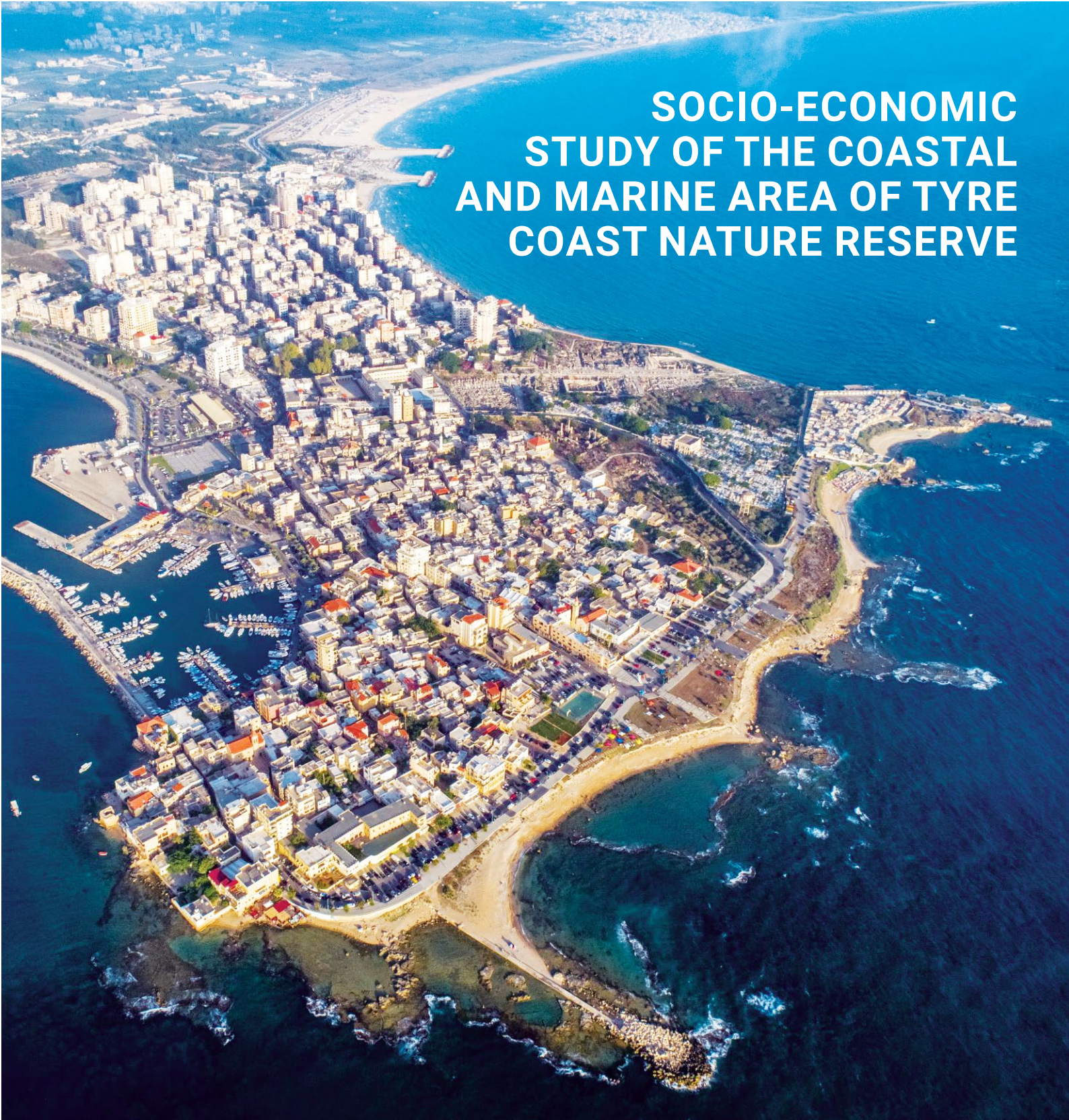




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# SOCIO-ECONOMIC STUDY OF THE COASTAL AND MARINE AREA OF TYRE COAST NATURE RESERVE

With the financial  
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# **SOCIO-ECONOMIC STUDY OF THE COASTAL AND MARINE AREA OF TYRE COAST NATURE RESERVE**

**Study required and financed by:**

## **IMAP-MPA Project**

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## LIST OF ACRONYMS

<b>ADR</b>	Association d'Aide au Développement Rural
<b>CCA Coalition</b>	Climate & Clean Air Coalition
<b>CDR</b>	Council for Development and Reconstruction
<b>CRI</b>	Consultation and Research Institute
<b>DMO</b>	Destination Management Organization
<b>DPSIR</b>	Driving forces, Pressure, State, Impact, Response
<b>FGDs</b>	Focus Group Discussions
<b>GAF</b>	Gender Analysis Framework
<b>IUCN</b>	International Union for Conservation of Nature
<b>KAP</b>	Knowledge Attitude Practices
<b>KIIs</b>	Key Informant Interviews
<b>MedMPAnet</b>	Regional Project for the Development of a Mediterranean Marine and Coastal Protected Areas (MPAs) Network through the boosting of MPA creation and management
<b>MoA</b>	Ministry of Agriculture
<b>MoC</b>	Ministry of Culture
<b>MoE</b>	Ministry of Environment
<b>MoEW</b>	Ministry of Energy and Water
<b>MoF</b>	Ministry of Finance
<b>MoIM</b>	Ministry of Interior and Municipalities
<b>MoPWT</b>	Ministry of Public Works and Transport
<b>MoT</b>	Ministry of Tourism
<b>MPA</b>	Marine Protected Area
<b>NGOs</b>	Non- Governmental Organizations
<b>NPMPPLT</b>	National Physical Master Plan of the Lebanese Territories
<b>PRA</b>	Participatory Rapid Appraisal
<b>SPA/RAC</b>	Specially Protected Areas Regional Activity Centre
<b>SPAMI</b>	Specially Protected Area of Mediterranean Importance
<b>TCNR</b>	Tyre Coast Nature Reserve
<b>TYM</b>	Tyre Union of Municipalities
<b>UN</b>	United Nations
<b>UNDP</b>	United Nations Development Programme
<b>UNEP/MAP</b>	United Nations Environment Programme / Mediterranean Action Plan
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>UNRWA</b>	United Nations Relief and Works Agency
<b>VC</b>	Value Chain

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## 1. EXECUTIVE SUMMARY

The socio-economic study aims to

- (i) provide guidance to local, national and international stakeholders involved in the management of the Tyre Coast Nature Reserve (TCNR) and
- (ii) assist them in planning for and adopting a sustainable management system for this nature reserve as one of the Marine Protected Areas (MPAs) network in Lebanon, as clearly stated by the Strategy of MPAs in Lebanon.

The study methodology is based on mixed methods combining quantitative and qualitative data collection and analysis, in addition to a secondary data review. The Participatory Rapid Appraisal (PRA) methodology was used to collect primary data through Key Informant Interviews (KIIs) and a Knowledge Attitude Practices (KAP) survey. A total of 16 Key Informant Interviews (KIIs) were conducted with key local and national stakeholders and organizations involved in coastal and marine resources management, TCNR management, and local livelihoods and economic sectors with a focus on fisheries and tourism. For the KAP survey, a total of 81 respondents, who filled the questionnaires prepared and shared for the study purpose, were divided into four community groups living in the TCNR area:

- 1) Fishermen and fisheries operators,
- 2) Tourism service providers and professionals,
- 3) Farmers, and
- 4) Households.

The collected data were analyzed through:

- a) Conceptualization, coding, and categorization of the collected information;
- b) Content analysis to identify and highlight notable results;
- c) Trend analysis to examine relationships between local economic sectors and to understand the perception of different community groups in terms of coastal and marine areas resources management and use; and
- d) Quantitative and qualitative data analysis for the KAP survey.

From field work results and the secondary review consisting of reviewing and analyzing the existing literature about TCNR and Tyre city (reports, studies,

articles, projects documents, laws and regulations), the environmental state of Tyre including TCNR is still good and rich in terms of biodiversity. The reserve is important for birds and as a nesting site for sea turtles and it is the last remaining sand dunes ecosystem site in Lebanon. Despite this, the marine biodiversity and the fish stocks are decreasing and endangered due to illegal fishing, which is still practiced and due to pollution and overfishing.

The tourism sector is the main contributor to local economic development with Tyre being the top destination for Lebanese until the end of 2021 according to a recent study on domestic tourism in Lebanon<sup>1</sup>. However, the state of the tourism infrastructure shows that there is a lack of signs introducing people to the reserve, and there is a lack of coordination between the different sectors' actors. As for the fishing sector, there is no wholesale market for the fisheries, and the two legal entities who represent the fishermen's interests (Fishermen's cooperative of Tyre and Syndicate of fishermen in the South of Lebanon) are not playing their role; moreover, due to the current economic crisis, the running costs of fishing are ever increasing. The fisheries sector has the poorest community in Tyre which has been incurring a lot of debt due to economic issues.

The tourism and fisheries sectors are interlinked in the summer season with fishermen being able to provide boat rides for city visitors. Through and/or involving the reserve, a network can be established between all sectors.

The reserve can be a place to sell and promote ecotourism and agro-tourism packages, have a shop to sell souvenirs made by women's coops and fishermen. It can be a place where technical assistance can be provided to guide fishermen and other tourism stakeholders in hospitality, hygiene, food safety, communication, and other. The main recommendations of this study are to: Improve local perception and awareness raising; community mobilization and engagement; fishermen's livelihood improvement and fisheries sector development; tourism stakeholders' livelihood improvement and tourism sector development; inter-sectoral work and engagement while encouraging women's and youth participation; and TCNR management strengthening and law enforcement.

<sup>1</sup> It is important to note that at the time of the study, August 2020 to December 2020, on average 1 USD was equivalent to 1,514 LB.



## 2. INTRODUCTION

The Specially Protected Areas Regional Activity Centre (SPA/RAC) of the United Nations Environment Programme - Mediterranean Action Plan (UNEP/MAP) has been designated as co-executing agency within the framework of the regional project «Towards achieving a good environmental status of the Mediterranean Sea and coast through an ecologically representative and efficiently managed and monitored network of Marine Protected Areas» (“IMAP-MPA Project”). The «IMAP-MPA» Project is funded by the European Union (EU) - Directorate General for Neighbourhood and Enlargement Negotiations (DG NEAR) and the European Financial Instrument of the 2018-2022 Green MED III: The European Neighbourhood Instrument (ENI) South, for Water and Environment. It is coordinated and implemented by the UNEP/MAP Secretariat and executed through its Programme for Assessment and Control of Marine Pollution in the Mediterranean Region (MED POL) and the Regional Activity Centre for Specially Protected Areas (SPA/RAC).

The IMAP-MPA Project aims at contributing towards the achievement of a Good Environmental Status (GES) of the Mediterranean Sea and coasts. It proposes to consolidate, integrate and strengthen the Ecosystem Approach (EcAp) for the management of Marine Protected Areas (MPAs) and their sustainable development, which will be achieved by monitoring and assessing the ecological status of the Mediterranean Sea and its coastline, including MPAs, in a comparative and integrated manner.

More specifically, the project aims to

- (i) improve MPA management through the coordinated implementation of the Barcelona Convention Roadmap for a comprehensive and coherent network of well-managed MPAs to achieve Aichi Target 11 in the Mediterranean and
- (ii) strengthen the integration of the Monitoring and Assessment Programme (IMAP) into this process. Hence, it will consolidate and further develop the Mediterranean network of ecologically representative, interconnected and effectively managed and monitored MPAs.

In Lebanon, SPA/RAC is jointly collaborating with the Ministry of Environment (MoE) to prepare a socio-economic assessment of the coastal and marine environment of the Tyre Coast Nature Reserve, with a view to developing a management plan for this Lebanese Specially Protected Area of Mediterranean Importance (SPAMI), and contributing, therefore, to improve the effective management and preservation of its terrestrial, coastal and marine heritage components. Within this context, the current study aims to provide synthetic information about the social and economic dynamics of the coastal and marine areas of the Tyre Coast Nature Reserve (TCNR), which will help national and regional decision-makers to plan for effective management and preservation of this potential SPAMI, while taking into consideration the integration of its terrestrial, coastal and marine cultural and natural heritage components.

This study report portrays the adopted methodology and data collection tools (section 2); provides a literature review of the general socio-economic characteristics of Tyre (sections 3 and 4); describes the state of the Tyre Coast Nature Reserve (section 5); presents the field work results (section 6); provides synthetic analysis and findings (section 7); and makes recommendations and suggests further steps for effective management of TCNR (section 8).



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### 3. METHODOLOGY

The study used mixed methods that combine quantitative and qualitative data collection and analysis, in addition to a secondary data review of existing literature. The primary data collection is based on the Participatory Rapid Appraisal (PRA) method and was done through multiple stakeholders' analysis and socio-economic survey tools designed to provide results that reflect the synergetic relation between the social characteristics of the study area and its livelihoods activities and economic sectors, namely fisheries and coastal tourism. Then, the collected information is analyzed, presented and visualized in different analytical frameworks to understand the dynamics of local resources management systems, and their relative importance in the sustainable use and conservation of the natural resources of TCNR and the surrounding area. Based on the results and findings, a recommendations' framework is elaborated to guide the future development of effective management plans for the study area.

#### 3.1. Secondary data

The secondary data collection and analysis served as a foundation for the identification of the socio-economic indicators analyzed in the study, as well as for the preparation of the field work and data collection tools. It consisted of reviewing and analyzing the existing literature about TCNR and Tyre city (reports, studies, articles, projects documents, laws and regulations). The literature review elaborated based on secondary data, presents the general context of coastal and marine resources management and use in TCNR and its area, with emphasis on the socio-economic aspects of the fisheries and coastal tourism sectors and the territorial development dynamics.

#### 3.2. Primary data collection: methods and tools

The Participatory Rapid Appraisal (PRA) methodology was used to collect primary data. PRA is an interactive data collection process conducted with specific community groups of interest using a set of tools to collect the information, interpret it, and present the findings in a clear and concise way which can be understood by a wide range of stakeholders. In this study, the target community groups are: fishermen and other fisheries related operators, coastal tourism and recreational service providers, farmers, TCNR management team, and local and national stakeholders (municipalities, relevant Ministries, and NGOs).

PRA methods provide information to both outsiders who wish to understand how the community uses and manages its resources, and to the communities themselves, enabling them to evaluate resource management practices. PRA is used to understand and examine existing practices, problems, conflicts, and opportunities regarding the use of resources, thus providing a basis for developing more sustainable and productive management systems. Through the interactive process of the PRA method, the consultant used a multi-disciplinary approach to collect and analyze data pertaining to the most important economic sectors and livelihoods activities in the TCNR area. Specific socio-economic data was collected through three main tools:

- A. **Site visits and direct observation** in the study area (TCNR zones, Tyre seaside area, Tyre fishermen's harbour, touristic attractions, etc.) to provide a general overview of the socio-economic context and the interactions between the local community, site users and visitors, the cultural landscape, and the physical environment. Site visits and direct observations are supported by non-formal (open-ended) interviews with key persons, which help in designing and using the other data collection tools.
- B. **Key Informant Interviews (KIIs)** conducted with **16** local and national stakeholders and organizations involved in coastal and marine resources management, TCNR management, and local livelihoods and economic sectors with focus on fisheries and tourism. To conduct the KIIs, the consultant developed a semi-structured questionnaire to discuss with the interviewees their perceptions of the relationship between local economic activities and coastal/marine resources management and conservation, in addition to stakeholders' relations and dynamics. The selection of Key Informants was done in coordination with the local authorities in Tyre (municipality and TCNR management team), as well as with the Lebanese Ministry of Environment (**Annex.1. Key Informant list and KIIs guide**).
- C. **Knowledge Attitude Practices (KAP) survey** used to provide insights into what stakeholders know about, believe and practice in relation to a particular topic. KAP data sets are collected using a structured and standardized questionnaire. The benefits of KAP surveys include easy design, quantifiable data, ease of interpretation, concise presentation of results, applicability of small sample results to a wider population, cross-cultural comparability and

speed of implementation and replication. Also, they reveal misconceptions or misunderstandings that may represent obstacles to future development plans and potential barriers to behaviour change. The KAP survey of this study provides information about the knowledge, attitudes and practices of the Tyre local community concerning the TCNR state, characteristics, management, and different usages of its natural resources, specifically in the fisheries, tourism and farming sectors. The studied population consisted of four different community groups living in the TCNR area:

- 1) Fishermen and fisheries operators,
- 2) Individuals and organizations working in the tourism sector,
- 3) Farmers cultivating the Ras el Ain area, and
- 4) Households living in the TCNR area.

The multi-stage random sampling method -most commonly used method when conducting KAP surveys- was applied to select the sample population. A total number of **81** respondents were interviewed, distributed as follow: 20 in the fisheries sector (all Lebanese); 20 in the tourism sector (all Lebanese); 20 in the agriculture sector (9 Lebanese, 9 Palestinian refugees, and 2 Syrians living in Lebanon); and 21 Households living in the Tyre area. The KAP questionnaire was administrated by an interviewer (**Annex.2. KAP survey questionnaire**). It contains a combination of close-ended questions with bivariate answers and ordinal scale responses (Likert Scale), and open-ended questions used to capture full and meaningful answers based on the respondents' own knowledge and/or feelings, or to gain insights on all the opinions on particular topics. The KAP survey questionnaire was tested before administration in order to adjust its sections and measure the time needed to fill it.

### 3.3. Results presentation and data analysis

The following techniques were used to analyze the secondary and primary data, specifically the KIs and the KAP survey results:

- Conceptualization, coding and categorization of the information;
- Content analysis to identify and highlight notable results;
- Trend analysis to examine relationships between economic sectors and to understand the perception of different local community groups in terms of coastal and marine resources management;
- Quantitative and qualitative data analysis for the KAP survey.

The analyzed data is presented and visualized in different analytical frameworks:

- Stakeholders' mapping and Value Chain (VC) structure for the fisheries sector;
- Stakeholders' mapping and Value Chain (VC) structure for the tourism sector;
- Driving forces, Pressure, State, Impact, Response (DPSIR) for local resources management and use;
- Figures and diagrams of the KAP survey results;
- Inter-sectoral analysis and Integrated stakeholders' map;
- Use of resources and management Conflict Matrix;
- Gender Analysis Framework (GAF).

Based on the analysis of the primary and secondary data, the study proposes a set of recommendations for the effective management of the TCNR and its surrounding area benefiting both the local communities and the natural environment.





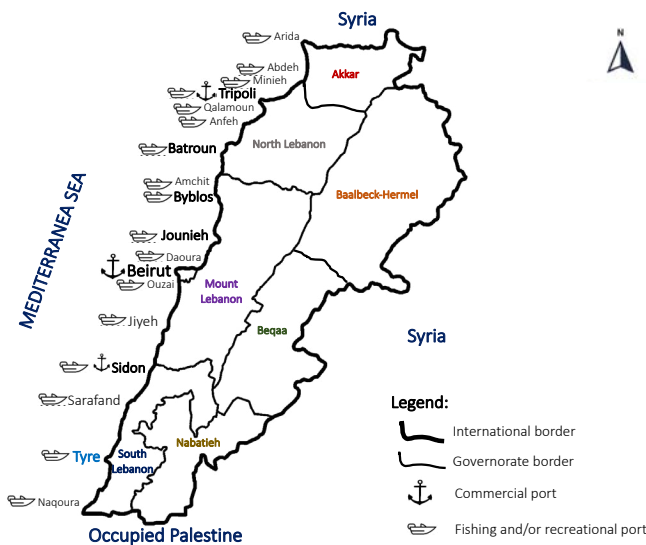


## 4. TERRITORIAL DYNAMICS

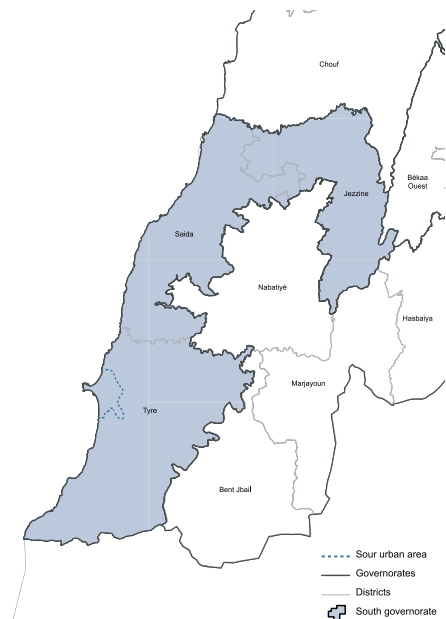
### 4.1 Geographical location

Tyre, often referred to by its Arabic name of Sour, is one of the most important coastal cities of Lebanon from an economic, socio-cultural, historical, touristic and ecological perspective. The city is located on the southern coast of Lebanon in the South Lebanon governorate, 84 Km south of the capital Beirut, 40 Km south of

Sidon, and 26 Km north of the international border with Occupied Palestine (**Map.1**). Tyre constitutes the main economic hub of South Lebanon along with the coastal city of Sidon and the administrative centre of the Tyre district<sup>2</sup> (**Map.2**). Tyre municipality is a member of the Tyre Union of Municipalities (TUM) which includes 60 other municipalities of the Tyre district. The Tyre mayor presides over the TUM.



Map 1. Tyre location on the Lebanese coast with major coastal cities and ports.  
Source: (Authors)



Map 2. Tyre city and urban area location in relation to South Lebanon Governorate and Tyre District.  
Source: (UN-Habitat, 2017)

### 4.2. Climate

Tyre has a hot-summer Mediterranean climate characterized by six months of drought from May to October. On average, it has 300 days of sun a year and a yearly temperature of 21°C. The average maximum temperature reaches its highest at 31 °C in August and the average minimum temperature is lowest at 10°C in January. On average, the mean annual precipitation reaches up to 645 mm. The temperature of sea water reaches a minimum of 17 °C in February and a maximum of 32 °C in August. At a depth of 70 m, it is constantly at 17–18 °C (Yacoub, El Kayem, & Moukaddem, 2011). The rising sea level due to global warming threatens coastal erosion of Tyre’s peninsula and bay area (Brown, 2018).

### 4.3. Historical evolution

Tyre hosted many civilizations throughout history, which resulted in its diverse layers of built and cultural heritage, counting the submerged ruins (Nahhas, 2013). The Tyre City Profile report published in 2017 by UN Habitat, depicts the main events that shaped the ancient and modern history of the city as well as its natural landscape:

**3<sup>rd</sup> Millennium BC:** Tyre developed over two distinct cores, one on the mainland (the old city known as Ushu which was founded in the late 3<sup>rd</sup> Millennium BC), and the other on an island less than 1 Km offshore, which subsequently developed as the trade centre. In ancient times, the island city was heavily

<sup>2</sup> South Lebanon governorate comprises three districts (or Caza in Arabic): Tyre, Saida, Jezzine

fortified. The mainland core, which in effect became a suburb of the island, was used as the island's source of water and timber. The island-city originally had two harbours, located on its northern and southern sides. These were instrumental in Tyre's historic rise to maritime trading success. Whilst the southern part of the ancient city (named the Island of Melcart) and its southern port (known as the Egyptian port) were submerged, the northern port (known historically as the Sidonia port) remained operational till today (**Map.3**).

**10<sup>th</sup> Century BC:** Tyre experienced its "golden age", through the 8<sup>th</sup> Century BC where its traders founded colonies in North Africa and around the Mediterranean and Atlantic, expanding their trade markets<sup>3</sup>. With Phoenician expansion from around 815 BC, maritime trade flourished.

**6<sup>th</sup> Century BC:** Nebuchadnezzar, King of Babylon laid siege to the city for 13 years, likely to have prompted the movement of population from the mainland to the fortified island city.

**4<sup>th</sup> Century BC:** As part of Alexander the Great's siege of Tyre in 332 BC - aimed at conquering the strategic coastal base - he dismantled much of the mainland city and used its fallen debris rocks to fill in the sea between the mainland and the island to create a land bridge for his war machines. This man-made bridge has been reinforced over time by heavy sedimentation to form today's promontory (**Map.3**).

**64 BC:** Tyre became a Roman province, during this era the Arch of Hadrian was built as well as a hippodrome. These archeological ruins are today the most famous attraction of the city.

**476 AD:** After the fall of the Roman Empire, Tyre continued as a port city under the Byzantine Empire.

**7<sup>th</sup> Century AD:** Tyre was taken during the Muslim conquest of the region.

**12<sup>th</sup> Century AD:** Tyre was captured during the first Venetian Crusade in 1124. In 1291, Tyre was taken by the Mamluk Sultanate.

**16<sup>th</sup> Century AD:** The Ottoman Empire ruled Tyre from 1516 until its fall in 1918.

**Modern history (1918-present):** With the end of World War I Tyre was integrated into the modern State of Lebanon under the French Mandate. In 1936 the French authorities established refugee camps in Tyre for Armenian refugees. Later, with the influx of Palestinian refugees in 1948, these already established refugee camps were denoted as Palestinian Refugee Camps<sup>4</sup>. In 1960s, Tyre city witnessed a rural urban migration leading to an increase in its urban density. With the start of the Lebanese civil war in 1975, Tyre's urban development progressed both horizontally and vertically in an uncontrolled manner. This has included haphazard development within proximity to major archaeological sites and historical properties. In 1978, the United Nations Interim Force in Lebanon (UNIFIL) was created after the invasion of the Israeli Army of south Lebanon<sup>5</sup>. After the Liberation of South Lebanon in the year 2000, Tyre started to regain its role as a major coastal city in Lebanon until the July 2006 war with Israel, which led again to major destruction in the area. However, this time the reconstruction and recovery was fast, especially with the support of international organizations. However, the stability period did not last for long, the outbreak of the Syrian war in 2011 resulted in a huge influx of Palestinian refugees living in Syria and Syrian refugees to Lebanon, in addition to the destabilization of the socio-political and economic situation in Lebanon. In Tyre, the Palestinian refugees coming from Syria settled in the Rachidiyeh camp and in El Bass, Jal el Bahr and the El Bourj areas; whereas the Syrian refugees settled in the old town and the Ras El Ain area, either in small housing units or informal settlements.

