benefits across economic, social, and environmental dimensions while minimizing adverse effects. Balancing human activities with ecosystem preservation is essential for the long-term well-being of natural environments and local communities.

4. Reconciling conflicting resource uses

Efficient conflict resolution is crucial for sustainable development, involving early identification and resolution of conflicts between tourism and other activities. This proactive approach involves active

stakeholder engagement in developing sound management plans and fostering collaboration among diverse stakeholders, including the tourism industry and local communities.

6.2. Development of Sustainable Tourism

1. Planning for development and land-use

To ensure sustainable tourism development, it's crucial to integrate tourism planning into broader development plans, focusing on sustainable use of natural resources and land. This holistic approach fosters responsible and enduring growth by synchronizing tourism initiatives with overarching development objectives, promoting responsible and sustainable growth in short, medium, and long-term.

An example would be:

1. Short-Term Initiatives (1-2 years):

- Visitor Education Programs: Implement guided tours and educational programs to raise awareness about the reserve's flora and fauna, emphasizing the importance of conservation.
- Infrastructure Improvement: Upgrade existing trails and facilities to accommodate visitors, ensuring minimal impact on sensitive habitats.

2. Medium-Term Initiatives (3-5 years):

- Community Engagement: Establish partnerships with local communities to involve them in tourism activities, such as guided tours or artisan markets, creating opportunities for sustainable income.
- Visitor Monitoring Systems: Implement systems to monitor visitor numbers and behavior to ensure adherence to environmental guidelines.

3. Long-Term Initiatives (Beyond 5 years):

- Eco-Friendly Accommodations: Explore the possibility of developing eco-friendly accommodations within the reserve, designed to minimize ecological footprint and operate sustainably.
- Research and Conservation Fund: Allocate a portion of tourism revenue to a research and conservation fund, supporting ongoing scientific studies and habitat restoration projects.

2. Environmental impact assessment (EIA)

Comprehensive Environmental Impact Assessments (EIAs) are crucial for protecting a nature reserve's ecological integrity during tourism development. These assessments evaluate all tourism programs, Anticipate and address cumulative effects from multiple development activities.

3. Planning measures

To ensure the sustainable balance between tourism and environmental preservation, it is imperative to implement effective carrying capacity programs and planning controls. This involves closely monitoring and controlling tour operators, tourism facilities, and tourists within the area, preventing overuse that could harm the natural ecosystem.

Additionally, zoning of both land and marine territories is crucial to minimize environmental impact. By adopting strategic planning measures, such as reducing emissions, controlling pollution, and minimizing waste generation, the aim is to protect the delicate ecological balance of the region while allowing for responsible and sustainable tourism practices.

6.3. Legislation and Standards

1. Legislative framework

A flexible legal framework is crucial for sustainable tourism development in nature reserves. This allows destinations to create their own rules and regulations, based on their unique ecological characteristics and conservation needs. This empowers local communities and authorities to take ownership of tourism management, promoting responsibility for preserving natural assets.

2. Environmental standards

To minimize environmental impact in nature reserves, strategies like waste minimization, recycling, and effluent treatment should be implemented. These measures prevent pollution of air, water, and soil. Reducing emissions, particularly CO₂ and other greenhouse gases, is crucial for combating climate change. By integrating sustainable waste management practices and reducing carbon emissions, nature reserves can remain pristine and support diverse flora and fauna for future generations.

6.4. Management of Tourism

1. Initiatives by industry

Encouraging collaboration among stakeholders, including local communities, establishes a collective commitment to preserve the reserves ecosystems. By involving local communities in the ownership and benefits of tourism projects, this ensures a sense of shared responsibility and empowers those directly connected to the reserves, contributing to sustainable practices that prioritize environmental well-being.

To enhance the success of initiatives within nature reserves, it is essential to establish clear responsibilities, boundaries, and timetables. This clarity facilitates effective coordination among various stakeholders and aids in the seamless implementation of conservation strategies. Additionally, providing support to small and medium-sized enterprises engaged in sustainable tourism initiatives ensures that these businesses play a crucial role in promoting environmentally friendly practices, ultimately benefiting both the local economy and the long-term health of the nature reserves.

2. Monitoring

Maintaining consistent monitoring is essential for promoting sustainable tourism practices within nature reserves. This involves continuous evaluation and review of tourism activities to promptly detect and prevent potential issues that may arise. Furthermore, establishing clear indicators for measuring overall progress toward sustainable development ensures a comprehensive understanding of the impact of tourism on the reserves.

3. Technology

Embracing environmentally sound technologies (ESTs) is pivotal for sustainable tourism within nature reserves. By minimizing resource use and pollution through the adoption and promotion of ESTs, it can ensure that tourism activities have minimal impact on the delicate ecosystems. Additionally, encouraging the use of renewable energy and ESTs in tourism facilities and infrastructure aligns with a commitment to environmental responsibility.

6.5. Conditions for Success

1. Involvement of stakeholders

By engaging primary stakeholders in both the planning and implementation phases, it is crucial to ensure a more comprehensive understanding of the unique needs and concerns associated with the reserves. Moreover, fostering development partnerships with shared responsibilities encourages a collaborative approach among stakeholders, including local communities and businesses. This inclusive strategy not only promotes a sense of ownership but also strengthens the overall resilience and sustainability of tourism initiatives.

2. Information exchange

Elevating awareness for sustainable tourism within nature reserves is essential and can be achieved through effective information exchange. By disseminating information, it will be possible to educate various stakeholders about the importance of responsible tourism practices. Additionally, fostering dialogue on best practices and creating networks dedicated to sustainable tourism implementation encourages the exchange of valuable insights and experiences.

3. Capacity building

Achieving effective implementation of sustainable tourism practices within nature reserves necessitates comprehensive capacity building. This involves the implementation of robust programs aimed at enhancing the skills and capabilities of both human resources and institutions involved in managing tourism within these sensitive areas. Simultaneously, transferring knowledge and providing training for sustainability in tourism ensures a well-equipped and informed workforce. To support this effort, encouraging contributions to capacity-building from local, national, regional, and international

levels is crucial. Furthermore, facilitating assistance for countries that have not yet implemented sustainability mechanisms ensures a global collaborative approach to safeguarding the ecological health of nature reserves through responsible tourism management.

By incorporating these strategies, a comprehensive and sustainable approach to tourism development in nature reserves can be achieved, balancing economic, social, and environmental objectives.

7. Recommendations

7.1. Recommendations according to the management plan

The TCNR management plan suggests the following steps to reinforce the tourism sector in the reserve:

1. Develop a Visibility and Communication Strategy for TCNR:

In order to reinforce the visibility and communication of TCNR, a comprehensive strategy has been outlined. This involves the creation of a distinct communication sign, updating the reserve's website, formulating a promotion plan, producing a promotional video, and fostering partnerships with educational institutions, restaurants, and hotels to effectively promote TCNR.

2. Develop a Visitor Management Plan:

A visitor management plan has been proposed to enhance the overall experience within TCNR. This includes conducting surveys of visitor profiles, implementing differentiated entrance fees, regulating kiosks and interpretative signs, calculating and enforcing carrying capacities for various zones, overseeing activities in public spaces, and establishing a customer experience department. Security measures, such as CCTV installations, increased ranger presence, and visitor feedback mechanisms, aim to ensure responsible tourism practices.

3. Enhance and Expand Eco-Touristic Activities in TCNR:

Aiming to enrich eco-touristic offerings, TCNR plans to conduct feasibility studies for an eco-friendly camping site and invest in new sustainable water sports activities. Staff mobilization, guidelines for equipment use, rehabilitation of the visitor information center, and expanded collaboration with tour operators and educational institutions contribute to a more immersive and educational visitor experience.

4. Implement a Tourism Marketing Strategy:

To attract a wider audience, a comprehensive tourism marketing strategy has been developed. This includes marketing campaigns targeting both national and international visitors, website enhancements for online booking, the establishment of an on-site souvenir store, and agreements with neighboring hotels and diving centers. These agreements include adding percentage fees as revenue for TCNR, while also mandating information dissemination about the reserve within their establishments.

7.2. Stakeholder's recommendations

These recommendations are derived from discussions with the site manager, Dr. Ali Badreddine, and ADR representative, Hiba Fawaz. Their recommendations for enhancing the touristic sector in the reserve included:

1. Communication and Engagement:

- Hire a dedicated social media communicator to improve online presence and engagement.
- Open volunteering opportunities during the summer to encourage community involvement.
- Establish collaborative agreements with the Lebanese University to foster academic contributions.

2. Visitor Facilities:

- Propose constructing two buildings with meeting rooms, a closed room for turtle monitoring, and a guest house on the sandy beach boundary to enhance visitor facilities.
- Provide essential equipment for bungalows near the reserve to improve accommodation offerings.
- Develop a dedicated bungalow for turtle observation to enhance educational experiences.



Figure 7.2-1 Proposed design of the visitor house

3. Tour Experiences:

- Encourage boat tours beyond the reserve boundaries, incorporating fishing activities during tours to generate financial support for both fishermen and the reserve.
- Create organized tour groups within and around the reserve to address the low tourist operator contact in Tyre.
- Implement a permission system for access to the reserve to ensure effective management.

4. Educational Initiatives:

- Install infrared cameras for turtle and bird observation in the closed scientific region.
- Build relationships with schools and universities to enhance educational programs on species surveillance.

- Seek contributions from private schools to support educational programs and conservation initiatives.