<sup>3</sup> A particularly prized commodity in Tyre's commerce was a locally produced, expensive purple dye used for the textiles of royalty (Nahhas, 2013).

<sup>4</sup> Tyre hosts 3 out of the 12 Palestinian refugee camps in Lebanon: El Bass, Rachidiyeh and Borj El Chemali.

<sup>5</sup> The UNIFIL was created and deployed in South Lebanon following the adoption of the United Nations Security Council Resolution 425/246 in 1978 to oversee the withdrawal of Israeli Forces, restore international peace and security and assist the Government of Lebanon restore its effective authority in the area. Following the 2006 Lebanese-Israeli war, the United Nations Security Council Resolution 1701 was adopted, increasing UNIFIL presence from 2,000 to up to 15,000 troops throughout the South to monitor the cessation of hostilities between Hezbollah and Israel. UNIFIL has currently 10500 uniformed personnel; deployed south of the Litani River area, including Tyre.



Map 3. Tyre before and after the Alexandrian siege (332 BC)

Source: ([https://www.reddit.com/r/PhoeniciaHistoryFacts/comments/fikc6l/city\\_of\\_tyre\\_before\\_and\\_after\\_the\\_alexandrian/](https://www.reddit.com/r/PhoeniciaHistoryFacts/comments/fikc6l/city_of_tyre_before_and_after_the_alexandrian/))

#### 4.4. Land use and land cover system

Tyre is a harbour city well recognized for its mercantile activity throughout the Mediterranean since ancient Phoenician times. Today, Tyre is considered Lebanon's fourth largest coastal city and is characterized by its wealth of sites of archaeological and natural significance (UN Habitat, 2017). The coastal, urban, agricultural and natural landscapes of Tyre are highly linked to its surrounding area. Seven towns and villages constitute a continuous landscape sharing a similar social structure and economic characteristics (**Map.4**):

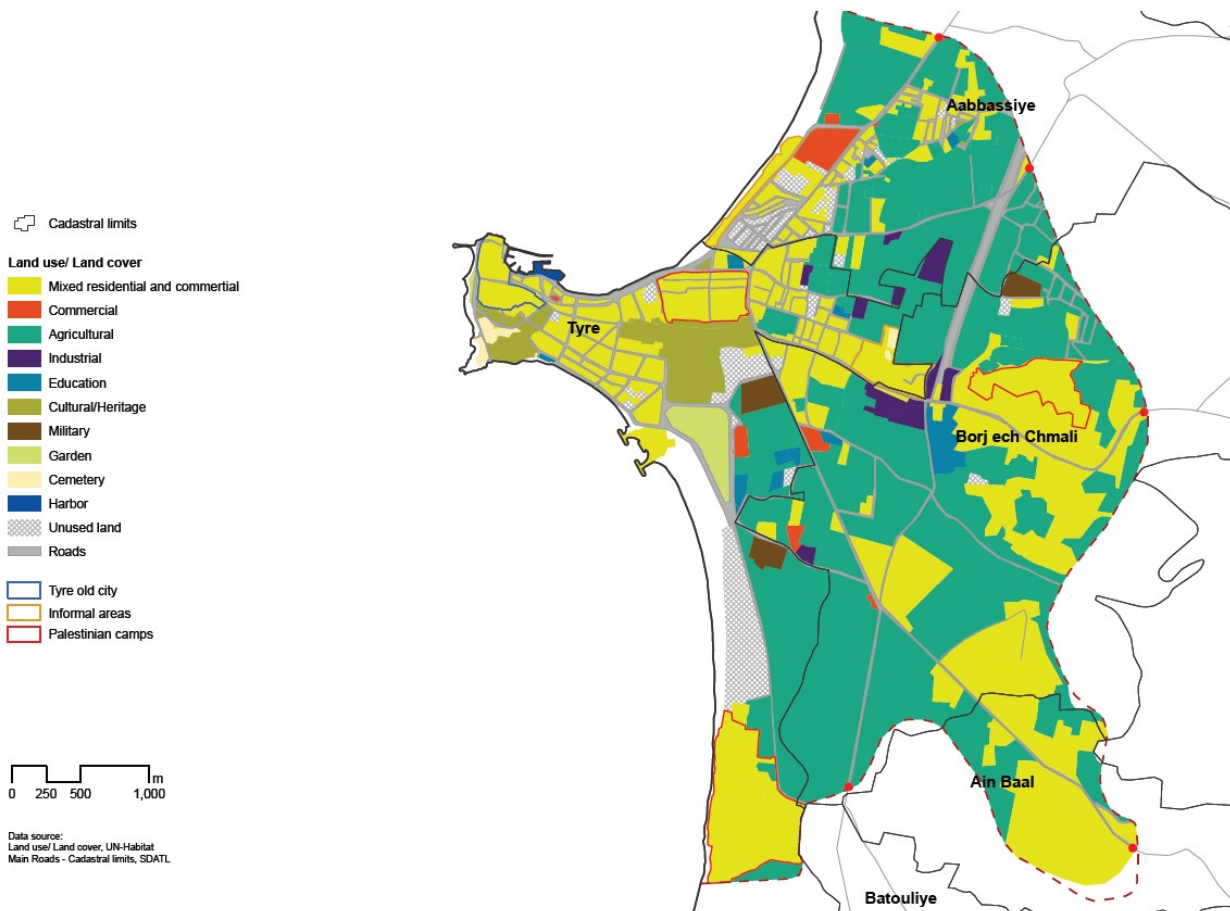
- *Ain Abou Abdallah* and *Mheibib* located to the north of Tyre are characterized by their coastal agricultural plain and low density urban areas.
- *Abbasiyeh*, *Borj El Chemali* and *Ain Baal* located to the north-east and east of Tyre are characterized by their agricultural lands and high density urban areas, as well as a sandy beach in Abbassieh and an industrial area in Borj El Chemali. Part of the sandy beach of Abbassieh was recently declared as MPA through Law no. 170 dated 8/5/2020.
- *Batoulay* and *Deir Qanoun El Ain* located to the east and south-east of Tyre are characterized by their agricultural lands and low density urban areas.

The landscape/land use system of Tyre and its surrounding area are characterized by the intra-urban agriculture territorial dynamics, with an underperforming and declining agricultural sector, threatened by an increasing urbanization rate. **Map.5** presents the general patterns of main land use categories of Tyre and its continuous built-up area extending over 16.2 Km<sup>2</sup>, covering, in addition to the city of Tyre, parts of the neighbouring towns of Aabbasiyeh, Borj El Chemali and Ain Baal. Agricultural lands occupy the highest single land use system of the territory (44 %), followed by heterogeneous built-up land (40 %).

The main concentration of built-up land is on the promontory but also stretches eastward inland to Bourj El Chemali. Industrial uses are dispersed to the north and to a lesser extent the south of the connecting east-west highway between these points, in the Bourj El Chemali municipality. Whilst the built-up area is compacted to the west side where it is constrained by the coastline, the density wanes with movement to the east, giving way to a spatially fragmented development pattern (UN Habitat, 2017).



Map 4. Tyre and main surrounding towns and villages  
Source: (Authors)



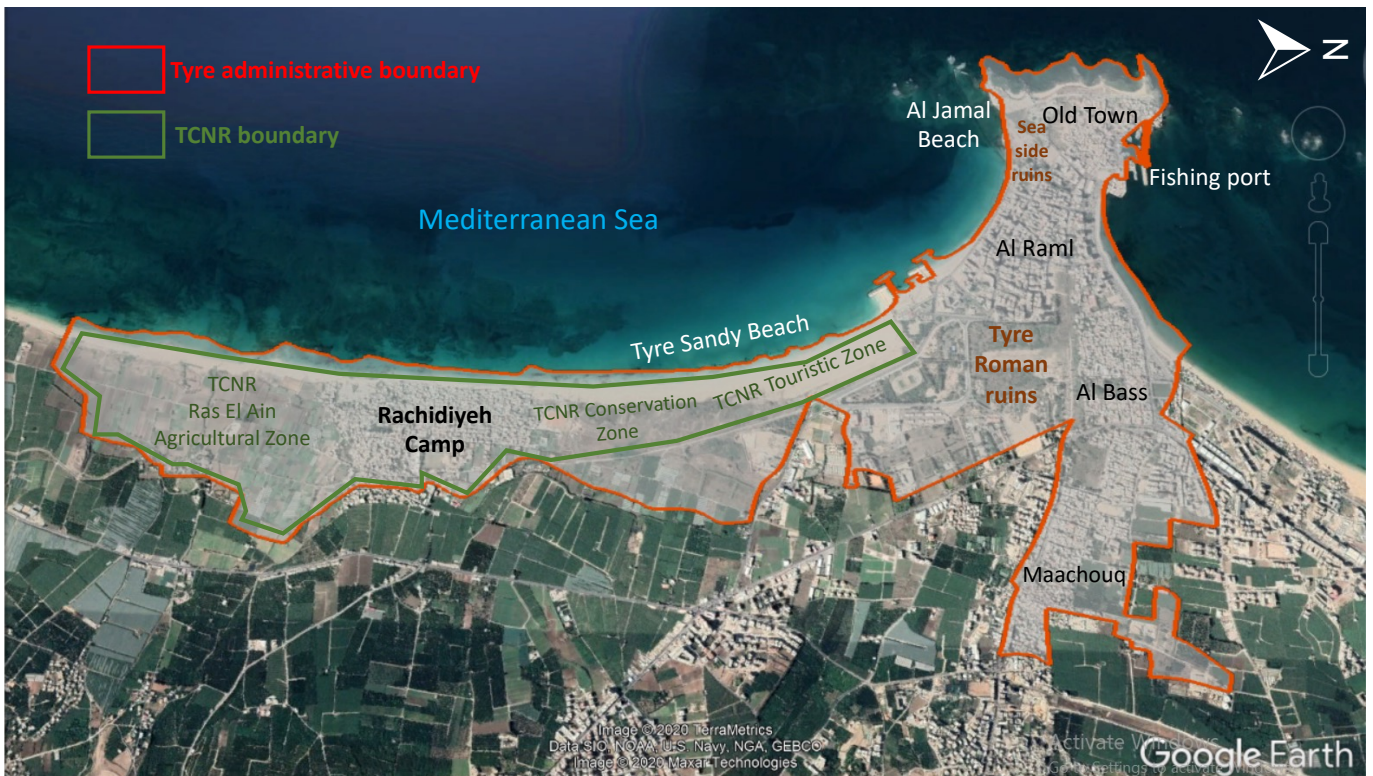
Map 5. Major land cover categories in Tyre urban area.  
Source: (Remote analysis from satellite imagery. UN-Habitat, 2016)

The administrative city of Tyre extends over 5.4 Km<sup>2</sup>. The Tyre municipality has the most diverse land use mix among the surrounding towns. It includes residential, commercial, military, educational and health facilities, gardens/playgrounds, agricultural areas, natural ecosystems, and cultural/heritage sites. The city can be divided into 5 major territorial units/landscapes (**Map.6**):

1. **Old town:** A distinguishing feature of the city of Tyre known for its historical and cultural landscape. This unit includes the fishing/recreational port to the north. The old town is composed of two quarters, or 'harat' in Arabic. The quarters are locally known as "*Haret el Masihiyeh*" (Christian quarter) and "*Haret el Jalaji*" (Muslim quarter). The old town is the main administrative hub in Tyre including major governmental and public buildings in addition to the popular market "Souk". Moreover, the old town is a main touristic attraction with a high concentration of tourism-related services, specifically guesthouses, boutique hotels, and small fish restaurants and snacks in the Christian quarter and next to the port. The old town has access to the Al Jamal beach known for its fish restaurants, underwater ruins and the seaside Roman archeological site.
2. **Al Raml** or the modern town. It constitutes the major economic hub and urban settlement of the

city. The seaside area of Al Raml is known for its 900 m Corniche with 20 restaurants and cafes, and more than 5 hotels and furnished apartment facilities, in addition to the Tyre Rest House beach resort (a facility owned by the Ministry of Tourism and managed by the private sector).

3. **Al Bass and Al Maachouq** are Tyre's main urban area with a high density population and small businesses.
4. **Tyre Roman ruins** constituting 6 % of the total area of the City. Enlisted on the UNESCO World Heritage List in 1984, they are one of the most important archeological sites on the Lebanese coast and a main touristic attraction for visitors interested in archeology, history and culture.
5. **Tyre Coast Nature Reserve (TCNR)** constituting around 2/3rd of the Tyre total area. In addition to the protected sea water, the coastal part of the reserve is divided into three zones: A) Touristic area and sandy beach; B) Conservation zone with sand dunes and coastal vegetation cover; C) Agricultural zone and Ras El Ain water springs. The reserve landscape and its ecosystems are disrupted by the Palestinian refugees' camp located between the conservation zone and the agricultural zone. (Cf. Paragraph 5 p. 29 for TCNR detailed description).



Map 6. Tyre territorial units and major landscape divisions.  
Source: (Authors)

## 4.5. Demography

Population data in Lebanon is generally poor. The most recent population census carried out in Lebanon dates to 1932. According to the National Physical Master Plan of the Lebanese Territories (NPMPPT) published in 2005 by the Council for Development and Reconstruction (CDR), the population of Tyre and its urban agglomeration was estimated at 117,000 residents: 48,000 in Tyre city and 69,000 in the suburbs. The report projected an increase in the population of Tyre agglomeration by 48% in 2030 to reach 174,000 residents: 52,000 in Tyre city and 122,000 in the suburbs (DAR, IAURIF, 2005). Other figures provided by the Tyre Union of Municipalities estimated the population of Tyre city at 60,000 residents in winter and 70,000 in summer. In addition to the Lebanese residents, Tyre city hosts around 55,000 refugees distributed as follow: 82% Palestinian Refugees (for quite a long time in Lebanon), 13.5% Syrian Refugees and 4.5% Palestinian Refugees from Syria. Around 60% of the refugees live in formal camps (mainly Palestinians) and the other 40% live out of camps in non-formal settlements or housing units in the poor quarters of the city or on agricultural lands. This large number of refugees (44% of the total number of residents of Tyre city) makes the area amongst the most vulnerable in Lebanon, especially with its very high population density (UN Habitat, 2017). The Tyre population density is estimated at 23,148 persons/Km<sup>2</sup>, almost 35 times higher than the national population density estimated in 2020 at 667 persons/Km<sup>2</sup>.

In the last fifty decades, Tyre and its surrounding area has witnessed many waves of external and internal migrations due to both security and economic reasons. Rural-urban migration has been the main cause of internal migration within the Tyre district. Work and education-related migration to Africa, Germany, the US, and the Gulf, has been the main cause of external migration. Some of the positive effects of migration are the remittances that are being sent by emigrants to support their relatives, building vacation homes, and participating in their villages' development. Some of the negative effects are that with the lack of a definite development strategy and solid lucrative projects that might interest emigrant investment, immigration funds have solely been used for real estate expansion. This phenomenon has led to increasing land prices which has resulted in the reassessment of plots of land away from agriculture and towards real estate development (CRI, Debs, ECODIT & IAURIF, 2015).

## 4.6. Human capital

Illiteracy rates in the district of Tyre are relatively high with 17% compared to the national level of 13%, with women representing higher rates reaching 23% (compared to 17% nationally). Additionally, there are around 7% of the Tyre district population with a university degree. And

there is a total of 80,680 school students with half in private schools, 39% in public schools, and 11% in UNRWA schools dedicated for Palestinian refugees. Tyre has the seventh highest public school attendance rate in Lebanon, which explains the high reliance on public schools in the district (CRI, Debs, ECODIT & IAURIF, 2015). Prior to the start of the Syrian war in 2011, South Lebanon's governorate scored the second highest poverty rate in Lebanon, with 11.64% of extremely poor living on less than \$ 2.4 per day and 42.1% living on less than \$ 4 per day. The high poverty rate was coupled with high unemployment levels and with poor living conditions for the unskilled labour working in the agriculture and construction sectors (World Bank, 2013). Today, the South Lebanon governorate is still the second poorest governorate in Lebanon with 42% occurrence of overall poverty (IUCN, 2017). The rapid unanticipated population increase has sparked off a higher demand for food and accommodation. Unemployment in Tyre in urban agglomerations is high, with 47% of Syrian refugees employed, 42% Palestinian refugees employed, and 43% of Lebanese employed. The employing sectors are agriculture, construction, and services industries – often unskilled labour for little income and low income security (UN Habitat, 2017). Nine years into the crisis and with the current economic and political instability in Lebanon, the situation got worse. The devaluation of the Lebanese currency made the price of basic commodities and the input costs in the different sectors sky-high. This not only affected the purchasing power of people, but also the continuity of businesses which ended up laying off many workers/employees, increasing with that the unemployment rate.

## 4.7. Households living conditions

The recent waves of displacement and the increased population and population density, had put the housing and shelter conditions at risk in the Tyre area. Most of the Tyre urban area can be categorized as fair to good quality (buildings requiring minor maintenance). The Ain Baal municipality has fair to good quality buildings which reflects the high value and greater real estate prices. Subsequently, the area has a minor refugee presence. Furthermore, all refugee camps have very poor quality buildings (housing requiring minor repairs and medium to high maintenance) and infrastructure due to overcrowding. Despite the limited vertical expansion and with fixed camp boundaries, the camps tend to build more floors to compensate for the increase in population (UN Habitat, 2017).

Numerous factors have affected the present property and tenure arrangements across Tyre, some of which are the local and regional conflicts, the Lebanese civil war, weak economic conditions and waves of displacements. According to a study conducted for the 1968 master plan, only 25% of Tyre residents owned properties in the city, while 75% were tenants. This percentage increased due to the civil war as a high number of property owners left their homes in the old



city and moved to Lebanon’s capital, Beirut. According to Nahas (2013), moukhtars and representatives from the Tyre municipality stated that the percentage of tenants had risen to 90%. This changed the socio-demographic profile of the historic core, as new populations replaced original dwellers (Nahas, 2013).

The population can be classified into three categories (Nahas, 2013):

- (i) Pre-1975 tenants - the oldest tenants, who pay relatively low rents, have contributed to maintaining a certain social consistency in some areas (old city). Most are low-income households working in the fishing industry;
- (ii) Post-1984 - migrants fleeing to Tyre seeking cheap rents or due to the presence of family members; and
- (iii) Displaced populations (Lebanese) - occupy either vacant private homes or precarious structures. For example, war-displaced communities that are still waiting for their compensation from the Ministry of the Immigrants occupy structures such as ‘Khan al- Rabou’ – a commercial structure.

Property in Tyre can be divided into three categories (Nahas, 2013):

- a) **Private property:** mostly inhabited by old Christian families who settled in Tyre at the turn of the 19<sup>th</sup> century. This property mostly consists of: Ottoman villas, commercial khans, and other residential structures.
- b) **Waqf land:** owned by the Catholic church, who owns a major portion of land in the historic core and within its vicinity, in addition to several churches. Commercial and residential buildings are also owned by the waqf. Residential buildings are leased by tenants who by now have lived in the Christian and Muslim quarters of the old city for the last few decades. Also Muslim waqfs are spread across the city.
- c) **Public property:** A high proportion of the property is public due to the wealth of archaeological sites in the city core. Most of it is owned by the Directorate General of Urban Planning.

**Table 1** showcases the access to services (household water, potable water, electricity, solid waste management, waste water and sanitation, and transportation) status in the Tyre urban area (UN Habitat, 2017):

Table 1. Access to services status in the Tyre Urban Area.

Services	Status
<b>Household water</b>	There are pressures on the housing market, shelter options and tenure due to increase in population with the waves of displacements. Additionally, there is an increase in real-estate prices and informal housing which are becoming dominant features in Tyre. This rise in real-estate prices has caused an additional pressure on the housing/shelter market especially in the city. This forces mainly the vulnerable to reside in low cost and informal housing.
<b>Drinking water</b>	There is a shortage in good quality and sufficient water supply because of the increasing demand coupled with scarce supply. Private water wells are suffering from increasing levels of pollution due to improperly installed sewage networks. All of this poses serious health hazards for the community. In the Old town in Tyre, the water pipes are either not properly connected and/or backfilled, which leads to soil intrusion and pollution.
<b>Energy</b>	Tyre thermal power plants, as most of them in Lebanon, operate at high costs using Gas oil (Diesel) rather than natural gas (less costly). Additionally, the Tyre urban area experiences electricity rationing and reliance on back-up private generators, which is very common all over Lebanon.
<b>Solid waste management</b>	The Union of Tyre municipalities monitors well the solid waste information in Tyre. This information serves as an alternative for the traditional, mostly outdated, population census methodology. The solid waste sorting and composting plant of Ain Baal is not adequately equipped to deal with the district’s needs, which necessitated the continuous dumping in the Ras El Ain landfill site, as well as in other random dumpsites in and around the City.
<b>Waste water and sanitation</b>	Waste water discharges in the old city near the fishing port, affecting negatively the population as well as two of the key income sectors: tourism and fishing. The lack of funding and sound strategies addressing wastewater, is a major factor hampering the development of a strong wastewater infrastructure and management system in Tyre. The coastal area, as well as areas adjacent to seasonal water streams are most prone to flooding during rainfall due to rapid urbanization; currently the wastewater system serves storm water drainage, thus a solution is necessary to deal with the inter-dependency between storm water and wastewater networks.
<b>Transportation</b>	Tyre lacks a sound transportation plan and limited financial, human and technical resources, which impede any policy making efforts resulting in a negatively performing transport system that directly hinders social and economic development. There is currently an existing under-maintained and overburdened network of regional and local roads, which provides basic connections between Tyre and its neighbourhoods. Tyre’s low-quality/informal public transportation system lacks organization and structure, and does not provide a reasonable alternative to private cars, restricting its use to only a few passengers who have no other choice. Soft mobility is not catered for in the city, yet Tyre has both a favourable small size and flat terrain for this type of practice. Facilitated pedestrian routes and cycling would help decrease stress on the roads network and promote environmentally friendly mobility patterns.

## 4.8. Territorial governance

About three hundred and thirty-nine taxa (320 at lower Lebanon is divided into 8 governorates containing a total of 25 districts including Beirut (Cf. Figure.1). The south governorate is made up of the Jezzine, Tyre and Saida districts. The Tyre district has 67 municipalities (**Figure.1, Map.7**) including the Tyre municipality, its administrative centre (localiban, 2015). The Tyre Union of Municipalities includes 60 municipalities and 3 localities without municipal councils, represented by their moukh-tars (UN Habitat, 2017). Each District is managed by a Qaimmaqam, who is an executive officer selected by the Cabinet (the Ministry of Interior) to oversee and control the activities of the municipal councils in each district,

as well as several other administrations where possible. The Qaimmaqam is hierarchically subordinate to the Governor and is answerable to him/her in applying the government's policy.

Unions are authorized by decree no. 118/77 to ensure meso-level coordination of municipal functions and resources. This is with regard to responsibilities better tackled at a cross-boundary strategic scale rather than at a municipality level. Unions are authorized to implement public projects benefitting member municipalities including road network/transportation, sewage, garbage/solid waste, co-operatives and markets (Article 126). Inter-municipal cooperation at union level on public interest issues may support areas in defining distinctive regional visions for development (UN Habitat, 2017).