5. Sustainability Practices:

- Implement signage and training for farmers in the agricultural region on sustainable practices to boost tourism.
- Emphasize the management plan, promoting the cultivation of agricultural lands with vegetables for tourists to create their organic salads.
- Focus on specific plantations in the freshwater region, guiding cultivation practices with an emphasis on quality control.
- The reserve took steps to reduce human pressures coming from kiosks, especially during summer, by signing an agreement focusing on reducing light, especially during sea turtle nesting season.

6. Collaboration and Partnerships:

- Seek funding for the restoration of archaeological sites in Ras El Ain to preserve historical heritage.
- Foster cooperation with touristic establishments (inns, hotels, venues, restaurants...) for improved communication and collaboration with TCNR, creating a positive impact on the overall tourist experience.

These integrated recommendations aim to enhance the touristic sector in TCNR by promoting engagement, improving facilities, enriching tour experiences, emphasizing education, encouraging sustainability practices, and fostering collaboration.

7.3. Convention with tourism facilities in Tyre city

A proposed collaborative effort to boost sustainable tourism can be done by linking the TCNR nature reserve with nearby hotels and restaurants. The idea is to create a continuous experience that combines exploring the reserve's diverse ecosystems with enjoying top-notch hospitality, all wrapped in an environmentally friendly package.

Exploring the reserve through eco-friendly events and activities, would be completed by a hotel room or restaurant experience themed around the local flora and fauna. This collaboration would benefit both parties: the reserve gains awareness and funding, while the hospitality industry attracts eco-conscious tourists.

This approach goes beyond just offering nature walks and hotel stays. It's about crafting a complete, immersive experience that showcases Tyre's natural beauty and promotes responsible tourism. This could make Tyre a leader in destination management, where conservation and hospitality thrive together in a mutually beneficial cycle.

Synergistic collaboration to Enhance TCNR Tourism Through Strategic Hotel Collaborations:

These are few ideas that can feed into a signed convention between the two parties:

1. Turtle Logo Integration:

- *Concept:* Incorporate a distinctive turtle logo associated with the nature reserve in the branding and promotional materials of participating hotels. The turtle symbolizes environmental conservation, aligning with the reserve's mission.
- *Implementation:*
 - Encourage hotels to display the turtle logo prominently in their signage, websites, and marketing materials.
 - Offer a unique turtle-themed amenity in hotel rooms to create a memorable connection between the stay and the reserve.

2. Promotional Collaborations:

- *Concept:* Establish a mutual promotional strategy where hotels actively promote the nature reserve, and in return, the reserve supports the hotels' awareness campaigns.
- *Implementation:*
 - Hotels can include information about the nature reserve in guest welcome packets, emphasizing its unique features and the importance of conservation efforts.
 - The reserve, in turn, can promote hotel packages and discounts to its audience, encouraging visitors to stay at these establishments.

3. Special Packages and Discounts:

- *Concept:* Create exclusive packages that combine hotel stays with nature reserve experiences, offering visitors an integrated and cost-effective way to enjoy both aspects.
- *Implementation:*

- Develop joint promotional materials highlighting special packages, such as "Stay and Explore" bundles that include guided reserve tours or wildlife-themed activities.
- Provide discounted entry to the nature reserve for hotel guests, further incentivizing them to explore the natural surroundings.

4. Utilizing Hotel Spaces for Awareness Events:

- *Concept:* Enhance the reserve's awareness initiatives by utilizing hotel spaces for events, presentations, or workshops.
- *Implementation:*
 - Reserve staff could organize occasional awareness events in hotel conference rooms or common areas, educating guests about local ecosystems, wildlife conservation, and sustainable practices.
 - Hotels may benefit from increased foot traffic and positive publicity by **associating with these educational events.**

5. Coordinated Social Media Campaigns:

- *Concept:* Leverage social media to cross-promote both the nature reserve and hotels, creating engaging content that highlights the unique experiences offered by each.
- *Implementation:*
 - Encourage guests to share their experiences on social media using specific hashtags that represent the collaboration.
 - Feature joint campaigns showcasing behind-the-scenes glimpses of the reserve and the hospitality facilities, fostering a sense of connection between the two.

6. Feedback Mechanisms:

- *Concept:* Establish a feedback loop where both the nature reserve and hotels actively seek input from visitors, allowing continuous improvement of the collaborative experience.
- *Implementation:*
 - Collect feedback through surveys or digital platforms to gauge visitor satisfaction with the integrated offerings.
 - Use the insights gained to refine promotional strategies, enhance collaborative events, and address any concerns raised by visitors.



By implementing the presented ideas, the convention can attract more visitors to the nature reserve and create a mutually beneficial relationship between the reserve and the hospitality facilities, enriching the overall tourist experience.

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Annex 1

Annex 2