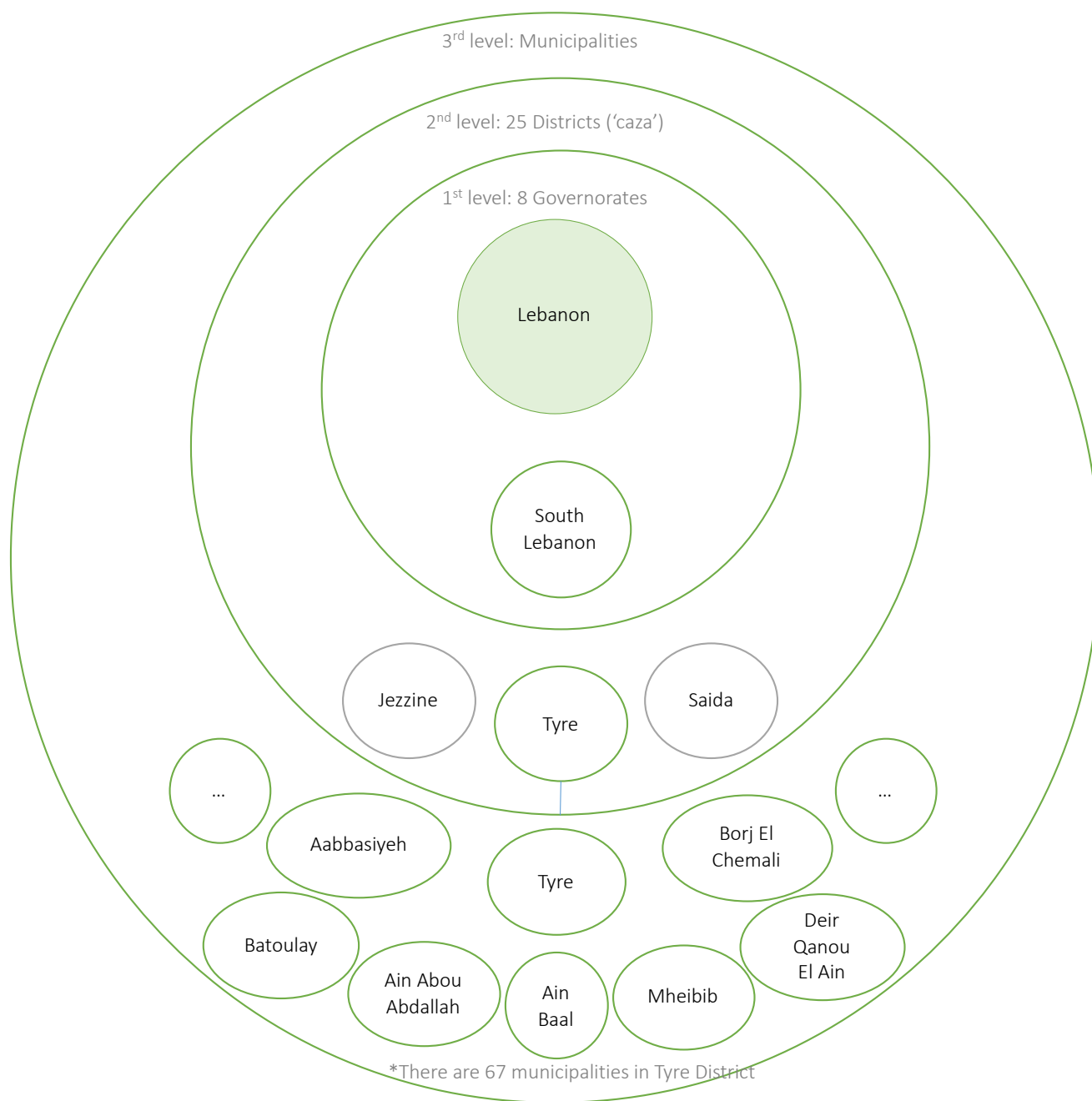
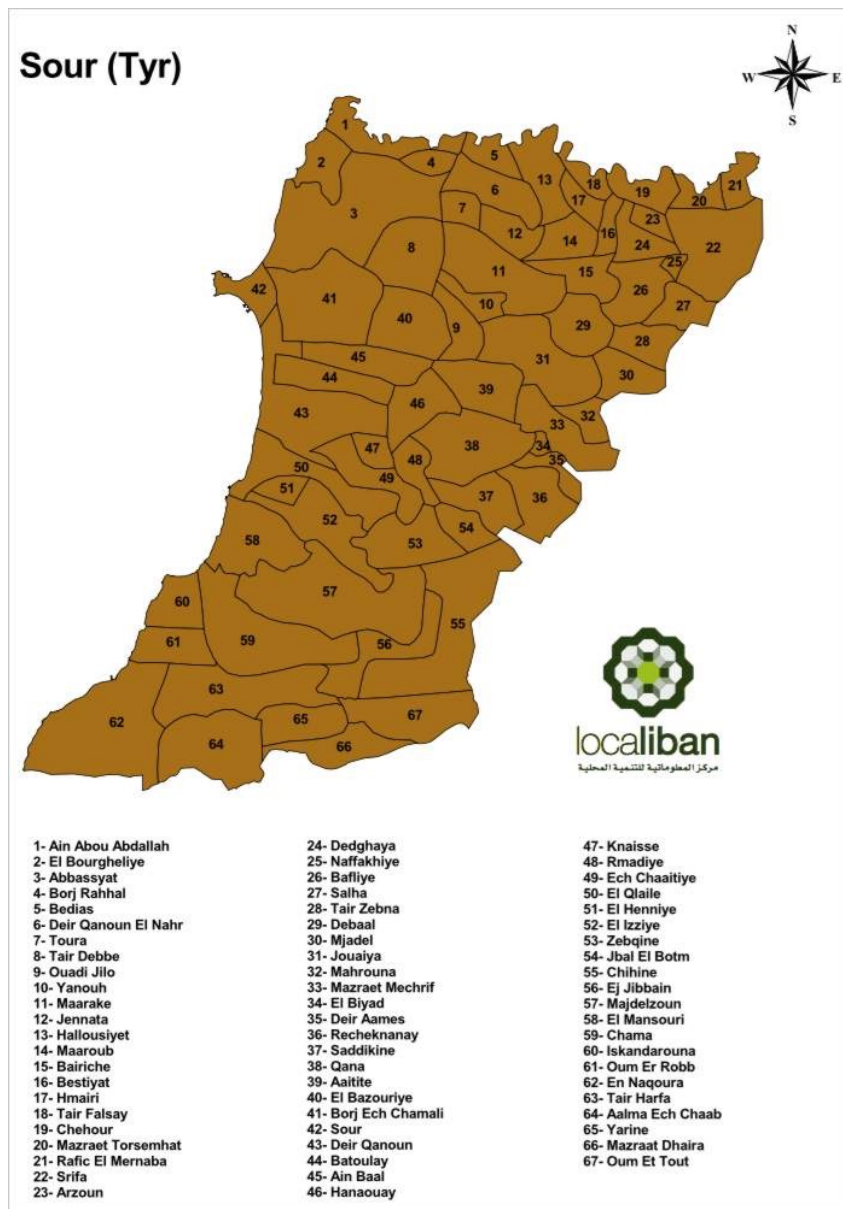


Figure 1. Lebanon administrative division.  
Source: (Authors)



Map 7. Tyre District Municipalities Map.  
Source: (localiban, 2015)

The head of the Tyre municipality, the mayor, is also the head of the Tyre Union of municipalities. At the municipality level, it handles projects for its own territory, while the union of municipalities must ensure coordination with a minimum of 3 municipalities when undertaking projects. The Tyre municipality provides financial support to the union to support its functionalities. 10% of the municipality profits goes to the union of municipalities. The head of the municipality coordinates with INGOs and local NGOs in assessing whether or not there is a need for the NGOs' proposed intervention and the mayor reaches out to NGOs/ UN agencies if there is a specific project he wants to implement.

There are many actors involved in the informal governance of Tyre including community leaders,

neighbourhood committees who can support or hinder development initiatives as well as major and minor interventions across all sectors. Some of the main non-governmental stakeholders include (UN Habitat, 2017); political parties: the dominant Political Parties are the Amal Movement and Hezbollah who are represented in the municipal council and union locally and the parliament and cabinet nationally. They have strong influence on the implementation or abolition of projects in Tyre; Al-Baqa, the fishermen's cooperative and commercial collectives of other trades; the Greek Catholic waqf; Cultural & Educational bodies; Community organizations; Religious organizations; UNIFIL; Popular Committees and political factions within the Palestine refugee camps; UNRWA; and local property owners (specifically in relation to city planning).



## 5. ECONOMIC ACTIVITIES AND LIVELIHOODS

The lack of city-level economic data undermines the capacity to describe and monitor the economic trends of both urban and rural areas. Based on literature reviews and existing data, this section presents a general overview of the three main economic sectors of Tyre: Fisheries, Tourism and Agriculture.

### 5.1. Fisheries sector

The Lebanese coastline covers 220 km, 50 km of which constitute urban areas. The fisheries sector's contribution to the national economy is very low. According to the reported data to FAO – East Med Project, the fisheries catch in Lebanon in 2014 represented 2,998 tons and in 2015, it represented 3,483 tons (ADR, IUCN, 2017). Small scale fisheries characterize the sector in Lebanon with the use of nets, longlines, purse seiner nets, trammel nets, and beach seiners. The Lebanese fisheries and aquaculture sectors are managed by the Ministry of Agriculture – Department of Fisheries and Wildlife. There are 9,000 fishermen, 86 % of which are members of the 33 established cooperatives in Lebanon (ADR, IUCN, 2017). The navigation licence is provided by the MoPWT (DFW, 2016). Most vessels are of the *Flouka* type, constructed in Tyre, Sidon, or Tripoli. *Floukas* vary in size from 3 to 15 meters (Majdalani, 2005). Fishing in Tyre has been an old profession practiced throughout the generations. "Samkit Sour" -Fish of Sour- is popular and valued throughout Lebanon. In 2004, 174 of the fishing vessels in Tyre were built in the city's port (IUCN, 2017). Most vessels are owned by Lebanese fishermen and it is believed that Palestinians do use fishing vessels and practice fishing through their Lebanese friends or their Lebanese wives. Similar to the fishermen's community in Lebanon, that of Tyre is characterized by an ageing population, with an average age of 52 years (Majdalani, 2005).

#### 5.1.1. Fisheries and their households

The majority of fisheries households (55 %) consist of 3-7 members, and 37 % have 5-7 members (Halabi, 2016). This composition of the households' members creates an increasing number of dependents on the fisheries sector. The monthly income of fishing community households varies depending on the catch and depending on whether the household relies solely on the fishing sector or not. Over 65 % of households earn between 701 and 1,200 USD\$ per month, 17 % earn between 501 and 700 USD\$

per month, 14 % earn between 301 and 501 USD\$ per month, and 4 % earn between 0 and 300 USD\$ per month according to Halabi (2016). It is important to note that currently with the economic crisis, the fishermen are earning in Lebanese Pounds and we can assume that despite the devaluation of the Lebanese Lira, fishermen are still earning per month the amounts mentioned by Halabi in 2016, with 1 USD\$ equal to 1,500 LBP since the price per fish did not increase as much as the value of the Lebanese Lira. According to the same study, the majority of the fisheries households spend more than what they earn with household debts amounting to USD 3,008. However, 45 % of the households in the study claimed they do not have any debts. The debt incurred by the fishermen is not only limited to fishing activities and expenditures, it also includes school tuition fees, healthcare and daily expenses. Hence, many fishing households rely on other sectors as well: 21 % on contract work, 20 % on retail, 20 % on vocational, 15 % on hospitality, 15 % on real estate, 6 % on the State, and 3 % on education. (Cf. **Annex.4 for more details**).

#### 5.1.2. Fisheries Sector Value Chain

72 % of the fishermen own a boat, and the remaining 28 % do not, relying on joining other fishermen in their daily activities. The main fishing methods adopted are (Halabi, 2016): 40 % other fishing techniques; 26 % large nets; 17 % small nets; 10% compressor; 5 % fishing during the mating season; and 2 % using dynamite. There are 576 fishermen in Tyre. The sector is mainly led by fishmongers who are the main intermediary between fishermen and consumers. They benefit from a 100 % markup on all the fish caught by the fishermen. With that, fishermen have become dependent on them to sell their produce since they are not in direct contact with the consumers, and on receiving loans to cover their high running costs (ADR, IUCN, 2017). Additionally, with the absence of a functioning syndicate and fishermen's cooperative, there is no one to defend the rights of the fishermen and the sector. (Cf. **Annex.4 for more details**).

#### 5.1.3. Fisheries Sector Challenges

The challenges faced by the fisheries sector are listed in the table (**Table 2**) below, showcasing the different challenges per category (environmental, economic, and social).

Table 2. Challenges in the fisheries sector

<b>Environmental</b>	Overfishing and Illegal fishing practiced by artisanal and recreational fishing. Abiding by the national law and for safety reasons, fishing should be within 6 nautical miles from the coast. Hence, with this narrow coastal strip, concentrated fishing activities led to the overexploitation of coastal species, which ended up affecting the fish stocks. With this decrease, more illegal fishing started, using – small nets, hooks and explosives- thriving on the outdated legislation and lack of enforcement (ADR, IUCN, 2017).
	Marine pollution resulting from the lack of urban and industrial waste management (including non-biodegradable plastic) and the absence of an operational sanitation network affecting the marine fauna –including sea turtles (ADR, IUCN, 2017).
	Overpopulation of the Lebanese Coastal zone especially around coastal slums in major cities (MOE & UNDP, 2010). This occurred mainly during the Lebanese Civil war. This overpopulation has threatened landscapes and affected biodiversity, while structures like marinas have disturbed regular water flux and increased sand deposition (MOE, UNDP & ECODIT, 2011).
	Oil and Gas operations pose a threat to marine biodiversity and to the environment through oil spills, accidents and blow –outs from constructions that set up at sea (SPA/RAC-UNEP/MAP, 2020).
	Invasive species which are affecting the sea biodiversity.
<b>Economic</b>	Lack of national collective labour agreement representing the fishermen. With limited financial resources and lacking an effective and clear policy management has a detrimental effect on the fisheries and the aquaculture sectors' potential. This has led to the sectors' steady decline in terms of productivity and in relation to the living standard of fishermen and fish workers involved in the sectors (ADR, IUCN, 2017).
	Limited market knowledge and lack of understanding of fish consumption patterns or potentialities in cultivated products and new harvested species. There is also a lack of a strategic vision for the definition of priorities that could create job opportunities in the sector (ADR, IUCN, 2017).
	Lack of legislation enforcement capabilities (ADR, IUCN, 2017).
	Lack of municipal and governmental support (Halabi, 2016).
<b>Social</b>	High running costs of fisheries' activities (Halabi, 2016).
	Lack of "knowhow" on how to implement an MPA with limited human activities and multi-use adjacent zones, but still with organized anthropogenic activities (IUCN, 2017).
	Missing technology improvements in the sector.
	Lack of supporting infrastructure (Halabi, 2016).

## 5.2. Tourism sector

Tyre is internationally recognized for its natural and historical heritage. Its monuments are even more varied than those of Baalbek (DAR, IAURIF, 2005). Tyre is a tourist attraction for local and international discoveries, attracting 50,000 visitors a year to visit its sandy beaches and archaeological sites (CCA Coalition, 2019). Tyre's beach is internationally renowned, it was acclaimed as one of the top 10 Middle Eastern beaches by National Geographic (NAHNOO, 2019). Moreover, Tyre city is the top local destination to be visited until the end of 2021 (Abou Arrage & Ghadban, 2020).

TCNR is a listed Ramsar site that is a central nesting ground for the IUCN's red-listed loggerhead and green sea

turtles, whereas the archaeological sites in the city of Tyre are registered as a UNESCO world heritage sites since 1984. There are 36 % tourism-related establishments in Tyre city, where most of the touristic activities are (CCA Coalition, 2019). According to online searches, there are around 20 facilities providing accommodations and around 100 restaurants and cafes in Tyre.

Tyre beach remains one of the few public beaches in Lebanon which comprise only 20% of the Lebanese shore – with 1068 violations recorded, according to the MoPWT (NAHNOO, 2019). There are many tourism offerings in Tyre from private beaches (resorts) to public beaches and each has a different impact on a city such as Tyre (cf. Box.1).

**Box.1: Public Beach vs. Private Beach in Tyre (NAHNOO, 2019).**

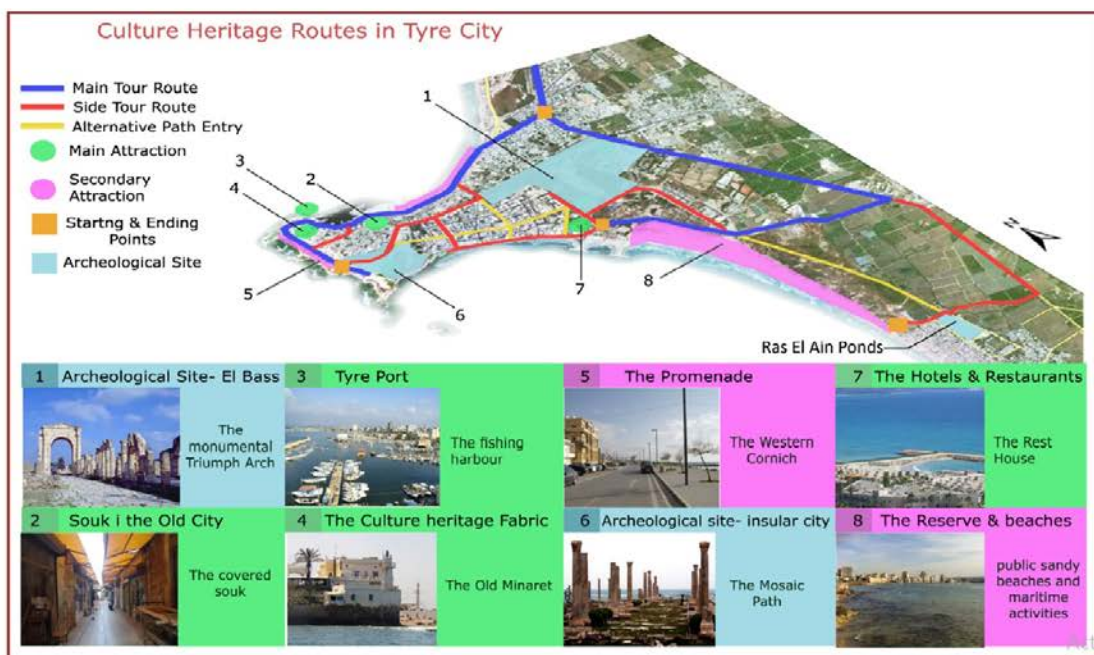
From around 450 people interviewed in Tyre for the study conducted in 2019 by Nahnoo, 62.8 % preferred public beaches over private establishments, of whom 58.6 % noted that they preferred public beaches over private resorts because the latter were overpriced. In general, most of the population interviewed sees the added value that both establishments have in their city (Private resort 96.5 % - Public beach 93 %). Most public beach visitors buy from nearby shops during their visit to the beach, in contrast, visitors to private resorts do visit nearby shops but not in the course of their beach visit. 50 % of the respondents in Tyre said that they would be better off without private resorts as it would decrease the amount of garbage and sewage disposal and private resorts prevent them from freely accessing the shore. Moreover, the study noted that the fishermen (56 %) perceive the private resorts negatively as their presence limits their access to the sea (61 %). Compared to other coastal cities in Lebanon, people from this study were satisfied with the Tyre public beach in terms of cleanliness, facilities, security and safety. Few noted the need for improved sanitary facilities and improved garbage disposal.

As for value calculations on how important the public beach is to Tyre, the study compared the returns to public beaches and private resorts in Tyre. It is adjusted for the opportunity cost of having private resorts, as well as the different surface areas of the public and private beach occupations. So if the value of a public beach is positive, the public beach is designated as economically valuable to Tyre. The value that the public beach generates is an extra 4,205,544,650 LBP per month to the economy of Tyre during the active summer season.

In Tyre, the incorporation of the urban heritage values of the old city into a wider framework of city development means that other areas of high heritage sensitivity and interest could be suggested and this again means more attention to planning, design and implementation of development projects.

**Map.8** shows different attraction points in the city; the potential for linking these touristic hubs to the sustainable development strategy of the city is the main challenge to achieve a balanced management that respects the social, environmental, economic and cultural dimensions (Zeyter & Mansour, 2017). There are many stakeholders involved who benefit from the tourism sector and from the support of governmental bodies such as the Ministry of Tourism, Ministry of Culture, Tyre Municipality, TCNR; and from

non-governmental bodies such as Hotels, Airbnbs, guesthouses, restaurants, minimarkets, coffee shops, and pubs and the main beneficiaries are the city visitors. Additionally, other sectors like the fisheries sector is benefiting from the tourism sector by providing boat tours. Thus it is a question of establishing a balance between preserving the natural reserve, archaeological sites and significant historic fabric on the one hand and the critical gentrification threat, the economic pressure and the building pathology on the other hand. The Historic Urban Landscapes framework should be established in such a way as to respect all the tangible and intangible values of the city and enhance the economical potentials from all these components (Zeyter & Mansour, 2017).



Map 8. The cultural tourism routes and paths in Tyre city.  
Source: (Zeyter & Mansour, 2017)

## Tourism Sector Challenges

The challenges faced by the tourism sector are listed in the table below showcasing the different challenges per category (environmental, economic, and social). **(Table.3)**

Table 3. Challenges in the tourism sector.

Challenges	
<b>Economic</b>	Lack of recreational facilities in Tyre <b>and cultural facilities such as movie theatres, cultural clubs ...</b> (CRI, Debs, ECODIT & IAURIF, 2015).
	Lack of coordination between the different tourism sectors' stakeholders. And missing entity representing the tourism sector.
	Lack of funding to promote tourism in Tyre.
	Instability of the security situation in Lebanon <b>drives investments away from touristic activities and more towards non-productive "safer" funds such as purchasing land.</b>
<b>Social</b>	<b>Lack of visitors' awareness of the different tourism offerings</b> in Tyre due to the lack of coordination between the tourism sectors' stakeholders and lack of marketing.
<b>Environmental</b>	<b>Mass tourism is impacting the environment negatively</b> as well as the sea biodiversity especially at Tyre's seashore where people are leaving their garbage behind.
	<b>Wastewater discharge into the sea and Ras El Ain dumpsite for solid waste because of the non-functioning waste treatment facility in the Ain Baal village.</b>
	<b>Lack of visitors' awareness of the importance of protecting the environment and respecting public spaces.</b>

### 5.3. Agriculture sector

Extending from Sidon to Tyre, South Lebanon is one of the main agricultural regions in Lebanon where intensive agriculture is practiced mainly through the adoption of greenhouse production. Greenhouse agriculture in South Lebanon covers an area of 6,277 ha, 78 % of which is used for fruit plantations.

Permanent agriculture lands cover an area of 201,539 ha, 38.9 % of which is occupied by olives, and 31.6 % of citrus fruit trees **(Figure.2)**.

The Tyre District is considered one of the largest and most fertile coastal plains in the country and accounts for about 20 % of employment in the District in comparison to 8 % in Lebanon (CCA Coalition, 2019). The main crops produced in the Tyre district are: bananas, citrus, olives, tobacco, avocado and other medicinal/industrial and

exotic fruits **(Figure.2)**. Olives and citrus fruit farming occupy about two-thirds of the district's crop agricultural land in terms of hectares. A limited percentage of livestock farming takes place, with 506 mainly small-scale farms functioning. Organic farming has also been initiated in the area (CRI, Debs, ECODIT & IAURIF, 2015). Most farmers sell their produce at the Tyre and/or Saida fruits and vegetable wholesale market, which in turn sells the produce to retailers (supermarkets/mini markets, and restaurants) and consumers.

### Agriculture Sector Challenges

The challenges faced by the Agriculture sector are listed in the table below **(Table 4)** showcasing the different challenges per category (environmental, economic, and social).



Table 4. Challenges in the Agriculture sector

Challenges	
<b>Economic</b>	Production costs and transport of agricultural products to markets at scale face two major obstacles impeding agricultural production. Traders/wholesalers regulate produce prices leaving farmers at risk. Fruits are transported to the 'hisbeh' (local wholesale market) and the farmer only gets paid if the harvest is sold. There is also no contract between the farmer and the wholesaler verifying the amount sold and the sale price (CRI, Debs, ECODIT & IAURIF, 2015).
	High land and electricity costs restrict agricultural production and competitiveness in regional and international markets (CRI, Debs, ECODIT & IAURIF, 2015).
<b>Social</b>	There is a lack of agricultural advisory services or organized lobbying such as a farmers' union, or logistical/infrastructural support services such as refrigeration warehousing facilities. In economic development and social mobility terms, there is tension at the heart of the sector: the intensive labour required within what are often family-owned businesses, can provoke the withdrawal of children from education for farm work earlier than would have been the case in non-farming familial contexts (CRI, Debs, ECODIT & IAURIF, 2015).
<b>Environmental</b>	There is overuse of fertilizers and pesticides which can affect the quality of the produce, infiltrate and infect the groundwater city supply, and/or reach the sea and affect fish biodiversity.

Qada' of Sour

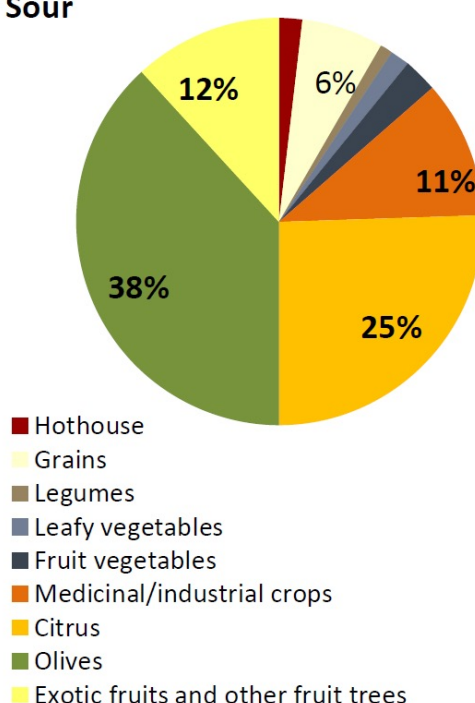


Figure 2. Distribution of agriculture lands in the Tyre district by type of crop. Source: (CRI, Debs, ECODIT & IAURIF, 2015).

#### 5.4. Other economic activities

The South Governorate was particularly renowned for commerce and hospitality, services, and agriculture in decreasing order of importance according to Nahhas (2002). Compared with the national level, the South governorate showcased a specialization in agriculture. Currently, agriculture and construction are the dominant sectors leading to the main livelihood sectors (MercyCorps & SHIELD, 2015). South Lebanon comes in fourth place after Mount Lebanon, Bekaa, and the North in terms of the number of enterprises (Lebanon industry, 2019).

Across the Tyre urban area, the economy is mostly relying on tourism, contracting services, emigrant remittances and the construction sector. The services sector is mainly dominant in the Tyre Urban Area as it includes the highest number of industrial units. Employment in the Tyre urban area is concentrated in the Tyre municipality. Many of the enterprises are in the trade and services sectors, however, the sector with the highest share of employment is the industrial sector. Nonetheless, the economy in Tyre is mainly dependent on tourism, archaeological heritage, hotels and beaches.



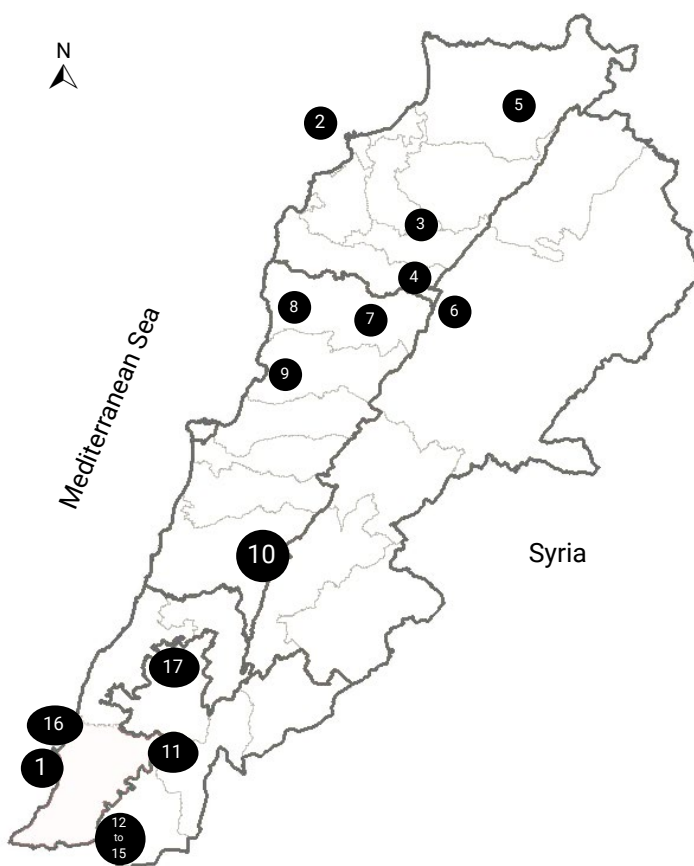
## 6. TYRE COAST NATURE RESERVE

### 6.1. Overview

The Tyre Coast Nature Reserve (TCNR) is located in the Sour district in the South Lebanon governorate. It is one of three Marine Protected Areas and one of

the 17 nature reserves in Lebanon (**Map.9**). TCNR was established in 1998 (Law 708/98), it was named a Ramsar site in 1999, and designated a Specially Protected Area of Mediterranean Importance in 2013 (SPA/RAC & MedPAN, 2019)<sup>6</sup>.

#	Nature reserve	District Gouvernorate
1	Tyre Coast	Sour - Southe Lebanon
2	Palm Island	Tripoli - North Lebanon
3	Horsh Ehden	Zgharta - North lebanon
4	Tannourine Cedars	Batroun - North Lebanon
5	Karm Chbat	Akkar
6	Yammouneh	Baalbeck
7	Jaj Cedars	Jbeil - Mount Lebanon
8	Bentael	Jbeil - Mount Lebanon
9	Chnanaair	Kesrouane - Mount Lebanon
10	Shouf Biosphere	Shouf - Mount Lebanon
11	Wadi Al Houjair	Marjaayoun - Nabatieh - Bint Jbail
12	Beit Lif	Bint Jbail
13	Ramia	Bint Jbail
14	Debel	Bint Jbail
15	Kafra	Bint Jbail
16	Abbassieh	Sour - South Lebanon
17	Nmayrieh	Nabatieh

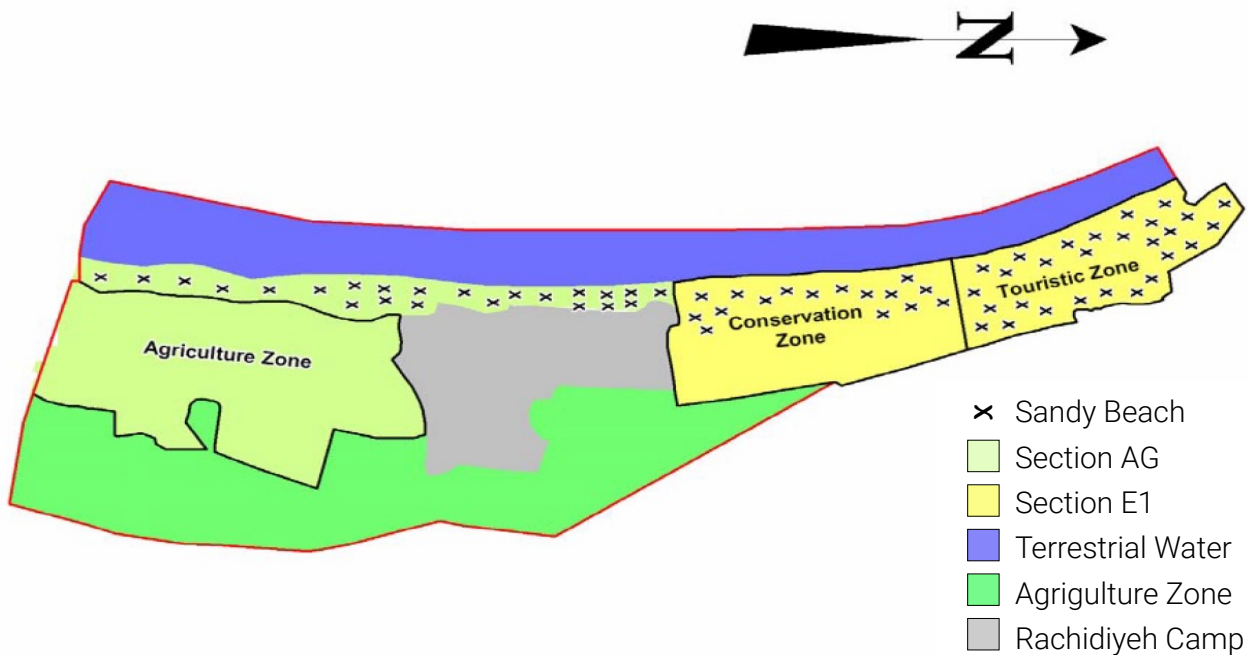


Map 9. Nature Reserves location in Lebanon  
Source: (Authors)

The reserve area covers 380 hectares with approx. 3.5 kilometers in length from Tyre's Rest House to Ras El Ain (NAHNOO, 2019). The reserve has the widest sea shore on Lebanon's coast, characterized by its sandy beaches (**Map.10**). TCNR is a nesting area for migratory birds and for endangered Loggerhead and green sea turtles,

among many other species. TCNR has the last sand dunes' ecosystem with its associated flora and fauna in Lebanon and it is a wetland with non-halophyte plants (salt tolerant plant) on the coast and the beach within a Mediterranean framework (SPA/RAC - UNEP, 2011).

<sup>6</sup> Nature Reserve is a terrestrial or marine zone where nature conservation measures are established in order to protect ecosystems, habitats or organisms of particular importance. Nature Reserves are established with a Law ratified by the Lebanese Parliament. They are managed by a Reserve Committee under the supervision of the Lebanese Ministry of Environment. Ramsar Sites are designated based on the Convention on Wetlands of International Importance, more commonly known as the Ramsar Convention. It is an international designation aiming at promoting the conservation and wise use of wetlands. It is the only global treaty to focus on a single ecosystem.



Map 10. TCNR different zones.  
Source: (Ministry of Environment, 2016)

## 6.2. Governance and management

According to Lebanese law, public lands fall under the legal ownership of the Ministry of Finance (MoF). But as a nature reserve, TCNR falls under the mandate and overall supervision and management of MoE, however, TCNR's land falls under the legal framework of different governmental administrations as per their mandate (TCNR Management Plan , 2002-2006):

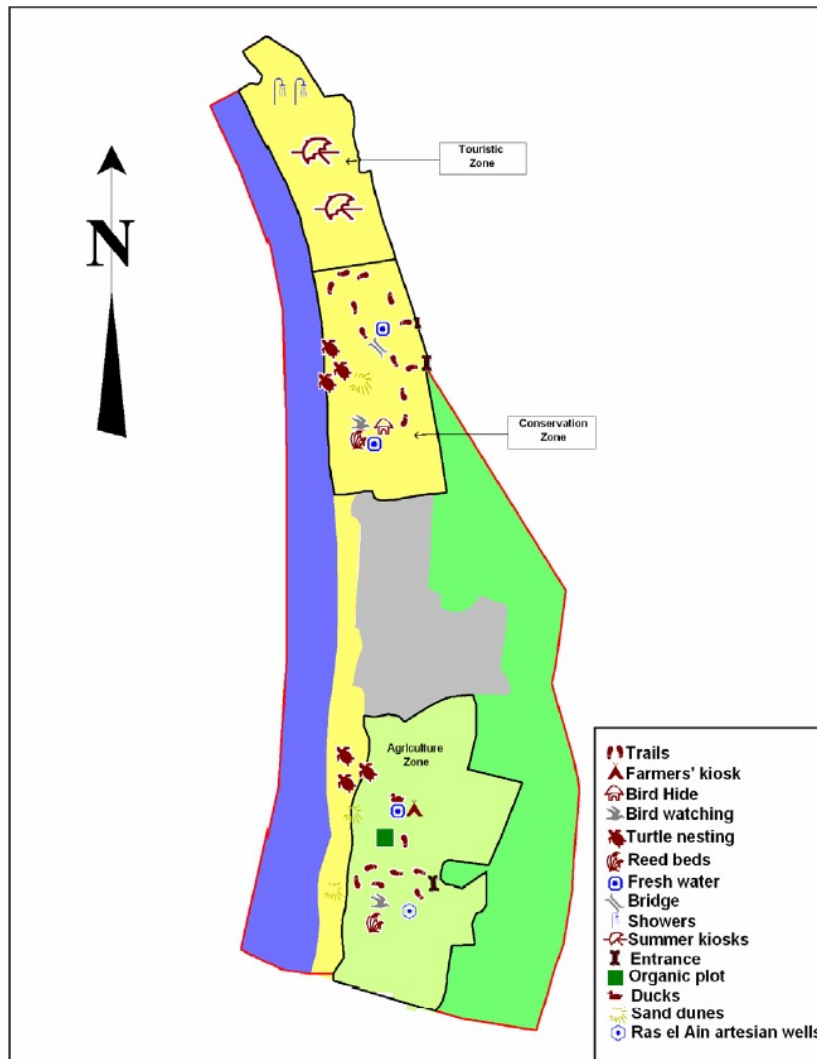
1. The Ministry of Agriculture (MoA) is liable for the management of the agriculture land, however, currently the MoA does not have an active role in TCNR;
2. The Ministry of Public Works and Transport (MoPWT) oversees all beaches in Lebanon;
3. The Ministry of Culture (MoC), through the Directorate General of Antiquities, oversees all archeological and historical sites, including that of Ras el Ain which is a part of TCNR;
4. The Municipality of Tyre has the right to use the tourism zone in Section E1 throughout the summer season (According to the Law 708/1998 concerning the establishment of the TCNR), on the basis of a yearly agreement with the TCNR committee and the approval of the Minister of Environment;
5. The Ministry of Power and Water (MoPW) is mandated to supervise and manage the use of the groundwater resources in TCNR;
6. The Litani Water Authority is authorized to manage the water in Ras el Ain for irrigation.

Many institutions are a fundamental part of TCNR management, since each has a different role and level of responsibility. Organizations that are mostly in charge of the direct management of the site, including the preparation and the approval of the management plan are:

- Ministry of Environment: Overall supervision of the reserve and endorsement of the management plans (the last management plan was prepared for TCNR in 2006 by the MedWetCoast project).
- Appointed Protected Area Committee (APAC): Appointed through a decision by the Minister of Environment to ensure the Local management of the reserve under the supervision of the Ministry of Environment. This committee comprises five volunteers representing the Municipality of Tyre, Governor of the Tyre district, two local NGOs, and the Ministry of Agriculture.
- Tyre Municipality: Management of the tourism zone in Section E1 during the summer season through an annual contract with the TCNR committee after the approval by the MoE.

## 6.3. Zoning and activities

TCNR is divided into three zones: Touristic zone; Agriculture Zone; and the Conservation Zone (**Map.11**). The Rachidiyeh Camp interrupts the reserve between the agriculture and the conservation zones. The reserve includes also a marine zone (the sea) which extends over 12 nautical miles facing the TCNR's terrestrial zones.



Map 11. TCNR Map including three zones: (from the bottom & up) Agriculture Zone, Conservation Zone, and Touristic Zone.  
Source: (Ministry of Environment, 2016)

1. **Touristic Zone:** The TCNR touristic zone is mainly working during the summer for 4 months, where 50 eco-friendly kiosks operate as restaurants and bars to serve the tourists. According to the Tyre Mayor, there are during the summer season 20,000 people visiting the Tyre public beach on Sundays, around 15,000 visitors on Saturdays and 10,000 on weekdays. The Tyre beach area typical season extends over 18 weeks- therefore, a monthly average of 375,000 people (NAHNOO, 2019). The proceeds from rent fees paid by these kiosks and from the parking fees to the Tyre municipality serve partly as a funding source for the TCNR management (45% of the total fees).
2. **Agricultural Zone:** The TCNR agricultural zone is very fertile and has been cultivated since the Roman times. This zone extends over 170 hectares along the coastline, and is worked by both Lebanese and Palestinian farmers mainly, and by Syrians. The main crops include vegetables such as lettuce, onion and eggplant. Palm and citrus plantations are

planted further back, with walls around the fields and plantation perimeters or else windbreaks made of cane. Irrigation is by raised concrete channels from the artesian wells, and ditches running along the fields' boundaries. At Ras Al Ain, there are three artesian wells whose walls were constructed by the Phoenicians, as well as other small springs. The freshwater springs of Ras Al Ain feed 1500 liter per second into three striking pools. The off-flow creates small areas of marshland attractive to amphibian and water birds such as ducks, crakes, coots, etc. (SPA/RAC - UNEP, 2011). Some nesting sites of sea turtles can be found in the agricultural zone. The agricultural zone has a walking trail that reaches the artificial fresh water pond in it.

3. **Conservation Zone:** The reserve's scientific zone represents a transit site for migrating birdlife. The area preserves 170 endemic plants of the Lebanese coast. Moreover, it is an important nesting site for sea turtles. This zone has an educational walking trail and a bird hide for bird watching.

## 6.4. Challenges

The challenges facing TCNR are listed in the table below (**Table 5**), showcasing the different challenges per category (environmental, economic, and social).

## 6.5. Projects implemented in Tyre and TCNR

There have been 19 projects implemented so far in Tyre which directly or indirectly have had an impact on TCNR

(**Annex. 3**). The projects' timeframe varied and work started to be implemented in 2005 and some projects are ongoing today. The recurrent funders are the Italian Ministry of Foreign affairs, the European Union, Med PAN, ENI CBC Med Programme, AFD and FFEM. As for recurrent implementers, these are the: TCNR, SPA/RAC, and IUCN. The main topics covered focused on environmental conservation; socio economic empowerment of the fishing community and introduction of sustainable fishing; monitoring and rescue of marine turtles; infrastructure and equipment; and coastal management improvement.

Table 5. Challenges facing the TCNR.

Challenges	
Environmental	TCNR is an integral protected area around a crowded city (SPA/RAC - UNEP/MAP, 2013).
	Presence of unsustainable agricultural practices <b>which are harming the soil and are killing non-targeted species when pesticides are used</b> (SPA/RAC - UNEP, 2011).
	Littering, stepping, digging and umbrella fixing on the sandy beach of TCNR threaten the breeding and nesting habitat of sea turtles and <b>contribute to the decline of these globally threatened species</b> .
	Illegal fishing practices which <b>impact the life at sea outside and within the TCNR area</b> .
	Compression and flattening of some sand dunes by bulldozers in the past to create a parking for the reserve. This <b>destroyed not only part of the sand dunes' valuable habitats but it also damaged part of the aesthetic landscape of the reserve</b> .
	Waste disposal is in open dumpsites near the seashore, practiced by three existing Palestinian refugee camps. There is one principal dumpsite located 200m south of the Ras El Ain springs where waste from the Tyre city is dumped and <b>threatens the groundwater that feeds the wells and therefore, the freshwater that is supplied in the reserve</b> .
	Refugee Settlements of Rachidiyeh and Jal el Bahr have trespassed on natural areas (beach) while other informal settlements have used lands that ought to be protected for their environmental, agricultural and/or archaeological heritage. Due to the <b>lack of basic infrastructure and services including sewer systems and proper solid waste management practices, these camps can have possibly important and irrevocable impacts on Tyre's natural environment</b> (CRI, Debs, ECODIT & IAURIF, 2015).
Social	Increasing number of tourist visitors pose a threat to the reserve as <b>no carrying capacity studies were conducted to control the number of visitors to TCNR</b> .
Economic	Lack of stable income sources that could cover the administrative expenses of TCNR throughout the year. This undermines the capacity of TCNR to hire more staff to better manage the reserve.
	Big farmers have taken over the reserve's agricultural zone without referring back to the reserve especially for paying rent fees.







## 7. FIELD WORK RESULTS

### 7.1. Key Informants Interviews

The KIIs objective was to understand the perceptions of key local and national stakeholders of the relationship between local economic activities and coastal/marine resources management and conservation, in addition to the stakeholders' relationship and dynamics. The KIIs results summarize the information collected from 16 key informants distributed according to their organization type as follows: 3 governmental, 1 municipal; 3 from the fisheries sector; 5 from the tourism and recreational sector; 3 non-governmental organizations; and 1 nature reserve. Due to Covid-19 safety measures, some KIIs were done live and others were conducted through online calls between August and September 2020, with interview duration ranging between 40 and 70 minutes. A KII guide was used as a set of open-ended questions revolving around the tourism and fisheries sectors in Tyre and TCNR (Cf. **Annex.1. Key Informants list and KIIs guide**). After data transcription and coding, KIIs results were analyzed using qualitative data techniques based on content and trend analysis to identify patterns of convergence (or divergence) between the different stakeholders in mainly the tourism and fisheries sectors in Tyre and TCNR.

#### 7.1.1. Perception of the environmental state of Tyre and TCNR

The environmental state of Tyre and TCNR is perceived by most of the KIIs participants as distinguished through its rich marine and terrestrial biodiversity. The reserve is important for birds and as a nesting site for sea turtles and it has the last remaining coastal sand dunes' ecosystem in Lebanon. "Sea turtles are a treasure for the city" said one interviewee, they are attracting people to Tyre from Lebanon and from abroad. However, different forms of pollution and overfishing/illegal fishing are negatively affecting the fish stocks and putting marine biodiversity in danger. The municipality of Tyre is collaborating with TCNR and IUCN to regulate illegal fishing based on

the reserve law and the MoA legal frameworks for the fisheries sector. In addition to its impact on biodiversity, illegal fishing threatens the health of many fishermen diving with dangerous equipment. According to a marine biodiversity and diving expert "it is true that fishermen using unsafe diving techniques make additional profits, however they will spend more money on medical expenses due to increased health problems. From the 300,000 LBP additional profit they make in each unsafe dive, they might spend 180,000 LBP on medication expenses".

Other illegal fishing practices are used such as dynamite (nitroglycerine) that is easily obtained/accessed by anyone. However, since its supplier gets arrested, dynamite use in illegal fishing has been under control. According to one of the KIIs participants, a comparison between two underwater biodiversity assessments done in 2013 and in 2017 in the same area, showed that throughout the years there was less blast fishing. This decrease allowed the studied reefs and habitats to recover in terms of fish size and abundance. However, the development projects targeting the fisheries and biodiversity sectors are encouraging fishermen to increase the size of their fishing nets' openings and to respect the fishing law, as well as TCNR regulations for the sector. However, one of the interviewees pointed out that every time anyone tried to enforce any of the regulations on the fishermen of Tyre, they used any possible argument (sectarian, religious, economic, political...) to avoid and not comply with the regulations.

One of the interviewed fishermen stated that now the turtles, with all the campaigns and projects implemented, are being protected and supported more than the fishermen themselves. The fishermen resent the sea turtles as they break their nets if caught in them.

**Table.6** summarizes the patterns of conversions and diversions of the different perceptions of the environment shared by the KIIs participants.

Table 6. Patterns of conversions and diversions of the positive and negative perceptions of the environmental state of Tyre and TCNR

Perception type	Environmental state perception	Governmental	Municipal	Fisheries Sector	Tourism Sector	NGOs	TCNR
Positive	The geographical location of Tyre in a none-industrial zone with no industrial waste dumped at sea, explains why the <b>sea in the south is cleaner than in other regions in Lebanon</b>					X	
	Tyre has a <b>rich marine biodiversity</b> and TCNR is contributing to its protection	X	X		X	X	X
	There is an increase in <b>environmental awareness</b> of people in the past 5-10 years		X				
	MoA with the support of the Tyre municipality and in collaboration with INGOs and local NGOs is working on <b>law enforcement in the fisheries sector</b> and on promoting sustainable fishing. Patrol fishing boats used by the municipality are reducing the incidence of illegal fishing	X	X			X	X
	TCNR is looking to make the 49 tents in its <b>touristic zone environmentally-friendly</b> (installation of solar panels, dimming their lights at night, sorting solid waste, treating wastewater, etc.)				X		X
	<b>Decrease in mortality rate and injuries of sea turtles</b> due to forbidding Jet Skis in Tyre sea					X	
Negative	Lack of fish biodiversity and decrease in the fish catch due to <b>illegal fishing practices</b> outside and inside the reserve	X					
	<b>Solid waste and wastewater</b> from Rachidiyeh refugees camp are discharged into the sea	X		X			
	<b>Illegal fishing and/or overfishing</b> is practiced at Rachidiyeh refugees camp, by some fishermen in Tyre and by fishermen in other neighbouring regions that come and fish in Tyre			X	X	X	
	<b>Littering on the beach</b> is still practiced, especially during the touristic season	X		X	X		
	<b>Wastewater leakages</b> from the emptying of underground wastewater tanks for the 49 tents at the touristic zone of the reserve				X		
	<b>Lack of knowledge and attitude</b> of the people who believe that the reserve is only on the shore and not in the water; some do not even know that there is a reserve.			X	X	X	

The governmental stakeholders (Ministries of Environment, Agriculture, and Tourism) have a balanced perception regarding the environmental state in Tyre and TCNR, with three negative issues and three positive issues. The municipality of Tyre and TCNR expressed only three positive points, whereas the fisheries sector expressed four negative points. The tourism sector stakeholders tend to look more at the negative state

with four points mentioned, and have less positive perception with 2 points mentioned. As for NGOs, they tend to look more at the positive state with four points mentioned, and have less negative perception with 2 points. The rich biodiversity of the area and the efforts to enforce the fishing law are among the most shared positive perceptions of different stakeholders, except for the fisheries sector.

### 7.1.2. State of the tourism and/or fisheries infrastructure in Tyre and TCNR

The main point mentioned by the KIIs participants in the tourism sector, was the lack of a signage plan from the city entrance to the different entrances of the reserve to guide people and give them information about it. There is also a lack of signage inside the reserve, especially in the touristic area, which could help in introducing the reserve to the visitors specially as most of them are not aware that this zone is a nature reserve and

consider it mainly as a public beach; and in providing guidance for the best practices to be adopted by the visitors. In the fisheries sector, the main issue raised in terms of infrastructure by KIIs participants was the fish wholesale market that was established through a development project and was never opened for management and technical reasons. Another issue is the increasing number of recreational boats taking the place of fishing boats in the port. The table below summarizes the state of the different infrastructures in the tourism and fisheries sector in Tyre and in TCNR mentioned by the KIIs participants. (**Table.7**)

Table 7. State of tourism and fisheries infrastructure in Tyre and TCNR according to Key Informants

Tourism Sector	<b>Lack of signage plan outside and inside the reserve sections</b>
	The <b>wooden platform</b> , installed by a project on top of the pond in the Ras el Ain area in TCNR for sightseeing was not well maintained and is now hazardous for trespassers, as well as the wooden kiosks provided by a project to serve as "bed and breakfast" are not functional.
	There is <b>no central tourism office for the City of Tyre</b> that helps and links all stakeholders in the tourism sector. Currently, the Tyre municipal police are helping out visitors in a non-formal way, especially in terms of showing them the way to some sites and services
	The guest houses that were initiated and rehabilitated by a project using houses of the local communities surrounding the reserve, were not sustained and are not operational anymore.
	Some infrastructures and equipment provided by projects for the TCNR are not being used in a systematic way (Diving and snorkeling equipment, diving trail, marine turtles rescue centre...)
	Despite being a touristic city, Tyre is not provided with enough <b>electricity</b> – compared to Beirut
	<b>Parking</b> in the touristic zone ensures good financial income for the Tyre municipality and TCNR
	The <b>recycling and sorting</b> facility in Ain Baal has stopped. However, a new operator will soon take over
	Exudate infiltration from the <b>waste dumpsite</b> is possibly reaching the ground water and polluting it
	The <b>wastewater treatment facility</b> of Tyre city was operational for a short period of time, but its management and operation did not last long and needs rehabilitation
Fisheries Sector	Water of Tyre comes from the Ras El Ain springs, its source is deep in the ground and is clean, but the <b>water canals</b> network needs to be rehabilitated
	Absence of <b>Cinemas and Theatres</b> in Tyre, except for seasonal artistic initiatives
	The newly established <b>Fish wholesale market</b> in Tyre is not functional at the moment due to management and technical reasons
	Tyre <b>port is well protected in winter</b> and vessels are not affected
	Tyre municipality had to increase the <b>port size</b> to accommodate the increasing number of boats, <b>especially recreational ones</b>
	<b>Port sea water is very polluted</b> from the discarded diesel and other effluents used for fishing and recreational boats
Tyre Municipality monitors and controls the fishing practices with its <b>patrol boat</b>	
Many <b>assets provided to TCNR by projects</b> are still not being used and need maintenance	

### 7.1.3. Contribution to local economic development

The direct economic returns provided by TCNR are mainly from tourism and agriculture, in addition to the different ecosystem services that have an indirect use value (such as provision of household and drinking water from the Ras El Ain Spring) or existence value (such as biodiversity)<sup>7</sup>. This socio-economic study depicts the contribution of different economic sectors and TCNR to local economic development in Tyre as perceived by relevant local and national stakeholders.

#### Tourism sector

The tourism sector is definitely the biggest contributor to the local economic development in Tyre, especially during the summer season. However, the absence of up-to-date official statistics and tourism accounts on the national, regional and local level make the estimation of the tourism contribution to economic development difficult. According to the KIIs participants, accommodation facilities and restaurants are the sources of income for the tourism sector in Tyre. In the last five years, the city has become a very trendy destination due to the establishment of different accommodation facilities targeting many segments of the market. Today, there are more than 25 accommodation facilities in Tyre and its surrounding area; they include guesthouses, boutique hotels, hotels, beach resorts, furnished apartments, and Airbnb apartments. All these facilities were developed by private sector investments.

Despite the vibrant tourism sector and its multiple and diverse services, tourism activities and attractions in Tyre remain concentrated in four main areas:

- 1) The Christian quarter (that hosts the majority of guesthouses and boutique hotels);
- 2) the sandy beach and touristic zone of the reserve (that hosts the tents/restaurants during the summer season);
- 3) Tyre rest house and the cafes and restaurants in front of the corniche adjacent to the Rest House; and
- 4) to a lesser extent the main Roman archeological site (Hippodrome of Tyre).

According to two KIIs participants, this concentration of tourism services raises a concern as to whether the income from tourism is being fairly distributed amongst the local community of Tyre. For instance, the old town boutique hotels and luxury guesthouses do not benefit local stakeholders such as fishermen, since they buy fish from middlemen who make most

of the profit. Another concern is tourism income leakages due to external investments in the area, especially with the large scale beach resorts.

#### Fisheries sector

Similar to most of the coastal areas in Lebanon, fishermen are considered to be amongst the poorest and most vulnerable community members in Tyre. According to key informants, there are around 5,000 people in Tyre relying on fishing as their main source of income; these families include both Lebanese fishermen and Palestinians operating fishing boats owned by Lebanese. The difficult economic situation and the deteriorating living conditions of fishermen, push many of them to practice illegal fishing and/or overfishing just to provide for their families. At the national level, Lebanon imports 80 % of its demand of fish and only 20 % is supplied locally – benefiting mainly fishmongers and middlemen.

The low supply is mainly due to the decrease in fish stocks due to pollution, overfishing, and illegal fishing. Some of the fishermen, to increase and diversify their income source, have shifted their practices in the summer from fishing to providing recreational boat tours. According to one of the KIIs participants, this might lead some fishermen to leave the sector and convert their boats and/or buy new boats used in the recreational sector. Interestingly, a one-day income from a tourism boat equals 5 to 10-days income from a fishing boat. However, the recreational and touristic boats sector is not well organized in Lebanon. To be allowed to take tourists out to sea, a boat should get a licence from the Ministry of Public Works and Transportation, be equipped with life jackets and fire extinguishers, and have a special insurance policy. These rules and regulations are not always applied, and in some cases non-registered boats do organize tours. Furthermore, favouritism plays a role in granting permits for people to operate touristic boats. The fish wholesale market established in Tyre can give a much fairer price for the fishermen's catch by decreasing and/or removing the fishmongers' share (intermediaries between the fishermen and the retail market). The fish size and type would be checked at the wholesale market and the MoA would take care of a minimum food safety and hygiene standard. However, nowadays if a wholesale market is established, and with the fish price increase benefiting mostly the fishermen, it will still be not enough according to one of the interviewees, to cover the running costs the fisherman have to pay for, as prices are still in \$ USD like boat maintenance, nets, equipment, etc.

<sup>7</sup> A comprehensive economic valuation study for TCNR, including the different ecosystem values, was conducted in August-September 2020.

## Tyre Coast Nature Reserve

The touristic area of TCNR is the main contributor to local economic development in the area. The management of this area and its economic return are shared between TCNR, the Tyre municipality and the private sector (mainly tent owners). Each year, the municipality of Tyre requests the TCNR committee's permission to exploit its touristic section through the installation of tents used as rest areas and restaurants for the sandy beach visitors during the 4-months summer season (June to September). Before granting this permission to the municipality, TCNR gets the approval of the Ministry of Environment, the public administration responsible for the management and supervision of Nature Reserves in Lebanon. Once all approvals and permissions are granted, the municipality of Tyre launches a bidding process for potential tent owners/operators<sup>8</sup>. This process is done annually before the summer season through a contract between the Tyre municipality and the TCNR committee, which states that the municipality transfers 45 % of the total revenues from the kiosks rental to the reserve committee.

Each tent owner pays a monthly fee of 600,000 LBP to the municipality, which in turn employs around 40 people in the touristic zone to manage the parking, ensure the cleaning of the beach and secure the area. On average, each tent employs 3 workers during the summer season, thus the touristic section of the reserve ensures around 150 seasonal jobs for young men and women originating from Tyre and the surrounding area. At the end of the season, the municipality accounts for the tent rent, the parking earnings (a big income source) and provides 45 % of its net profit to TCNR (estimated at around 217 Million LBP in 2019) which is used for TCNR's operational costs. According to the municipality figures (not official statistics), there are around 200,000 to 250,000 people visiting the sandy beach of Tyre every year (many of them are repeaters who visit the area several times in one season)<sup>9</sup>. One of the tent owners who participated in the KIIs mentioned that 10 % of the sandy beach visitors do stay for at least one night in Tyre. In 2017 and 2019, the Tyre beach was listed among the best beaches and summer destinations in the Middle East by CNN and National Geographic.

As part of TCNR, the Ras El Ain area should not have any human activities according to the nature

reserves law in Lebanon. However, this area has been historically used for agriculture given its fertile land and abundance of water. After the creation of TCNR, agricultural activities continued in the Ras El Ain area as a fait accompli. Despite being public properties, Ras El Ain lands are controlled by a few persons who rent agricultural parcels to Lebanese farmers and Palestinian refugees from the Rachidiyeh camp. While waiting to legally solve the land property/control issue that seems to be complex and influenced by socio-political factors, the TCNR management team has not allowed farmers throughout the years to plant fruit trees to avoid further complications. Moreover two years ago the TCNR team started to work with the farmers and to collect data on their agricultural practices in order to convince them to shift to a more sustainable agricultural system in order to be compatible with the reserve and reduce the negative impact on the environment.

### 7.1.4. Relationship between tourism and fisheries sectors

According to the KIIs participants, TCNR can play a very important role in local economic development as it can work on leveraging different sectors such as fisheries, tourism, and natural/cultural heritage. It can be the catalyzer to create synergies between economic and livelihoods activities of the region, socially through the creation of thematic tourism packages inside and outside the reserve benefiting different tourism service providers. This kind of integration between tourism and other local economic activities proved to be beneficial and to create a win-win situation in other reserves in Lebanon such as the Shouf Biosphere Reserve and the Jabal Moussa Biosphere Reserve, hence it is still not exploited in Tyre and necessitates better coordination between relevant stakeholders. Consequently, the tourism sector can support the fisheries sector by integrating fishermen into some recreational activities such as using their boats for tours in the sea. As a general initiative on the national level, the MoA is currently studying the possibility of involving fishermen in activities other than fishing in order to provide them with additional sources of income. However, the present legal framework is not flexible in this regard.

<sup>8</sup> According to the last management plan of TCNR developed in 2006, 49 tents are allowed to be temporarily installed on the sandy beach during the summer season.

<sup>9</sup> The highest number of visitors is recorded during weekends; it can reach 20,000 visitors on Sundays. There are no statistics on the origin and profile of these visitors, neither the pattern of their visit. For instance, no one is able to provide figures on the number of people who visit the beach and stay overnight in Tyre.

### 7.1.5. Challenges facing the tourism and/or fisheries sector today in Tyre and TCNR

The KIIs identified the following main challenges for the **fisheries sector**:

- Absence of an effective syndicate and cooperative work to safeguard the fishermen's rights and support them in dealing with their daily problems such as the increased prices of nets, hooks, and maintenance costs - to list just a few;
- Socio-political influences and favouritism which do not lead to any improvements in the sector;
- Increase in the running costs of fishing (boat maintenance, boat paint renewal, fuel, motor fixing, oil change...) due to the economic crisis and currency devaluation;
- With decreasing fish stocks many fishermen are no longer willing to abide by the 500m shore distance regulation, the reserve rules and restricted areas for fishing, and continue practising illegal fishing methods to provide for their families.

As for the **tourism sector**, the main challenge mentioned during the KIIs is:

- Decreasing number of tourists due to covid-19 lockdown and the economic crisis, especially to main stream and conventional tourism service providers (hotels and restaurants).

Regarding the **TCNR**, the main challenges are:

- Lack of assets management: with the high number of projects implemented, there are a lot of assets that are left idle at the reserve due to the lack of maintenance and proper management;
- The reserve also suffers from a lack of staff to run the different parts of the reserve in a sustainable manner, and to keep in touch with the reserve stakeholders;
- In the Ras El Ain agricultural and conservation zones are a lot of trespassers, especially from the Rachidiyeh camp and irresponsible visitors, that either leave litter in the zone, start camp fires

affecting turtles' nests, and/or hunt near the Ras El Ain ponds;

- The agricultural zone although part of the reserve property, is being currently "overtaken" by powerful people that rent the land to small farmers. The reserve is not part of such a mechanism and has no direct control over the farmers' practices, especially when it comes to the use of pesticides and fertilizers in the reserve lands and its fresh water sources;
- Weak community mobilization and engagement. Many people do not know about the reserve and therefore they are not involved in protecting and keeping it clean. Even some tourists who go to the touristic zone during the summer season are not aware that this zone is a nature reserve and consider it just as a public beach.
- Excessive number of tourists in the touristic zone during the summer season, and many of them are littering on the beach and in the sea.
- Wastewater leakages into the sea and solid waste dumping at the coast near the sea.

The table below presents the full list of challenges facing the fisheries and tourism sector, as well as the TCNR, as mentioned by the KIIs participants. (**Table.8**)

### 7.1.6. Perception of the tourism and fisheries future in Tyre and TCNR

**Table.9** presents the perceptions of different stakeholders consulted in the KIIs on the future of tourism, fisheries sector and TCNR.

Cooperation and coordination mechanisms between TCNR and local stakeholders are amongst the most important issues to be developed in Tyre as perceived by the majority of the consulted key informants, in addition to reinforcing the TCNR management (staff and procedures). For the tourism sector, better organization of the value chain and promotion is needed in the future. As for the fisheries sector, the legal framework and solution for the social, economic and environmental problems of the sector are the most important issues to be tackled in the near future.

Table 8. Challenges facing the tourism, fisheries sectors and TCNR according to the KIIs

Perception type	Environmental state perception	Governmental	Municipal	Fisheries Sector	Tourism Sector	NGOs	TCNR
Fisheries Sector	Fishermen are left alone with no effective syndicate and no cooperative work			X			X
	The running costs for fishermen is very high these days due to the economic crisis	X		X			
	Focus is put on safeguarding turtles and sea biodiversity, there is not much effort placed on supporting the fishermen			X			
	Restrictions on the fishing area are not very applicable as outside the 500-meter limit there are strong waves and wind and there are security restrictions imposed by the Lebanese Army			X	X		
	Amateur fishermen are taking the fish stocks from professional fishermen. The amateur fishermen are not all legally registered, they do not pay for fishing permits and to register their boats and the majority of them do not respect the law and the safety measures			X			
	Fishermen usually feel threatened when organizations such as TCNR and the Tyre municipality talk about sustainable fishing and safeguarding marine biodiversity. They believe that these discussions and awareness sessions lead to the enforcements of further restrictions on them and on the fisheries sector without providing alternative solutions			X			
	Around 75 % of the fishermen are indebted to the fish selling shops and fishmongers					X	
	Traceability about fish catch (volume and type) is missing and data on the number of boats/ fishermen is not up-to-date					X	
Tourism Sector	Mainstream tourism service providers were mostly affected by covid-19 and the economic crisis. The number of tourists in Tyre decreased and many people are bringing their food with them and not eating at the city restaurants	X		X	X		
	The cultural heritage of Tyre is not promoted as it should be				X		
	Pricing challenges adapting to the economic crisis				X		
	Lack of cooperation between different tourism service providers and lack of tour operators in Tyre to create package deals				X	X	
	No vision in the medium to long term on structuring the tourism sector, improving its services and diversifying its activities					X	X
	No access control and unified booking system for boat tours					X	X
	Security concerns in South Lebanon due to tension on the borderline					X	X
TCNR	Lack of assets management: with the high number of projects implemented, there are many assets (diving gear, snorkeling equipment, compressor, plan and infrastructure for the underwater trail, equipment for the marine turtles rescue centre, kiosks for bed and breakfast etc.) that are left idle at the reserve due to a lack of maintenance and proper management	X			X	X	X
	Lack of staff to run the different parts of the reserve, to keep in touch with the reserve stakeholders	X			X		X
	Weak community mobilization and engagement. Many people do not know about the reserve and therefore are not involved in protecting it and keeping it clean	X		X	X	X	
	Tourists and visitors trespassing in the agriculture and conservation zones	X				X	X
	The agriculture area has been taken over and there are uncontrolled agricultural activities	X				X	X
	Security limitations in the Rachidiyeh camp, separating the conservation zone from the agriculture zone of the reserve	X					X
	Some tourists and fishermen are harming the turtles and are littering on the beach and at sea			X			
	Lack of proper access control and clear separation between the different zones and their use					X	
	Infrastructure issues at the reserve office						X
	Wastewater leakages and solid waste dumping at sea						X

Table 9. KIIs perception of the future of tourism, fisheries and TCNR

Sector	Sectorial Future Perception	Governmental	Municipal	Fisheries Sector	Tourism Sector	NGOs	TCNR	
Fisheries Sector	Provision of solutions and alternative economic opportunities for the fishermen: e.g. specific fishing areas closer to the seashore, integrating them in the tourism sector and supporting them in finding alternative activities such as recreational boat tours, fishing nets production, food and culinary tourism, etc.	X						
	Better cooperation between MoA, TCNR, syndicate, and cooperative to support fishermen in the implementation of the fishing rules and regulations and providing them with the necessary equipment to abide by the law	X		X				
	Study the potential of sea food processing and packaging such as sardines	X						
	Study the potential of introducing aquaculture and fish farms					X		
	Create underwater nursery zones to increase fish abundance and to improve the catch					X		
Tourism Sector	Create and promote innovative tourism packages based on market studies and market demand	X						
	Establishing a scuba diving, nautical skiing, and surfing school promoting environmental-friendly water-based tourism activities. These activities can be led by the children of fishermen, or the fishermen themselves.	X	X			X		
	Create a Destination Management Organization (DMO) for the Tyre region				X		X	
TCNR	The reserve should build strong partnerships and cooperation mechanisms with local stakeholders and engage local communities in its mission and activities: <ul style="list-style-type: none"> <li>Collaborate with farmers in Ras El Ain to adopt organic agriculture practices. TCNR can help farmers and local food producers to sell part of their product under a special brand name</li> <li>Coordination and cooperation with tourism operators, especially tents on the sandy beach, about their concerns on the regulations imposed such as light dimming, music volume decrease, distance from the water; and with fishermen on their concerns abiding by sustainable fishing practices and turtle protection activities</li> <li>Ecotourism should be more developed: marine turtle museum (already established but not operating on a regular basis), eco-trails, underwater trail and recreational diving, scientific research, ecological camping.... This will highlight the reserve mission, it will promote sustainable development and provide the reserve with a stable source of income that would sustain its operational costs for the whole year</li> <li>Increase visitors' awareness about the reserve, its mission and activities</li> </ul>	X		X	X	X	X	
	Improve access control to the reserve zones, real-time data collection, and tourism market research	X						
	Establish a scientific marine biodiversity centre and rescue unit in Tyre which could be the main turtle rescue centre in Lebanon for any turtle injuries. The Centre has been established with SPA/RAC's support but is currently not operational in a systematic way and needs upgrading with dedicated experienced staff and space/equipment to be properly functional and operate as a rescue centre.			X				X
	Improve the management structure and procedures of the reserve. The reserve staff should be able to carry out daily activities related to the management of the reserve regardless of externally funded projects			X		X		
	A scientific team should be employed at the reserve and be present at all times: marine biologist, scientific expert. They will be able to monitor the sea and coastal biodiversity and work with the fishermen on implementing sustainable fishing among other tasks.			X				
	Borders between the touristic and the conservation zones with access control and monitoring should be established			X				X
	Increase staff capacity and knowhow in different fields: conservation, tourism, local development, community mobilization. Moreover, during summer seasons, more guides, guards and cleaning workers are needed in the tourism zone in order to: guide the visitors and tourists and provide info on the reserve and its allowed and prohibited activities, control the violations, stop marine littering on the beach and in the sea, and regularly remove the waste left by the visitors on the beach.			X	X			
	TCNR should work on their marketing and improving their website and communication channels			X				
	TCNR with the Tyre municipality should set policies and lead the green network and push people to move into environmental friendly practices and activities inside and outside the reserve				X			
	TCNR should have a presence next to the port due to the important influence of the fisheries sector on marine biodiversity. This can help in improving the relationship with fishermen and integrate them in ecotourism activities on land and in the sea							X



## 7.2. KAP survey

The objective of the KAP survey of this study is to provide information about the knowledge, attitudes and practices of the Tyre local community in relation to TCNR's state, characteristics, management, and different usage systems of its natural resources, especially those pertaining to fisheries and tourism. The studied population consists of four different groups living in the biosphere of TCNR:

- 1) Fishermen and fisheries operators,
  - 2) Individuals and organizations working in the tourism sector,
  - 3) Farmers cultivating lands in the Ras el Ain area, and
  - 4) Households living in Tyre and surrounding areas.
- The survey was guided by a questionnaire (Cf. **Annex.2 KAP survey questionnaires**).

It was conducted during the months of September and October 2020; 60 surveys were filled out in the field and 21 through phone calls due to the Covid-19 measures. Each questionnaire lasted on average 30 minutes. The following results present a synthetic analysis of the information collected from 81 surveys and distributed

as follow: 20 fishermen and fisheries sector operators; 20 tourism businesses owners and workers; 20 farmers; and 21 household members working in sectors other than tourism, fisheries and agriculture.

### 7.2.1. Demographics

**Age:** The majority of the fishermen who participated in the survey (75 %) are 46 years old and above, which shows that this community is an ageing population and that fishing does not attract young people any more. For the tourism sector, there are three main age clusters: 45 % aged between 26 and 35, 25 % aged between 36 and 55, and 25% aged between 56 and 65. The young people are mostly tourism workers, whereas middle aged people are mainly the tourism businesses owners. As for the farmers surveyed, they have an age distribution similar to the fishermen population with the majority (80 %) above 46 years. The household age distribution is the most diverse, it varied between 26-35 years old (38 %), 36-45 years old (24 %), 46-55 years old (10 %), and 56-65 years old (24 %). (Figure.3)

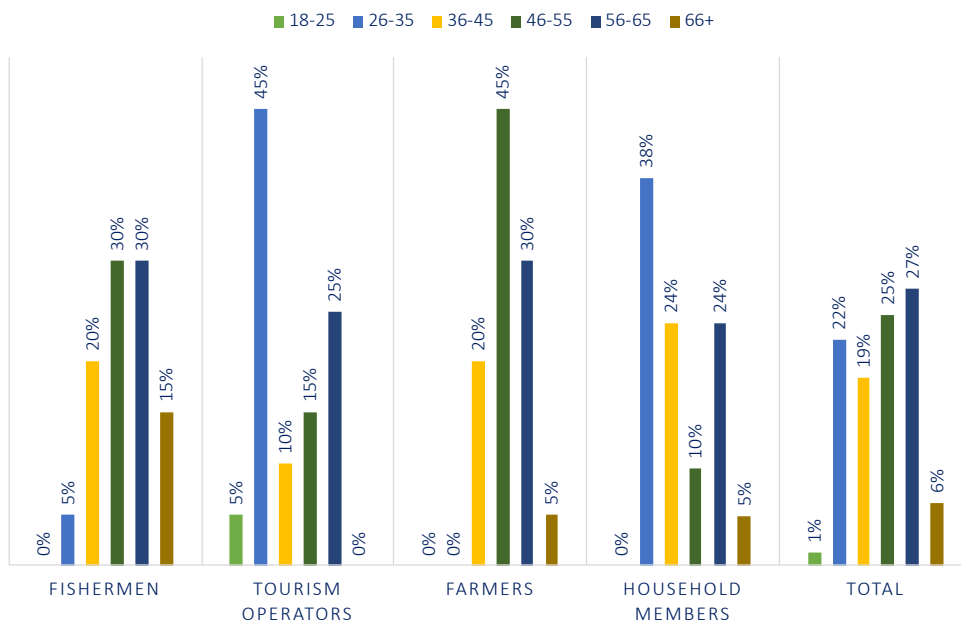


Figure 3 Age distribution of the KAP survey respondents

**Gender:** The gender distribution of the surveyed sample is male oriented with 85 %. It is important to note that the fisheries and the agriculture sector did not have any female participation and the tourism sector had 90 % male participation,

which reflect a high male dominance of most of Tyre's economic sectors. It was only in the households from Tyre that a male and female participation was almost equal with 52 % and 48 % respectively (**Table.10**).

Table 10. Gender distribution of the KAP survey respondents

Gender	Fishermen	Tourism operators	Farmers	Household members	Total
Male	100 %	90 %	100 %	52 %	85 %
Female	0 %	10 %	0 %	48 %	15 %

**Marital Status:** The majority of the fishermen are married (80 %), 40 % of the tourism operators are single, all farmers are married (100 %), and the household

members are almost equally distributed between married (52 %) and single (43 %) (**Table.11**).

Table 11. Marital status distribution of the KAP survey respondents

Gender	Fishermen	Tourism operators	Farmers	Household members	Total
Single	5 %	40 %	0 %	43 %	22 %
Married	80 %	60 %	100 %	52 %	73 %
Divorced	15 %	0 %	0 %	0%	4 %
Widowed	0 %	0 %	0 %	5 %	1 %

**Education Level:** In general, most of the KAP respondents had either primary, complementary, or university education (26 %, 22 %, and 28 % respectively). As for each of the different groups and their main education level: 25 % of the fishermen are illiterate and 45 % reached primary

education; 35 % of the tourism operators have a university degree and 55 % went to school; 45 % of the farmers attained complementary education; and 62 % of the household members have a university degree. (**Figure.4**).

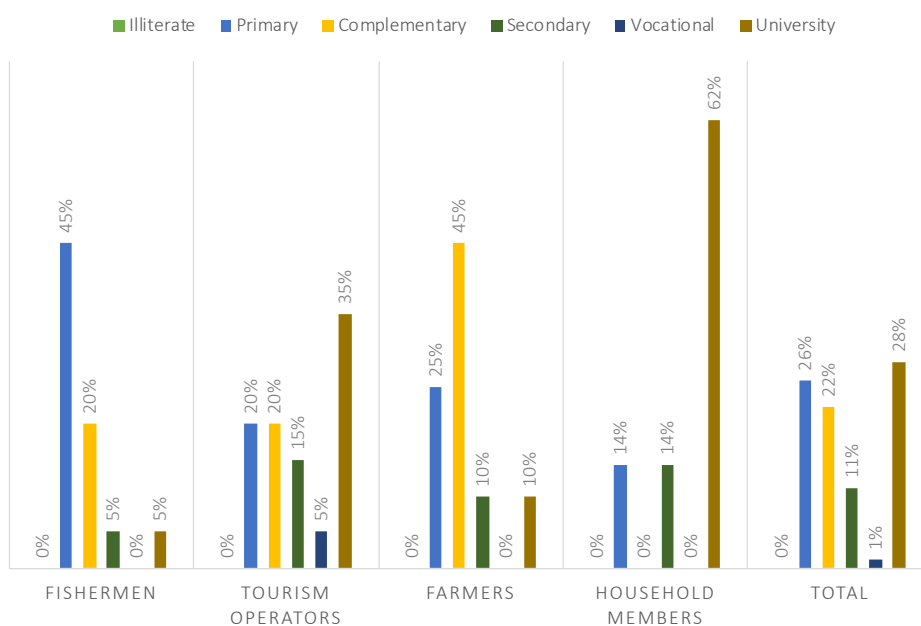


Figure 4 Education level distribution of the KAP survey respondents

### 7.2.2. Household description

**Survey respondents' geographical distribution:** More than half of the fishermen (55 %) live in the old town not far from the port. The rest of the fishermen live in Al Raml (35 %) and Al Bass (10 %), 5 minutes from the port by car. Half of the tourism operators live in Al Raml, and 30 %

live in the Old town next to the guesthouses and boutique hotels. Furthermore, 60 % of the farmers are located in Ras El Ain (Lebanese) and 40 % in the Rachidiyeh camp (Palestinian refugees) next to the agricultural lands, whereas surveyed households are equally distributed between the Old town and Al Ramel (52 %) and other areas in urban metropolitan Tyre (48 %) (**Table.12**).

Table 12. Survey respondents' geographical distribution in Tyre and its suburbs

Area	Fishermen	Tourism operators	Farmers	Household members	Total
Old town	11	6	0	6	23
Al Raml	7	10	0	5	22
Ras El Ain	0	0	12	0	12
Al Bass	2	1	0	0	3
Rachidiyeh Refugee Camp	0	0	8	0	8
Other: Borj El Chemali, Aabbasieh, Ain Baal...	0	3	0	10	13
<b>Total</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>21</b>	<b>81</b>

**Household size, dependents and household composition:**

The average household size of the 81 participants is 5 members and 3 dependents per household. Family members are equally divided between male and female. It is interesting to note at this stage that both fishermen and farmers have neither social security nor insurance which increases their household social and economic vulnerability.

**Tenure:** There are equal numbers of survey participants who live in rented or owned apartments in buildings (28 % and 27 % respectively), 23 % of participants live in owned houses, 12 % live in refugee camp settlements and 10 % live in rented houses. Of all surveyed participants, 33 % live in traditional old houses, mainly located in the old town. The majority of fishermen live in rented houses and apartments (65 %).

**Occupation:** the vast majority of the interviewed participants have one occupation in their respective sectors: fisheries, tourism, and agriculture. Only 2 out of the 20 fishermen have another occupation (1 as a small business owner and 1 as a part time employee).

Regarding household members' occupation, almost half of them are employees (33 % - full time and 19 % - part time), 28 % own a small business, 10 % are retired and 10 % unemployed.

**Household income composition:** The average household income for all respondents is 3,400,000 LBP per month. Farmers and fishermen have the lowest household income with an average of 1,130,000 LBP and 1,357,000 LBP per month respectively. Tourism sector operators have the highest household income per month with an average of 6,060,000 LBP, and other households earn on average 5,000,000 LBP per month.

**Household access to services:** the KAP survey respondents were asked to rank the quality of basic services in Tyre (from -2 very bad to 2 excellent). The results showed that drinking water, energy (electricity, and transportation were the worst services due to shortages or bad quality. Household water, solid waste and wastewater were perceived as average to good quality services by respondents. (Figure.5).

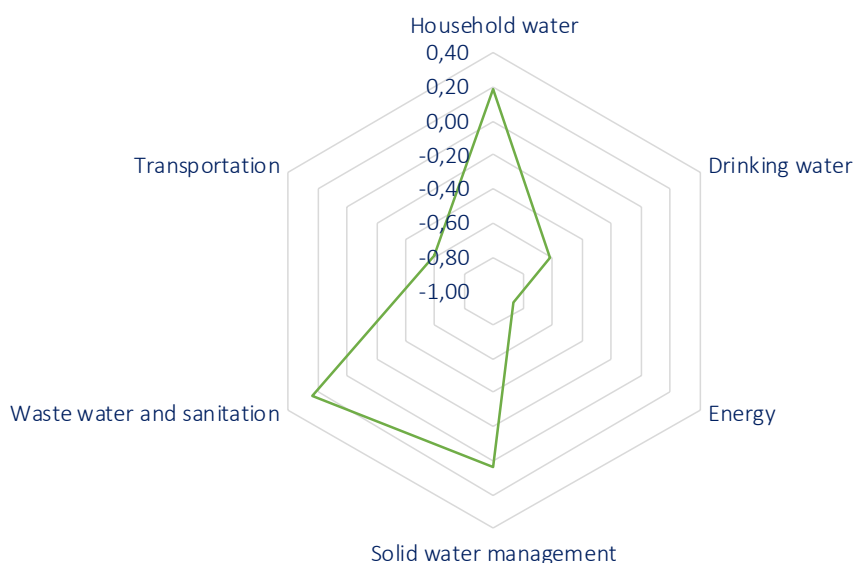


Figure 5. Quality of basic household services

### 7.2.3. Involvement in the fisheries sector

On average, fishermen start fishing at the age of 22 years, with 60 % of them having at least one family member involved in the fisheries sector. All interviewed fishermen practice wild captures. More than half of the fishermen (55 %) maintain their own equipment and tools (boats and nets mainly) and 30 % of them manufacture part of their tools (mainly nets). The fishermen explained that these days it is very expensive to hire someone else to

maintain the fishing equipment, especially boats, so they had to learn to do it themselves.

#### Membership in social networks and groups

The majority of the interviewed fishermen (85%) are neither affiliated to a syndicate nor to a cooperative. Only 15% are part of the fishermen's syndicate of South Lebanon and 5% are part of the fishermen's cooperative of Tyre (**Figure.6**).

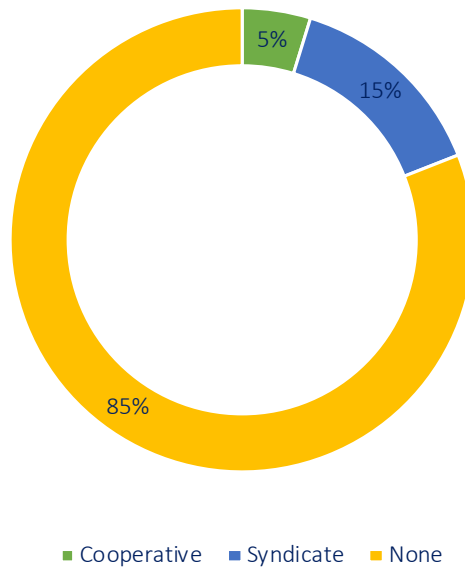


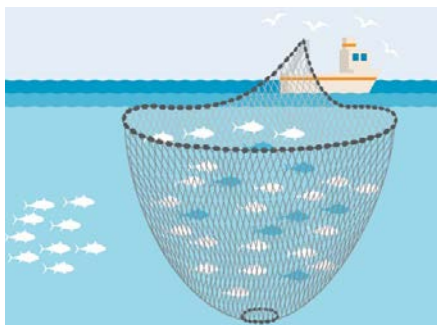
Figure 6. Membership in social networks and groups

#### Number, type, size and tenure status of vessels

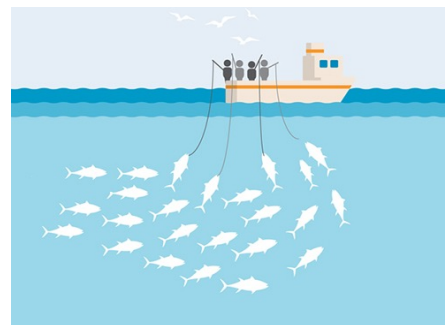
The large majority of interviewed fishermen (90%) use the traditional small Flouka boat that has an average length of 9 meters. They also own their Flouka, except for one fisherman who rents it and one who works for another fisherman. Among the 20 interviewed fishermen, there are two who own or co-own, in addition to the Flouka, a large boat used for tourism and recreational purpose (boat size between 12 and 15 meters).

#### Main fishing methods, equipment, and tools

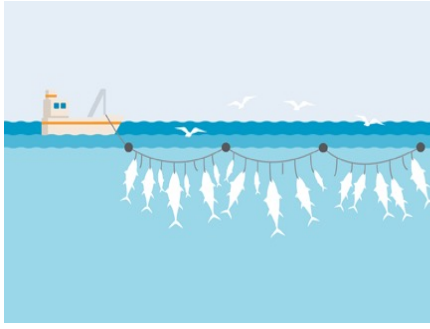
The majority of the interviewed fishermen use at least two different fishing methods. The following figures represent the different methods, equipment and tools used by Tyre fishermen who participated in the KAP survey. The most used methods are Purse Seine and Longlines (70% and 50% of the interviewed fishermen respectively), followed by Pole and line (30%). Pelagic trawl and Sea Gun fishing are the least used methods (15% and 10% of the interviewed fishermen respectively).



**Purse seine (Nets)** used by 14 fishermen  
Source: [www.msc.org](http://www.msc.org)



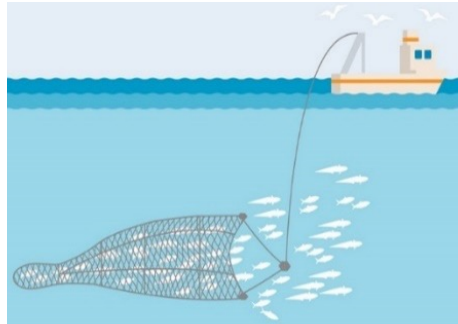
**Pole and line** used by 6 fishermen  
Source: [www.msc.org](http://www.msc.org)



**Longlines ("Charak")** used by 10 fishermen  
Source: www.msc.org



**Sea Gun** used by 2 fishermen  
Source: www.leisurepro.com



**Pelagic Trawl ("Jerjara")** used by 3 fishermen  
Source: www.msc.org

### Catch type and value

The large majority of interviewed fishermen (90%) use **Table.13** presents the most frequent catch distributed per type of fish and percentage of fishermen catching each species, as well as the average wholesale selling

price. Three out of the top 5 catch species have a high market price (44,000 to 45,000 LBP/Kg), and 5 out of the 7 species that have a low catch among fishermen have a high market price ranging between 20,000 and 50,000 LBP/Kg.

Table 13. Most frequent catch, average selling price (LBP/kg), and percentage of fishermen who catch this type.

Scientific name	Arabic name	Average Selling price LBP/kg	% of fishermen who catch this type
<i>Pagrus caeruleostictus</i>	فريدي	45,000	55%
<i>Epinephelus costae and Epinephelus marginatus</i>	لقس	44,000	45%
<i>Diplodus sargus</i>	صرغوص	17,000	45%
<i>Mullus surmuletus</i>	سلطان ابراهيم	44,000	40%
<i>Pagellus erythrinus</i>	جربيدي	16,500	25%
<i>Sparisoma cretense</i>	مليفا	30,000	20%
<i>Euthynnus alletteratus</i>	بلميدا	7,000	15%
<i>Clupeidae</i>	سردين	10,000	10%
<i>Boops boops</i>	غيص	17,500	10%
<i>Scomber japonicas</i>	سكمبري	7,500	10%
<i>Synodus saurus</i>	عرموط	25,000	5%
<i>Scomberomorus commersoni</i>	ابو سن	50,000	5%
<i>Siganus rivulatus/ luridus</i>	ابو شبكة	2,500	5%
<i>Seriola dumerilii</i>	جرو	30,000	5%
<i>Sphyaena sphyraena</i>	سرفنى	40,000	5%
<i>Caranx crysos</i>	تراخول	20,000	5%
<i>Mugilidae</i>	بورى	15,000	5%

### Catch market distribution

In the absence of an organized wholesale market, most of the fishermen sell 85% of their catch to the wholesale fishmongers market controlled by four big fish shops in Tyre. The rest of the catch goes to: 10% fishermen's household consumption, 3% direct sales to consumers, and 2% through direct sales to restaurants/hotels.

### Annual costs of fishing operation

As seen in the table below, the main annual expense is for equipment and tools' maintenance, purchase of new equipment and tools, energy/fuel and vessel maintenance. The fishermen explained that the equipment and raw material for maintenance are all priced in US dollars, thus,

they have to pay for them according to the black market exchange rate since October 2019<sup>10</sup>. A fisherman explained that nowadays, if a motor breaks down, the fisherman will have to stop his activities and will have to work in other sectors or work with his friends on their boats due to their inability to fix it or buy a new one.

The boat registration and fishing licence are paid for on a yearly basis, their fees did not change and are still in LBP (boat registration paid to the Ministry of Public Works and Transportation and licence paid to the Ministry of Agriculture. The municipality of Tyre covers part of the registration and licence fees for the fishermen. (Table.14).

Table 14. Fishing operation annual cost per Flouka

Fishing Operation	Cost in LBP per year	Percentage
<b>Vessel maintenance</b>	<b>2,512,000 LBP</b>	<b>16.9%</b>
<b>Equipment and tools maintenance</b>	<b>3,887,000 LBP</b>	<b>26.1%</b>
<b>Purchase of new equipment and tools</b>	<b>3,438,000 LBP</b>	<b>23.1%</b>
<b>Energy/fuel</b>	<b>2,993,000 LBP</b>	<b>20.1%</b>
Oil motor change	1,357,000 LBP	9.1%
Labour	600,000 LBP	4.0%
Boat registration and Fishing licence	80,000 LBP	0.5%
<b>Total</b>	<b>14,867,000 LBP</b>	<b>100%</b>

Furthermore, due to the severe economic crisis, many fishermen go out to sea nowadays in the same boat to reduce the boat ride running costs. In such cases, after deducting the fuel cost, the return from the catch is divided into equal parts: 1 for the Flouka owner, 1 for the nets maintenance costs, 1 for each fisherman on board and half for the longlines' maintenance costs. The following table summarizes the average fishing costs per Flouka on an annual basis as provided by the 20 interviewed fishermen. The purchase and maintenance of equipment and tools constitute almost half of the annual costs (49.2%), which shows how much fishermen are affected by the economic crisis.

### Participation in tourism-related activities

From the 20 interviewed fishermen, 40% participate in tourism activities through the provision of tours at sea in recreational registered boats (2 fishermen) and normal fishing boats (6 fishermen). Boats that are officially registered as recreational ones can accommodate on average 19 people. The fees for recreational tours are counted either per day (it ranges between 200,000 for the small Flouka used usually for fishing and 750,000 LBP for

the large recreational boat), or per hour with an average of 70,000 LBP per tour. Some fishermen pointed out the problem of their inability to get the official recreational licence for their small Flouka as they are already registered as fishing boats, thus their work in tourism is somehow considered illegal and they can be banned from doing it at any time.

### Challenges facing the fishermen

One of the fishermen shared that they are facing issues with the lack of parking space for their boats at the fishermen's port. Nowadays, there are some recreational speed boats (used sometimes for amateur fishing activities) that pay fishermen around 4,000,000 LBP per year to take their place. The speed boats have tourism licences from the Ministry of Public Works and Transportation, contrary to the artisanal fishing boats who have fishing licences from the Ministry of Agriculture. However, both are catching fish and are selling it, which depletes the fish stock.

Additionally, illegal fishing is still being practiced according to the interviewed fishermen. In fact, there are fishermen coming from the neighbouring ports of Sarafand and

<sup>10</sup> For many years, the LBP/\$ exchange rate in Lebanon was stable at 1,500 LBP for 1 \$. However, since October 2019, the political unrest in Lebanon and the severe economic crisis led to a huge devaluation of the local currency. At the time of the survey, the LBP/\$ exchange rate was ranging between 7,500 LBP and 8,500 LBP for 1 \$ on the black market. .

Naqoura who do not abide by any regulations; it is believed that their strong political affiliation protects them from being stopped. Other than the overfishing and the depletion of the fish stock, the sea has to deal with the threat of invasive species - as the puffer fish lays eggs twice a year compared to other fish species that lay once per year. Another fisherman added that TCNR is not able to control these practices and there is no coordination between the reserve and the surrounding municipalities and fishing ports. The monitoring Zodiac of the reserve (operated by the Municipality of Tyre) is not always in the water and it only goes out to sea during the day, while illegal fishing is practiced at night.

#### 7.2.4. Involvement in the tourism sector

The interviewed tourism operators in the KAP survey were distributed between 14 business owners and 6 workers/employees (4 full time employees and 2 seasonal employees). The latter got involved in this sector at a young age (between 18 and 25 years old). As for the tourism businesses, 4 were established in the 1980s, 6 in the 1990s and early 2000s, and 4 in the years 2013, 2018, and 2019. 60% of the respondents have at least 2 family members involved in the tourism and recreational sector.

##### Type of tourism businesses activities

70% of the tourism sector respondents are part of the Food and Beverage industry (snacks, cafés and restaurants); 20% are working or owners of accommodation facilities (boutique hotel, Hostel, and Guesthouse/Airbnb); and 10% are involved in other recreational activities (ticketing for parking and water sports). Some of the reasons mentioned for joining each of the above mentioned tourism services or activity types were:

- Accommodation:
  - Lack of facilities in the area (Owner of Guesthouse/Airbnb)
  - To host people from all over the world, especially friends and families, and to promote the beauty of Tyre (Owner of Guesthouse/Airbnb)
  - Better job opportunities and seasonal employment (Employee at an accommodation facility)
- Food and Beverage:
  - Family business, it goes from generation to generation (Lebanese restaurant owners)
  - Passion about the sector and hospitality (Lebanese restaurant owners and bartenders)
  - Job availability that does not require an educational degree (Lebanese restaurant employees)
- Recreational activities
  - Passion about working in eco-friendly activities and interacting with the sea and its creatures (Owner of business providing water sports activities)

##### Educational degree

only 20% of the KAP tourism operators' participants have earned an educational degree and/or certificate related to the tourism service/activity they work in such as: mixology degree and food technician degree; Kayaking instructor certificate and Guide certificate (certificate provided by TCNR); and tourism course on an online e-learning platform.

##### Membership in social networks and groups

None of the 20 participants are part of any social network or group working within the framework of the tourism sector.

##### Tourism sector performance

the interviewed tourism business owners were not able to provide accurate figures about the yearly number of visitors/users of their services, as well as their yearly income generated from tourism services and activities. This might be explained by the non-formal aspect of most of these services. For instance, guesthouses, tents on TCNR beach, and restaurants do not have an access control system to reflect the exact number of users. Moreover, many hotels do not provide their occupancy rate in a consistent manner to the Ministry of Tourism as they are supposed to do on a yearly basis.

But one tent owner on the TCNR touristic sandy beach provided a detailed breakdown of the operational costs for a tent during a 4-months season:

- Installation and preparation costs: 7,000,000 to 10,000,000 LBP
- Dismantling: 4,000,000 to 5,000,000 LBP
- Workers: 2,000,000 LBP per worker and per season (number of workers ranges between 2 and 8)
- Space rental fee (paid to the municipality): 2,400,000 to 6,000,000 LBP per month depending on the tent surface
- Electricity: 875,000 LBP per month
- Wastewater treatment and cleaning fee: 500,000 LBP per season
- Tent and equipment storage during off-season: 3,000,000 LBP (yearly contract)

Based on the provided data, the operational costs of an average tent on the TCNR touristic sandy beach is estimated at 34,200,000 LBP per season.

##### Challenges facing the tourism sector

One of the interviewed tourism operators said that in the tourism zone of the reserve, the cleaning and the sorting of waste was carried out for 2 years. However, this year, the reserve did not provide them with the necessary waste bins to sort out the waste and therefore it was not done. He suggested that to facilitate the implementation of environmentally friendly laws and regulations, the reserve should provide the necessary

support by ensuring that the required material such as garbage bins were made available to the workers. There are other more general challenges such as the unstable political situation in Lebanon, Covid-19 pandemic and the economic crisis.

### 7.2.5. Involvement in the agriculture sector

The KAP survey interviewed 20 farmers distributed as follows: 9 Lebanese, 9 Palestinians, and 2 Syrians. The study team reached out first to Lebanese and Palestinian farmers not knowing the involvement of Syrian farmers as well in this sector. From field visits and from the discussions with the farmers, a decision was made to reach out to Syrian farmers and see if there are diverging or converging ideas between the different nationalities working in the agriculture sector. On average the farmers started working in this sector at the age of 21. 50% of the farmers interviewed on average have 2 household members involved in the sector.

#### Land tenure, size and water source

The Lebanese and Syrian farmers' lands are mainly located in the Ras El Ain area. Palestinian farmers' lands are located on the edge of the Rachidiyeh camp next to the Ras El Ain area. None of the interviewed farmers own the land they cultivate. Palestinian farmers do not pay rent for their lands in the Rachidiyeh camp. They explained that these lands are public property that has been used by Palestinians throughout the years without any governmental control.

As for Lebanese and Syrian farmers, even though Ras El Ain is a public land and part of the TCNR protected area,

there are "powerful" people in the region who took over the land and are sub-renting it in a non-formal and illegal manner to smaller farmers. The rent fees vary between 300,000 and 700,000 LBP per dunum per year. There are 2 farmers cultivating large land plots of 75 and 90 dunums<sup>11</sup>, while the other 18 interviewed farmers have small land plots with an average surface of 6 dunums per farmer. The Ras El Ain water springs constitute the main source for irrigation water, in addition to a few private wells.

#### Main crops

The majority of farmers (90%) cultivate vegetables and leafy greens, they include eggplant (planted by 60% of the farmers), tomatoes (55%), cabbage (50%), cauliflower (50%), Rocca (40%), cucumber (35%), lettuce (35%), green beans (20%), pepper (20%), watermelon and melon (5%), beans (5%), corn (5%), zucchini (5%), broccoli (5%) and other vegetables (5%). Only two farmers have few exotic fruit trees (such as Avocado and Annona) and some citrus trees. The farmers said that they are not allowed to plant trees in the Ras El Ain and Rachidiyeh area. The exotic fruit trees and citrus trees mentioned above are planted near Ras El Ain outside the reserve section.

#### Seasonal costs

Most farmers benefit from two farming seasons (summer and winter), few are able to benefit from 3 seasons (including the spring season). Others with greenhouse production enjoy 1 long season. The average seasonal costs of all the farmers interviewed are showcased in the table below. (**Table.15**)

Table 15. Farming seasonal costs in Ras El Ain and Rachidiyeh areas

Agricultural operations and practices	Average cost in LBP
Rent ranging between 300,000 LBP and 700,00 LBP per dunum	LBP 500,000 per dunum
Seeds and Seedlings	LBP 1,510,000 per dunum
Fertilizers and Pesticides	LBP 1,100,000 per dunum
Rental of equipment (tractors and sprayers) and tools maintenance	LBP 325,000 per season
Purchase of new equipment and tools	LBP 232,000 per season
Irrigation (pipes and pumps) <sup>12</sup>	LBP 105,000 per dunum
Energy/fuel for tractors and water pumps	LBP 147,000 per dunum
Labour (Syrian workers paid 20,000LBP per day for men and 15,000 LBP for women)	LBP 281,000 per dunum
Transportation (to Tyre and Sidon wholesale markets)	LBP 1,350,000 per season
<b>Total</b>	<b>LBP 3,633,000 per dunum + 1,907,000 per season</b>

<sup>11</sup> Dunum is the unit used to indicate agricultural land size in Lebanon, 1 dunum is equivalent to 1,000 m<sup>2</sup>.

<sup>12</sup> The farmers also have to pay 75,000 LBP per dunum per year to the Litani Water Authority, a public organization managing the Ras El Ain water spring in addition to the Litani River in Lebanon and all its facilities including the Qaraoun Dam and the irrigation canals among others.



It is worth mentioning that the above prices in LBP are for the previous seasons when the LBP/\$ exchange rate was 1,500 for 1 \$. Today all agricultural inputs (seedlings, fertilizers, pesticides, irrigation pipes and pumps) are priced in dollars and farmers are requested to pay them at the black market price (estimated between 7,500 and 8,500 LBP for 1 \$ during the study period).

Thus, prices increased 5 to 6-fold compared with previous years. Some farmers stated that they are not able to afford fertilizers and pesticides at the present time so they are opting for natural manure instead which is getting harder to find on the market due to the increasing demand. This could be an opportunity for TCNR to start promoting organic farming in the region.

Due to the severe economic crisis and high production costs some farmers were unable to cultivate the whole land plots they rented this season. They explained that the costs of cultivation are ever changing with the LBP/\$ exchange rate fluctuation, while prices on the market have not increased as much to cover their production costs and to make a profit. However, some farmers noted that there is increasing demand these days for vegetables in general. Hence, they explained that there is no problem in selling all their produce in the wholesale market or directly to end-consumers who have produced their own preserved food for the winter season.

### 7.2.6. Knowledge

The first question about the knowledge of the respondents about the existence of TCNR revealed that 95% of the total number of KAP survey participants (77 people) have heard of TCNR. Annex.5 details the different questions related to the level of knowledge of the different KAP groups about TCNR, its characteristics, mission, objectives and management. Among the 95% of the respondents who claimed that they have heard about TCNR:

- 52% claimed that they know when TCNR was created, however only 3% of them gave the correct answer, they were all part of the household members' respondents. The majority of those who gave a wrong answer think that the reserve was created between 2000 and 2010. 43% of the total respondents claimed that they had the chance to read the TNCR law, almost equally distributed between the four categories of respondents; however, none of them was able to remember any of the major articles of the law.
- When asked about their knowledge about the main conservation and development objectives of TCNR, 58% answered yes. They were all able to give between 1 or 2 correct objectives, thus their answers were considered partially correct. The

main objectives they mentioned were: protecting the ecosystems of the area, protecting the Ras El Ain water spring, protecting marine and terrestrial wildlife and biodiversity, protecting the sand dunes, prompting sustainable tourism, increasing people's awareness of environmental issues.

- Regarding the surface area of TCNR, 73% claimed that they know it; however, only 1 household member was able to give a correct answer with the exact coastal and marine area. All fishermen think that the coastal section of the reserve is between the Sandy beach and the Rachidiyeh camp; they do not know that it also covers the Ras El Ain area; as for the marine area, they do not know the exact delimitation and its surface. Tourism operators are divided between those who think that the reserve covers the sandy beach area and is bordered by the Rachidiyeh camp, and those who think that the reserve starts at the last tent installed on the sandy beach until the border with the Rachidiyeh camp; they also do not know that it also covers the Ras El Ain area. Most of the farmers think that the reserve is limited to the Ras El Ain area, and some of them add to it the sandy beach, none of them know the conservation area.
- As for the different sections of the reserve and the difference between them, only 32% claimed that they know the sections; however, only two tourism operators and two household members were able to name the three sections and explain the difference between them.
- 53% of KAP respondents said that they know emblematic and endemic species of the reserve. Among these 53%, all fishermen and tourism operators gave partially correct answers and named at least one species, whereas 73% of household members gave partially correct answers, and only 38% of farmers gave partially correct answers. The sea turtle is by far the most known species.
- 58% claimed that they know who manages TNCR, however, none of them gave a correct answer. The majority of fishermen think that it is managed by the municipality, whereas the other groups of respondents named different persons without being able to explain the management framework.
- 46% said that they know the ecological sensitive areas of the reserve. All groups gave partially correct answers and mentioned at least one of the following areas: turtles nesting sites, sand dunes, Ras El Ain ponds and water springs, conservation area between the sandy beach and the Rachidiyeh camp and different parts of the sea where fishes reproduce.
- 39% are aware that TCNR is acknowledged internationally as well as its designations because of its ecological importance, but no one was able to mention any of them.

### 7.2.7. Attitude

To understand their attitude towards TCNR and its role, the KAP participants were asked to score the below statement from 1 to 5 (1= Not important; 2=little important; 3= Neutral; 4=Important; 5=Extremely Important). On average, the 77 respondents saw TCNR's role in the conservation of natural resources and biodiversity in Tyre and in the conservation of the visual landscape in Tyre as important. As for its role in environmental conservation in Lebanon and in the South of Lebanon,

although neutral, it is skewed towards important with 3,7. TCNR's role, however, in the economic development of Tyre and in the socio-economic development of southern Lebanon and Lebanon is perceived to be neutral. In general, fishermen tend to have a neutral attitude towards the role of TCNR at all levels. Tourism operators, farmers and household members find that the reserve plays an important to extremely important role in biodiversity and landscape conservation in Tyre, and an important role in environmental conservation in south Lebanon and Lebanon in general. (Table.16)

Table 16. Attitude towards TCNR

TCNR role in the	Fishermen	Tourism operators	Farmers	Household members	All
Conservation of natural resources and biodiversity in Tyre	3.4	4.5	4.4	4.6	4.1
Conservation of the visual landscape in Tyre	3.3	4.6	4.4	4.7	4.1
Economic development of Tyre	3.0	3.9	4.0	3.6	3.5
Socio-economic development of south Lebanon	2.9	3.6	4.0	3.3	3.2
Socio-economic development of Lebanon	2.8	3.2	3.8	3.3	3.1
Environmental conservation in south Lebanon	3	4.1	4.2	4.35	3.7
Environmental conservation in Lebanon	2.9	4	4.1	4.35	3.7

There were 45 survey respondents among the 77 who have heard about TCNR, who believe that the reserve is under threat. The tables below show the complete list of

the threats and challenges, and the potential measures suggested with the number of people suggesting each measure. (Table.17, Table.18)

Table 17. TCNR threats and challenges mentioned by the KAP survey participants

TCNR threats and challenges	Fishermen	Tourism operators	Farmers	Household members	Total
Littering especially on the sandy beach section	2	5	4	7	18
Political influence and favouritism	5	3	0	3	11
Illegal Fishing	4	2	1	3	10
Lack of proper management	1	0	5	4	10
Mass tourism taking over the reserve	0	3	0	4	7
Over fishing	3	0	0	3	6
Construction and urbanization	0	0	3	3	6
Lack of regulations and laws enforcement	0	1	2	1	4
Killing turtles	0	2	0	1	3
Solid waste dumping and burning	0	1	1	1	3
High levels of light pollution	0	2	0	1	3
Unawareness of people about the reserve	0	1	0	2	3
Wastewater directed to the beach	0	0	0	3	3
Lack of government presence and support	0	0	2	0	2
Invasive fish species	1	0	0	1	2
Illegal bird hunting	0	0	1	0	1
Tension with the fishermen's community	1	0	0	0	1

Table 18. List of measures suggested by the KAP survey participants to improve the situation of TCNR and its role

Measures	Fishermen	Tourism operators	Farmers	Household members	Total
<b>Establish a management entity that has the right to fine the wrongdoers and to take care of the reserve areas and maintain them</b>	3	8	9	10	30
<b>Awareness Campaigns on the reserve and its importance and environmental benefits</b>	1	4	3	7	15
<b>Governmental support to TCNR and local economic sectors in Tyre, namely tourism and fisheries</b>	3	4	1	3	11
Build a relationship of trust between the reserve and the main users of its resources: farmers and fishermen	1	0	2	1	4
Install garbage bins and manage solid waste in the reserve	0	0	2	2	4
Increase promotion and publicity	0	1	0	2	3
The reserve should protect the fish stocks and not only focus on the turtles	2	1	0	0	3
Designate clear borders for the reserve	0	1	1	0	2
Establish new measures to take care of the invasive fish	0	0	0	1	1
Provide technical support for the reserve team	0	0	0	1	1
Provide support for the farmers	0	0	1	0	1
Promote local produce of the region	0	0	1	0	1
Involve the community in events and activities- have them take ownership of the reserve and protect it	0	1	0	0	1
Better cooperation should be established between the reserve and the Rachidiyeh camp	0	1	0	0	1
Increase the reserve staff members	0	0	0	1	1

Seventeen threats and challenges were mentioned, the most important are: Littering in the reserve and especially on the sandy beach section; political influence and favouritism; illegal fishing; and lack of proper management.

Fifteen measures were stated, the most important are: Establishing a management entity that has the right to fine the wrongdoers and to take care of the reserve areas and maintain them; awareness campaigns on the reserve and its importance and environmental benefits; and governmental support for the reserve and the different economic sectors in Tyre, namely fisheries and tourism.

### 7.2.8. Practices

Other than their main activities, 47% of the KAP survey respondents do use the resources and/or practices and activities within the TCNR area (**Table.19**). The main activities are walking, running and swimming. It is interesting to note that many of the survey participants, although located adjacent to the reserve area, state that they are not practicing any activity within TCNR areas.

When asked about the measures they would personally take to reduce the impact of their activities on the reserve, the respondents mentioned mainly the reduction of littering and cleaning the different areas of the reserve (**Table.20**).

Table 19. Practices within the reserve area.

Activity/Resource use	Fishermen	Tourism operators	Farmers	Household members	Total
Running/Walking	2	2	5	8	17
Swimming	1	2	1	3	7
Fishing	3	0	0	0	3
Work in the 49 tents in the touristic zone	0	2	0	0	2
Skating	0	0	0	2	2
Participating in releasing turtles events	0	0	0	2	2
Diving	0	0	0	1	1
Kayaking	0	1	0	0	1
Sightseeing	0	1	0	0	1
Participating in cleaning campaigns	0	0	0	1	1

Table 20. Measures taken to preserve and protect the environment mentioned by survey participants

Measures	Fishermen	Tourism operators	Farmers	Household members	Total
No littering	3	3	5	9	20
Cleaning	1	5	1	2	9
Do not touch anything (Turtles and fish while at sea; avoid touching turtle nests )	1	1	0	3	5
Farmers in the agriculture zone reduced their chemical use (fertilizers and pesticides). Instead they are using manure and organic pesticide (or less harmful pesticides).	0	0	4	0	4
Staying on the path	0	0	0	2	2
One participant said that he does not allow anyone to hunt birds in the reserve area	0	0	1	0	1
One fisherman explained that he goes far away from the seashore - not affecting fish of the reserve.	1	0	0	0	1
Not fishing small fish	1	0	0	0	1
Spreading awareness about the reserve and importance of protecting it	0	1	0	0	1
Nets diameters are big	1	0	0	0	1





## 8. RESULTS ANALYSIS AND DISCUSSION

### 8.1 Fisheries stakeholders' mapping

The fisheries stakeholders mapping and the value chain structure represented by the Venn diagram (**Figure 7**).

7) will be presented below by examining the role and relationship of the different stakeholders involved in the fisheries sector.

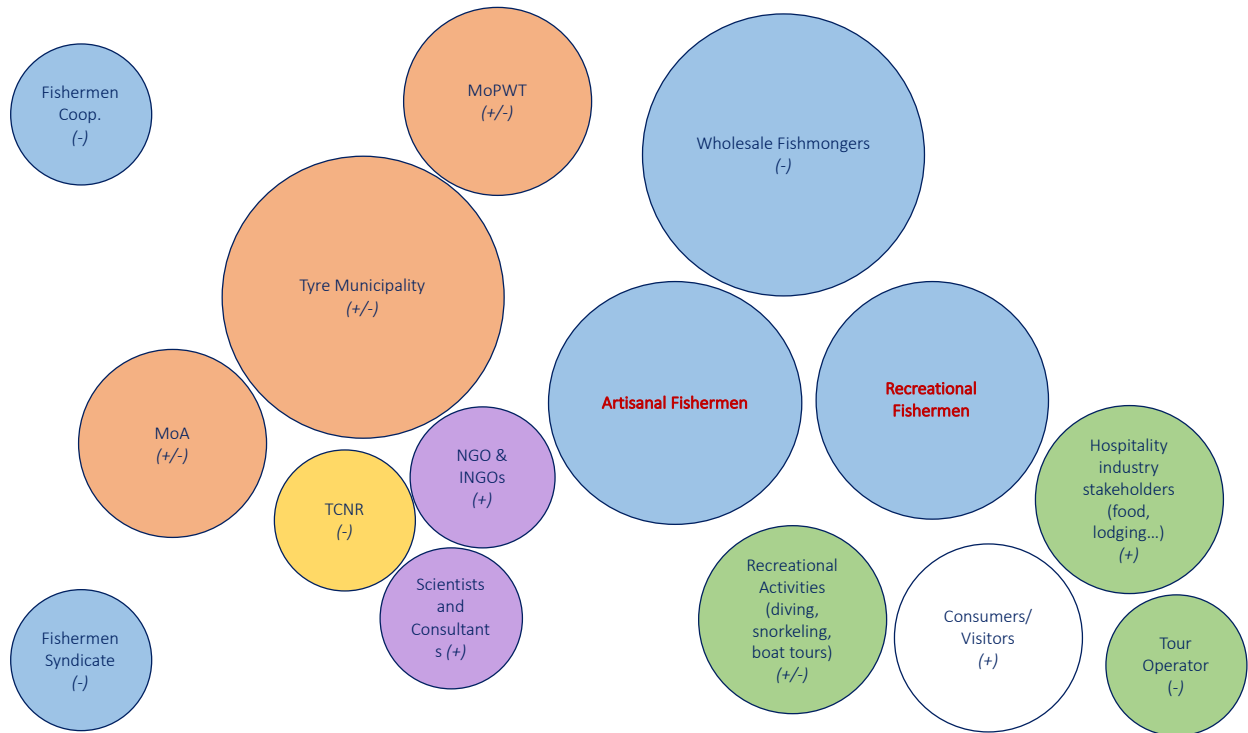


Figure 7. Fisheries sector stakeholder mapping and value chain structure represented by a Venn diagram

#### Venn diagram notes and considerations

**Each circle** represents a stakeholder related to the sector represented - in this section it is the fisheries sector taking the fishermen perspective (name in red).

**Circle size:** smallest circles are the ones representing stakeholders that have little importance and influence on the sector; medium size circles represent the stakeholders that have medium importance and influence on the sector; and the largest circles are for the stakeholders that have the most importance and influence on the sector.

**(+) and (-) signs:** these signs showcase if the stakeholder has a positive (+) or negative (-) influence on the sector. Some as seen have both signs which either represent the stakeholder's neutral influence on the sector or represents its volatile positive and negative importance in the sector – these cases will be described in detail in the paragraph below describing the role of each stakeholder in the sector.

**Colours:** green- tourism sector related stakeholders; orange- governmental institutions; blue- fisheries sector related stakeholders; purple- for national and international non-governmental organizations and experts.

**Circle distance:** the farther the distance between circles shows the lack/missing relationship between stakeholders; and the closer the circles the tighter the relationship.

**Fishermen** represent the poorest community in Tyre. 80% of the fishermen rely on the fisheries sector alone, with an average monthly household income of around 950,000LBP from the sector. There are two types of fishermen: **the artisanal/traditional** (where fishing is the main income source) and **recreational/amateur** (where fishing is a hobby). Both types are benefiting from the sector, however, there is "rivalry" between both types. According to the artisanal fishermen, recreational fishermen are practicing overfishing and illegal fishing, and hence are depleting the fish stocks. Moreover, there is no control over the recreational fishermen, which frustrates the artisanal fishermen who have to get a fishing licence, pay registration fees, and follow the regulations. However, having said that, the recreational fishermen, just like the artisanal fishermen, both sell their catch on the market. Most fishermen rely on the wholesale fishmongers to sell their catch, as it ensures a daily income. The **wholesale fishmongers** benefit from a 100% markup on all the fish caught and sold to them. With that fishermen have become dependent on them to sell their produce, since they are not in direct contact with the consumers anymore. Moreover, they rely on the fishmongers for loans to cover their high running costs. There are only few fishermen who sell directly to **customers** and to the **hospitality industry stakeholders**. Additionally, some fishermen are more involved in the tourism sector by providing recreational activities to visitors coming to Tyre, and some are even in direct contact with one of the hospitality stakeholders (accommodation) to offer with their boat tour services exclusively to their guests. As noted by artisanal fishermen, recreational fishermen are getting a higher income at the end of the month due to the tourism sector, however more and more fishermen are seeing an opportunity in providing boat tour rides and other water-related sports and activities. **The tour operators'** relationship with fishermen and the port of Tyre is very weak. The fishermen have already established a relationship with the different visitors that are coming to Tyre (as individuals). What makes the relationship complicated is when TCNR is involved, since the administrative policies and regulations frighten the fishermen and make them reluctant to collaborate with TCNR and the tour operators.

There is neither a functioning **fishermen's syndicate** nor a functioning **fishermen's cooperative**, which leaves the fishermen alone fighting for their rights. Fishermen, in general, do not benefit from any social security and health care services, leaving them and their families very vulnerable. Hence, the reason why many fishermen rely on the wholesale fishmongers and political parties for loans and financial support.

Each year, the fishermen have to renew their boat licences at the **Ministry of Public Works and Transport (MoPWT)** and have to register, get a fishing permit, and

provide a list of fishing equipment and vessels used to the **Ministry of Agriculture (MoA)**. The licence provided to the fishermen does not differentiate between the artisanal and the recreational fishermen, which leads to an increasing number of people fishing and selling fish on the market. The MoA's Department of Fisheries and Wildlife in Tyre takes care of the licence, as well as of monitoring the fishing practices and fining fishermen practicing illegal fishing, and takes care of providing technical assistance and coming up with new projects to improve the fishermen's knowhow. The relationship between the Ministry of Agriculture and the fishermen is a top down approach, since the regulations set are not necessarily very feasible for the fishermen, and are ever changing without supporting the fishermen with implementing the change in buying nets for example, and/or to ensure them a source of income when they have to stop fishing during the off-fishing seasons.

**The Tyre municipality** gives the fishermen a helping hand by facilitating their registration and obtaining their fishing licence. A benefactor is currently paying for all the registration fees at both ministries, namely the MoA and the MoPWT.

There is no relationship between the **Tyre Coast Nature Reserve (TCNR)** and the fishermen, there is no social connection and community level between them. For fishermen, the reserve's extra efforts in protecting the turtles is putting their fishing practices at risk. In fact, most fishermen do not like turtles as they break their nets if they get caught in them. The fishermen could be fined and risk losing their fishing licence if a turtle is seen to have got caught in their nets. In addition, many projects that come through TCNR only focus on the protection of turtles and the fishermen are not included in these projects. The fishermen explained that if they and their families received some sort of support, they would not have to go out of their way to catch fish, some go fishing at night to avoid being caught by the Zodiac patrol boat sent by the TCNR and the MoA and the Tyre municipality staff gets involved as well. If caught and fined, the Tyre municipality informs the MoA of the infractions. The MoA sends its Forestry rangers who then take the fishermen to court. However, the MoA is not informed of the court's final decision so that there is a lack of information as to what happens next in such a case.

Many **local and international NGOs, scientists and consultants** support the fisheries sector (by providing micro-credits, installing a wholesale market, conducting socio-economic studies...) particularly through either the Tyre municipality and/or the MoA. As already noted, the scientists and consultants are the only ones in direct contact with the fishermen, filling in surveys, conducting field reviews... and when talking about the reserve personnel, few of the fishermen knew the reserve and its management.



## 8.2. Tourism stakeholders' mapping

The tourism stakeholders' mapping represented by the Venn diagram (Figure.8) will be presented below

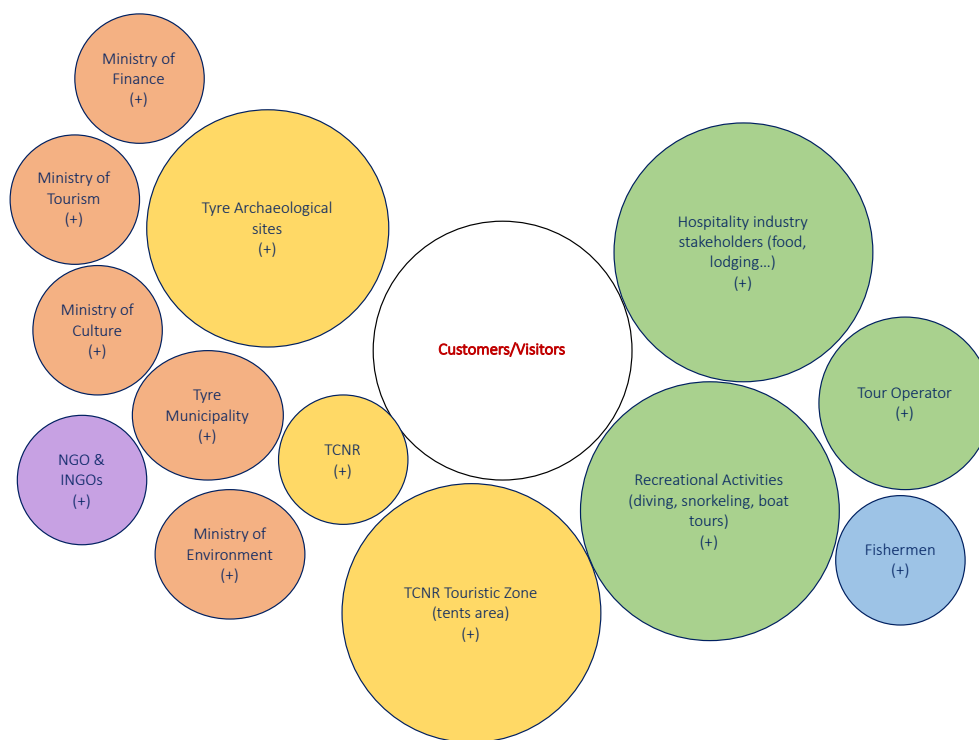


Figure 8. Tourism sector stakeholder mapping and value chain structure represented by a Venn diagram.

The **customer/visitor** is deemed to be the main stakeholder in the tourism value chain since he/she is its main driver. The main two attractions Tyre visitors enjoy are the **Tyre archaeological sites** and the TCNR touristic zone (tents area). The archeological sites are owned by the Directorate General of Antiquities, which is under the **Ministry of Culture**, and the sites are managed by the **Ministry of Tourism** and **Tyre Municipality**. The Ministry of Tourism monitors the number of tourists coming in and out of the archaeological sites. The income from the archaeological sites goes to the Tyre municipality and the **Ministry of Finance**. From the **hospitality industry stakeholders**: the Tyre Rest House is owned by the Ministry of Tourism and the implementers on the ground invest and pay the Ministry on a yearly basis. There are 4 registered guesthouses (upscale) in Tyre located in the Christian street. All these guesthouses are upscale which makes the stay in Tyre expensive. The Ministry of Tourism monitors the occupancy rate of these guesthouses. During the high season, most of the guesthouses are fully booked. The unregistered accommodation facilities are lower budget guesthouses and Airbnbs. Personal efforts were made by different accommodation facilities (such as Airbnbs) to join forces and promote each other. Still these efforts are preliminary and as yet there is no entity to

by examining the role and relationship of the different stakeholders involved in the tourism sector.

oversee all the stakeholders in the hospitality industry. Each actor is playing and promoting his own business. Even though each stakeholder has a different style/clientele, there is nevertheless competition between the stakeholders. Not all restaurants are registered at the Ministry of Tourism, so not all have their data and information recorded at the Ministry.

More and more **recreational activities** are provided by **fishermen** and other **tour operators** such as boat tours, diving, snorkeling, kayaking... That being said, with no entity taking care of the sector, tour operators are finding it hard to organize trips for customers and diversify their offerings in Tyre. Currently tour operators are able to attract visitors to Tyre with the limited activities they already have with some local stakeholders.

The Tyre municipality invests in the **TCNR touristic zone** of the reserve. The municipality signs a contract each year with the TCNR Committee after obtaining the approval from the **Ministry of Environment** in order to exploit the touristic zone through the installation of 49 tents used as rest areas and restaurants. This yearly investment by the municipality creates employment - to manage the touristic zone (life guards, cleaners...) - for 70 people. The 49 tents work for 4 months during

the summer season. The touristic zone is the main attraction for visitors in Tyre. It is the longest public sandy beach in Lebanon.

Although attracting many tourists to its touristic zone, **TCNR** as a whole is not well known to visitors. Even though the TCNR centre is at the beginning of the tents area, there is a lack of communication and of signposting to direct the people to the reserve and to explain what is to be seen and discovered in the reserve and what rules are to be observed in the reserve. Additionally, the people directly benefiting from the touristic zone, from the tent area for example, are saying that this area of the reserve is not well managed. Lack of management is all too common in the touristic area just as in other zones as well (conservation and agriculture). In fact, TCNR has no influence over the visitors' behaviour in its touristic zone and its environment. **Local and international NGOs** have worked on the tourism sector by improving bed and breakfast, launching trails for hiking and cycling and establishing a visitor's centre at TCNR. However, as there is no entity to oversee all the

stakeholders in the sector, most of the tourism-related projects are not sustainable. It is by word of mouth and personal marketing efforts which are attracting people to visit the different parts of Tyre.

All stakeholders have a positive impact on tourism, as they are not harming it per se but they are not making huge progress either as they are not being overseen by a single entity. Each stakeholder at this point is promoting his/her own business. Many challenges affect the sector and most of all in Tyre the security and political instability are the main challenges for the tourism sector in particular.

### 8.3. Tyre Coast Nature Reserve stakeholders map

The TCNR stakeholders mapping represented by the Venn diagram (**Figure.9**) will be presented below by examining the role and relationship of the different stakeholders involved in TCNR management.

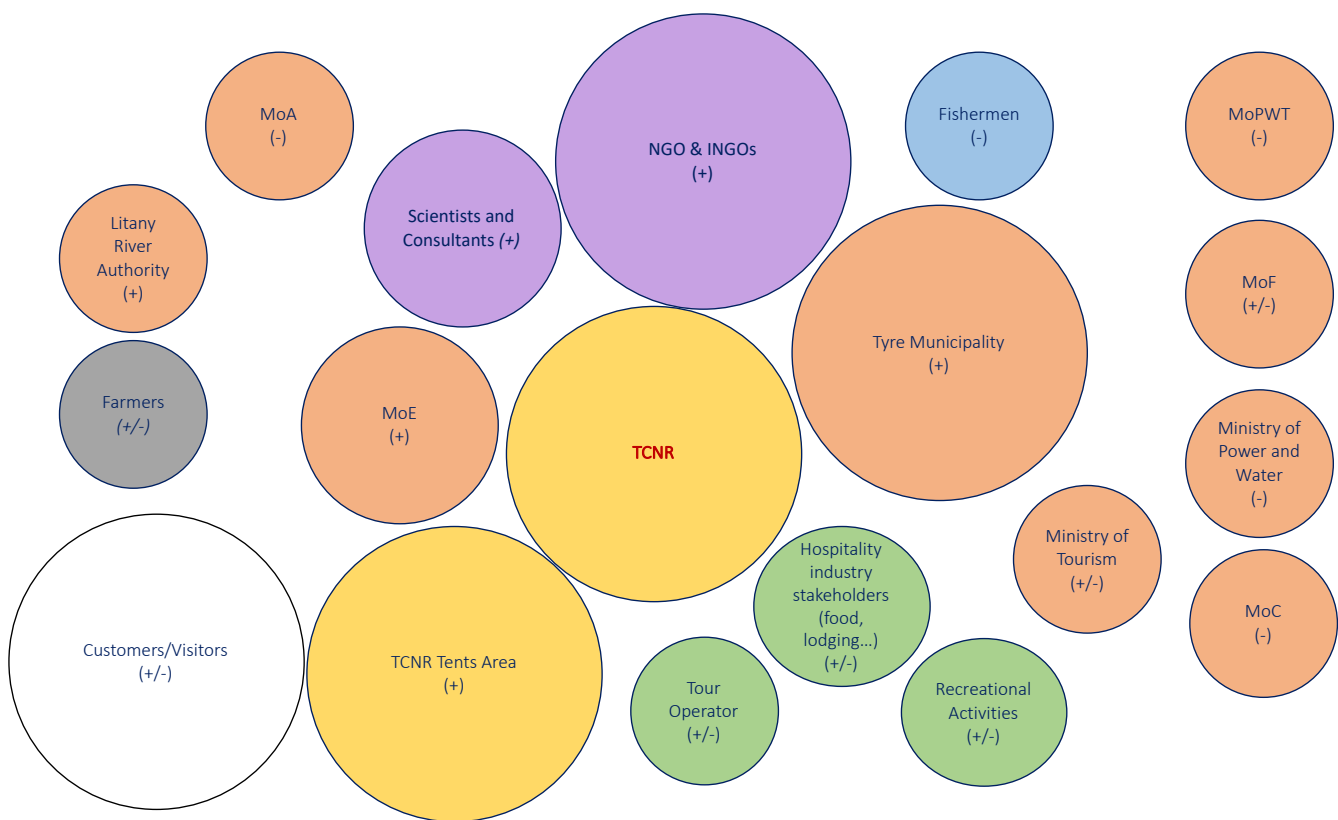


Figure 9. Tyre Coast Nature Reserve (TCNR) sector stakeholder mapping and value chain structure represented by a Venn diagram.

The TCNR land is under the legal ownership of the **Ministry of Finance (MoF)**. The **Ministry of Environment (MoE)** is responsible for the establishment of the TCNR Committee and the overall supervision of the management of the reserve in order to safeguard the reserve and its biodiversity. It makes financial contributions to the reserve on a yearly basis. This contribution is divided into: human resources (salaries), infrastructure (renovation and rehabilitation), awareness (booklets, brochures, workshops...), and administrative costs (telephone, internet, electricity, others). However, due to bureaucracy issues (delays by the TCNR committee in sending their financial reports to MoE, delays at MoF in disbursing the funds after the MoE had made a decision...) so that the yearly contribution gets delayed. According to the interviewee, TCNR is able to cover 6 months of the management team salaries through the MoE contribution and the second 6 months through the revenues from the touristic zone through the Tyre municipality (from their investments and profits during the summer season). The **Ministry of Public Works and Transport (MoPWT)** oversees all the beaches in Lebanon, and has parallel jurisdiction with the Ministry of Environment (MoE). The **Ministry of Agriculture (MoA)** is liable for the management of the agricultural land, however currently the MoA is not playing an active role in TCNR; the **Ministry of Culture (MoC)**, through the Directorate General of Antiquities, oversees all archeological and historical sites, including that of Ras Al Ain, but is not present on the ground (from field observation).

The **Tyre municipality** is running the touristic zone of the reserve and managing it and the reserve's parking lot during the 4-month summer season. Additionally, the Tyre mayor is the president of the reserve committee, which led to a constant support system being established between TCNR and the Tyre municipality.

The **Ministry of Power and Water (MoPW)** is mandated to supervise and manage the use of the groundwater resources in TCNR. The Ras El Ain **farmers** use extensive fertilizers and pesticides which endanger the groundwater resources in TCNR.

The **Litani Water Authority** is authorized to manage the water in Ras el Ain for irrigation. The Litany Water Authority is in direct contact with the farmers, as they pay a yearly fee to receive the water. The farmer/reserve relationship is a neutral one. The problem is that the agricultural area of the reserve is being taken over by people - big farmers-who are sub- renting "their land" (reserve property) to smaller farmers. This means that there can be no control over the farming activities in that area unless the TCNR rights, rules and regulations are implemented first and foremost.

Additionally, there are many **local and international NGOs** including **scientists and consultants** who are working in close collaboration with TCNR to improve its environment, biodiversity, and to preserve its richness. Some of the projects initiated by TCNR link the **fishermen** to the reserve while distributing eco-friendly assets: such as the green light bulb which can repel the turtles away from the nets. However, despite the positive impact of this initiative, some fishermen still believe that the reserve should be collaborating with them more closely especially with reference to fishing and environmental issues.

The touristic zone of the reserve is where the tents are installed every year. The tents are a positive addition to the reserve as they attract people to the reserve and thus provides an income which helps the reserve to cover its managerial costs. The tourism sector, including the **tour operators, recreational activities and hospitality industry stakeholders**, are not directly in touch with the reserve –and even though they might visit the reserve's touristic zone, they do not discuss or help to manage the reserve. The relationship between the operators and TCNR is notably weak and perhaps the tour operators could do something about this. One interviewee explained that he personally directly gets in touch with the reserve if he wants to organize a tour because for him this is important as the reserve is in Tyre and the reserve is a world heritage UNESCO site.

#### 8.4. DPSIR model for local resources management and use

The Driving Forces-Pressures-State-Impacts-Responses (DPSIR) framework reflects the existing complex environmental issues. It is a systems-thinking framework that adopts cause-effect relationships amongst environmental, social and economic systems. It also integrates the socio-economic and cultural aspects of both human and environmental health and wellbeing. Therefore, DP-SIR will be able to link ecological and socio-economic factors. The DPISR adaptation below has been described by the United States Environmental Protection Agency (EPA), as an Eco-Health DPSIR as it reflects in parallel both the ecosystem health and human health (EPA, 2015). This version captures fundamental concepts such as sustainability including equity, human well-being, natural capital, socio-economic, physical and behavioural parameters, related to human health and well-being, and the environmental factors affecting it. Hence, it integrates the socio-economic and cultural aspect of the ecosystem and human health. (**Figure.10**)

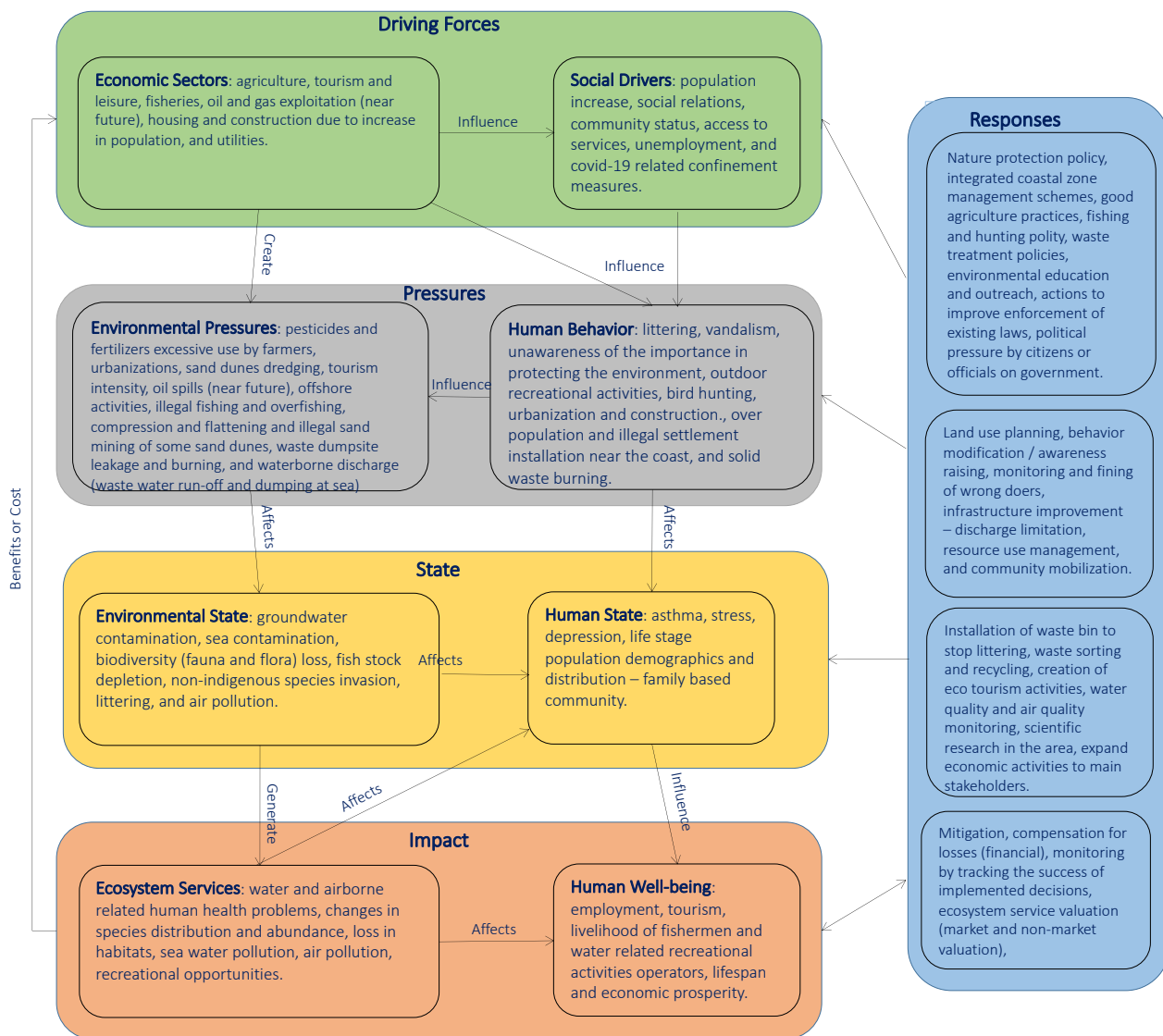


Figure 10. Eco-Health DPSIR framework for Tyre.

Figure 14 shows the DPSIR framework for Tyre. **Driving Forces** are the features that encourage human activities and fulfill basic human needs, which have been constantly recognized as the essential prerequisites and materials for a good life, good health, good social relations, security, and freedom. **Pressures** are defined as human activities, resulting from the working of socio-economic driving forces that make changes in the environment, or human behaviours that can influence human wellbeing. **State** defines the natural and built environment and human systems. The above changes have an **Impact** on the welfare of humans including the production of ecosystem goods and services and ultimately, human well-being. **Responses** are actions taken by groups or individuals in the society and government to avert, compensate, improve or adjust to changes in the state of the environment; and to change human behaviours that affect human well-being, or to compensate for social or economic impacts of the human condition on human well-being.

## 8.5. Inter-sectorial analysis and stakeholders' matrix

As seen above, the tourism sector can support the fisheries sector, despite the fact that both tourism and fisheries value chains are not well structured and organized in Tyre and the TCNR, as there is no communication and support between each of the sectors and within each sector. During the summer season, the focus can be on tourism for fishermen, while during the other seasons they can focus on fishing. However, with laws limiting the fishermen from taking tourists on their fishing boats, the MoA is currently looking into activities and projects in which the fishermen could participate outside their fishing schedules.

The TCNR can play a role in bringing the fisheries and the tourism sectors closer together according to one interviewee, as in the case of the Shouf and Ehden Nature Reserves with reference to the tourism and rural

development sectors. Currently, TCNR is not linking the fisheries and tourism sectors. The TCNR works with the fishermen mainly in association with the MoA on sustainable fishing. So far there have been no major inputs in order to initiate tourism activities with the fishermen, as package deals are not being introduced or promoted for the fishermen in the form of coastal tours and traditional promotional tours.

Through and/or by involving the reserve, a network could be established between all sectors. The reserve could be a place to promote and sell ecotourism, agro-tourism and eco-tourism packages, there could be a shop to sell souvenirs made by women's coops and by fishermen... It could be a place where technical assistance could be provided to guide the fishermen and other tourism stakeholders in hospitality, hygiene, food safety, communication and other activities. The figure below showcases the interest level and influence/power that each of the stakeholders in the tourism and fisheries sector has when it's a question of working on inter-sectorial support. (Figure.11) Starting with the stakeholders with a high degree of influence/power and particular interests: TCNR is already in talks in order to combine the two sectors of tourism and fisheries. They wanted to support fishermen by diversifying their sources of income. An example is to make fishermen part of their eco-tourism packages where people can go on a boat tour ride with the fisherman and then eat at his home. The Tyre municipality is very influential in Tyre and has an interest in supporting its poorest community (Fishermen). Customers/visitors can lobby for such activities and they have a huge impact on this

inter-sectorial dynamic survival or its failure. As for NGOs and INGOs, many projects suggested already mention the need to work on the tourism and fisheries sector and implement activities and interventions including both stakeholders.

Stakeholders with the least influence/power and low interests: farmers are the stakeholders that do not see any interest or benefit in the partnership between the tourism sector and the fisheries sector. However, interest can be increased if the reserve is involved and able to sell its produce under its name to this inter-sectorial mix. The Fishermen's cooperative and syndicate are currently non-functional. So with their low influence/power and their non-present interest, they cannot provide much in this inter-sectorial set-up.

Stakeholders with low interest and high influence/power: The Ministries of Environment, Tourism, Culture, Public Works and Transport, and Finance, and the Litany Water Authority are all very influential in both the fisheries and tourism sectors, and even in the agricultural sector, and the Litany Water Authority has a lot of influence. However, these entities are not interested (no one asked, and the idea was never brought up by any of the participants) in the inter-sectorial dynamics that could be created, as some might prefer not to make an effort and just wait and see how things evolve.

Last but not least, the stakeholders with high interest but low influence/power: the fishermen, tour operators, recreational activities operators, hospitality industry stakeholders. All will benefit directly from inter-sectorial efforts. This would diversify their activities and target

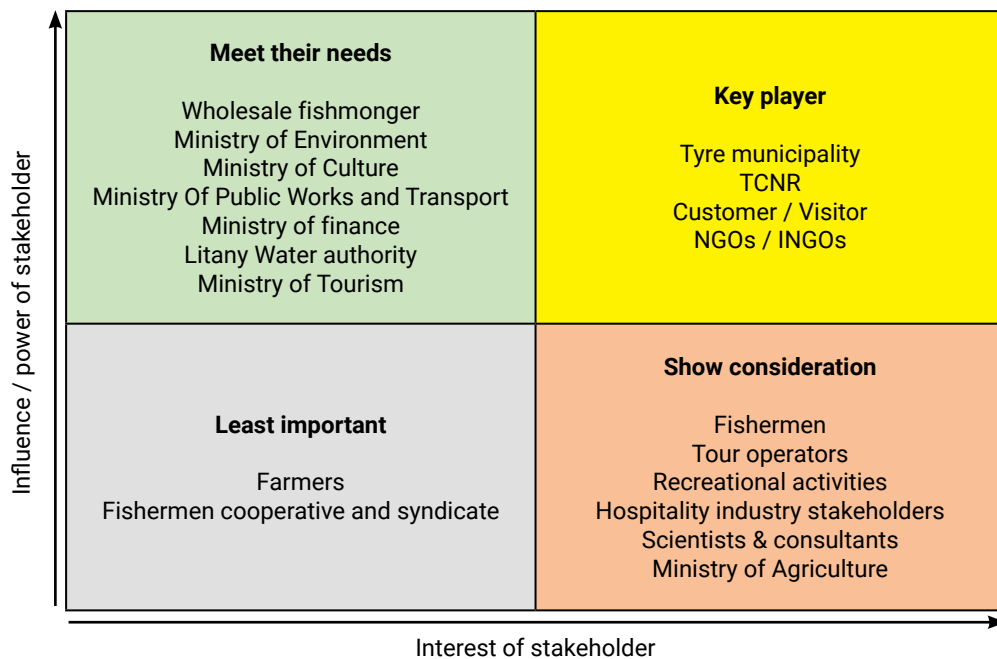


Figure 11. Stakeholder analysis.

markets and with that their income. The Ministry of Agriculture, not having much power on the ground, is looking to diversify and increase the fishermen's income the whole year round and the tourism sector was one of the activities they were thinking about, hence the high interest. As for independent scientists and consultants, they usually work on promoting the socio-economic livelihood of the population and the study they have carried out suggested this inter-sectorial work- hence they will be pleased and will encourage such work- though they don't have much power and influence to implement this change without the local authority's support and donor funding.

## 8.6. Resources use and management Conflict Matrix

Figure.12 presents Resources use and management conflict matrix described in the following section. Artisanal fishing is in strong conflict with recreational fishing, as they believe they are depleting their fish stocks with their illegal fishing practices and overfishing. Moreover, the artisanal fishermen are in strong conflict with the reserve – putting many restrictions on fishermen for the sake of the marine turtles. Small conflicts exist between the artisanal fishermen and recreational activities, especially water-related activities (such as

Activity	Artisanal Fishing	Recreational Fishing	Tourism service providers	Recreational activities	Farming	TCNR	Residential area (incl. informal settlement)	Cultural historical sites and landscapes
Artisanal Fishing	Strong Conflict	Slow conflict	No Conflict	Slow conflict	No Conflict	Strong Conflict	Slow conflict	No Conflict
Recreational Fishing	Slow conflict	Strong Conflict	No Conflict	No Conflict	No Conflict	Slow conflict	No Conflict	No Conflict
Tourism services	No Conflict	No Conflict	Strong Conflict	No Conflict	No Conflict	Strong Conflict	Slow conflict	Slow conflict
Recreational activities	Slow conflict	No Conflict	No Conflict	Strong Conflict	Slow conflict	Slow conflict	No Conflict	Slow conflict
Farming	No Conflict	No Conflict	Slow conflict	Slow conflict	Strong Conflict	Strong Conflict	No Conflict	No Conflict
TCNR	Strong Conflict	Slow conflict	Strong Conflict	Slow conflict	Strong Conflict	Strong Conflict	Slow conflict	No Conflict
Residential area (incl. informal settlement)	Slow conflict	No Conflict	Slow conflict	No Conflict	No Conflict	Slow conflict	Strong Conflict	No Conflict
Cultural historical sites and landscapes	No Conflict	No Conflict	Slow conflict	Slow conflict	No Conflict	No Conflict	No Conflict	Strong Conflict

Strong Conflict
Slow conflict
No Conflict

Figure 12. Resources use and management Conflict Matrix for Tyre.

scuba diving, diving, tourism boats), as they are taking too much space in the fishing port.

As for residents and informal settlements, artisanal fishermen complained that the residents in the informal settlements are practicing illegal fishing using dynamite, without being controlled and they are dumping their solid waste and wastewater at sea.

Recreational fishing is in strong conflict with the artisanal fishermen, especially those who provide boat tours for visitors without having the proper tourism licence and equipment such as life jackets, first aid kit, and fire extinguishers. Furthermore as with the artisanal fishermen, the recreational fishermen are in a slightly less acute conflict with the reserve, as it does allow them to fish close to the sea shore ( and puts the

turtles on top of the fishermen rights and livelihoods – cette partie de la phrase est incompréhensible!)

The tourism sector in general has a low level conflict with the residential area, especially with the residents of the informal settlements who leave their waste behind them when swimming and/or walking on the beach. The recreational activities have a low level conflict with the reserve, and we understood that they are not allowed to practice their activities in the reserve area starting from the touristic zone. Some said that there are only a few – politically backed- people who are allowed to be installed in the touristic zone of the reserve.

Farming is in strong conflict with the reserve as the farmers are worried they will have to stop their activities because the reserve might take over their lands. The

farmers (Lebanese and Syrian farmers especially) are in strong conflict with the Rachidiyeh settlement which has cut the land in half (in the middle so to speak) as the settlement does not seem to abide by any rules. The farmers are in low conflict with the tourism sector and recreational activities, especially the trespassers and occasional visitors who come into the agricultural zone of the reserve and who leave their waste behind.

The Tyre Coastal Nature Reserve is in direct strong conflict with the fishermen (artisanal and recreational) because some are practicing their activity within the reserve marine area, some are practicing illegal and off season fishing, throwing their garbage at sea and are harming the turtles. The reserve is in strong conflict with the tourism sector – as some visitors are trespassers in the conservation and agricultural zones, they make camp fires and leave their trash behind thus harming the turtles and their nesting sites. The reserve is in strong conflict with the farmers as they make excessive use of fertilizers and pesticides, affecting the reserve's groundwater and causing leakages into the sea. It is also in a low level conflict with the informal settlement and residential area as solid waste and wastewater are dumped into the sea and waste matter is burned in the reserve area. And last but not least, the reserve is in low conflict with the recreational activities practiced which are not respectful of the environment.

The residential area (especially the informal settlement) is in a low level conflict with the reserve which is putting restrictions on the settlement.

As for cultural historical sites and landscapes, they are in a low level conflict, mainly with the tourism and recreational activities which are not well controlled as some irresponsible visitors spoil the sites visited as they leave their litter behind and also commit some acts of vandalism.

## 8.7. Gender Analysis Framework (GAF)

### 8.7.1. Livelihood activities, roles and relations

In the fisheries sector, men are more present and involved than women. One fisherman explained that women are not involved in the sector as the sector is still very manual and as yet not mechanized. However, in some areas in the north, women are involved in the weaving of nets and some creative work. In Sour, no women (according to field observations) are involved in the sector. Some fishermen coming from Syria have registered their boats in the name of their Lebanese wives, in order to get the boat licence and fishing permit. Things are different in the agricultural sector. Syrian labour is mostly hired by

Lebanese and Palestinian farmers. For picking and manual labour, Syrian women are employed as they are paid less per day than their male counterparts. As for tourism, there is more of a gender equilibrium. Men and women work side by side in the hospitality industry (restaurants and accommodation).

In view of the above, it is worth mentioning that there is no accurate data or numbers to reflect the percentage of men and women involved in these activities and no one has any knowledge of the numbers involved.

### 8.7.2. Asset Capabilities

Women in the fisheries sector can be involved in repairing the nets and in processing the fish – but that is still not the case. In the agricultural sector, an additional income source for men and women can be in producing local preserved food "Mouneh" and in vegetable processing. With this, farmers would be able to increase the value of their produce and sell at higher prices. As for the tourism sector, work between the different stakeholders can be initiated and involve the women's cooperative, youth and the local community in their daily operations.

### 8.7.3. Power and Decision making

The relationship between men and women in Tyre represents the dynamics prevalent in most of the Lebanese villages. Lebanon is a patriarchal society where the man, the head of the household, is the one making most of the decisions related to the family, and the woman takes care of the household chores and of the children. In our field observations, some men refrained from talking to a woman researcher, and were directing their discussions to her male counterpart. However, in families with a higher educational level, both men and women are equally involved in decision-making concerning the household. From the interviewed participants it became clear that the men had a higher educational level than the women.

### 8.7.4. Needs and Priorities

The women interviewed (n.12) were less educated than the men and thus have less work opportunities. Women's aspiration is to be able to provide for their families under decent work conditions.

### 8.7.5. Institutions, Mechanisms, Governance

No governance structure is directly supporting the women of Tyre or taking them into account.





## 9. THE WAY FORWARD: TOWARDS SOCIO-ECONOMIC SUSTAINABILITY IN TCNR

Based on the primary and secondary data review, the study suggests a set of policy recommendations to improve the social and economic dimensions of managing the TCNR in future plans and interventions aiming to reinforce local development in Tyre and its surrounding area.

- **Local perception and awareness raising**

Despite all the efforts in the past, there is still a lack of knowledge about the Tyre Coast Nature Reserve. Thus the reserve should start with consultations and awareness raising activities. A communication strategy including a stakeholders' engagement plan and a proposals / complaints mechanism should be set up in order to make sure that information is shared at the right time and through the right channel. The awareness training package provided should be aimed at the different categories of people such as fishermen, farmers, tourism operators, visitors, local residents and local authorities. Additionally, coordination is needed between the different natural reserves at the national and regional levels through the Ministry of Environment to ensure a reciprocal exchange of experiences.

- **Community mobilization and engagement**

The Tyre community has little or no knowledge at all about the reserve and thus has no interest in protecting it. With the awareness campaign mentioned above, the reserve could be the entity which could bring the community members together. The decision-making processes could be a bottom up approach engaging all the community members. The community could then take ownership of the different environmentally friendly interventions and together with the city could protect the reserve from various threats and ensure the sustainability of the intervention and environmental improvements.

- **Fishermen's Livelihood improvement and fisheries sector development**

There is a clear need and priority to provide support for the fishermen in implementing sustainable fishing practices, by introducing them to new techniques and assisting them in buying and renewing their equipment, so that they could then abide by the new laws and regulations. However, finding the best way and adaptive solutions to reduce non-indigenous alien species and controlling their pathways seems to be one of the top priorities of the fishery community. Furthermore, there should be a direct

contact between the fishermen and the reserve's personnel, and this in turn would ensure a better understanding of the needs of the fisheries sector and of the challenges facing the reserve in terms of environmental protection. The fishermen would then become more engaged in protecting the environment and in participating in future activities and in decision-making processes regarding the sector in general and this could lead to more sustainable interventions and long-lasting impacts.

- **Tourism sector development**

It clearly transpires from the current assessment that developing an effective sustainable tourism strategy accompanied by capacity building, especially with regard to eco-tourism and agro-tourism, is also a priority need. Tourism activities should be a fundamental part of the management and partnerships between the reserve and tourism actors so as to initiate changes in attitude towards biodiversity conservation issues. It might be possible to provide effective incentives in order to apply progressive conservation policies and to inspire community involvement in sustainable tourism and community development efforts.

- **Inter-sectorial work and engagement while encouraging women's and youth participation**

The relationship between tourism and fisheries stakeholders can be established through tours/fishing trips with the fishermen; introducing water activities for the benefit of youth (sons and daughters of fishermen) and meals with the fishermen's wives. As the fishermen's syndicate and fishermen's cooperative have been established legally but are not playing their role at the moment, the reserve could become the entity through which the fishermen could establish this linkage with the tourism sector and recreational activities and vice versa. There is a potential for this inter-sectorial engagement if the fishing port were to be annexed to the reserve area which could then ensure better management for the fisheries sector, a positive impact on the environment and on the inter-sectorial engagements. There should be standards and guidelines for the fishermen to follow to ensure better management of all the activities.

More support should be provided and engagement of the different fisheries sector stakeholders should be ensured for sustainable inter-sectorial activities: involving the wholesale fishmonger; fishermen's

cooperative and syndicate, the Ministries of Environment and Public Works and Transport.

In the reserve area, inter-sectorial engagement can be established between the tourism and the agricultural sectors, where the latter can supply the tents in the touristic zone with their products and locally preserved food “Mouneh” could be sold at the reserve office –under the reserve label. The products sold to the tents at the touristic area should be wholesale prices as this would foster the sustainability of this partnership. To ensure sustainable inter-sectorial engagement between tourism and agriculture, the following stakeholders should be engaged in decision-making and/or should also benefit from the different interventions involving the Ministry of Agriculture, Litany Water authority, and the farmers.

- **TCNR governance strengthening and law enforcement**

The reserve should establish a special logo and delimit its boundaries making it clear to everyone where it starts and where it ends. The general public is confused as to whether the reserve includes the

tents area (touristic zone) or not, and whether it extends to Ras El Ain or not. Once the boundaries have been established then access to the reserve can be better monitored as well as any damage to the environment. More trained staff is needed as well as better management in order to ensure better control of the area. The reserve should also focus on using the assets provided by donors and implement the projects already established such as the turtle museum, the marine turtles rescue centre and the eco-path which had been created. The reserve should be able to operate the whole year round without the support of the international and local community. It should be able to have sustainable funding from its different zones of activities: touristic zone- tents; conservation zone (eco activities) and agricultural zone (rent from farmers and produce selling under the reserve’s name). In addition to the entrance fees to the reserve as indicated in the Protected Areas Framework Law No.130/2019, the latter has allowed the reserve’s committees to set entrance fees to be paid by the visitors and to use these fees directly by the committee for the management and preservation of the reserve.





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# ANNEXES

## Annex.1. Key informant interviews guide and proposed list of informants

### Key Informants Interview Guide

Introduction: the facilitator will introduce himself and explain the objective of the KIIs and the socio-economic study.

Date: .....	Key informant name: .....
Location: .....	Organization: .....
Timing: ..... to .....	Title: .....
Interviewer: .....	Phone: .....
Note taker: .....	Email: .....

- Q.1. Describe the role of your organization in the tourism and/or fisheries sector
- Q.2. How do you perceive the environmental state of Tyre and TCNR, namely the natural resources used in tourism and/or fisheries?
- Q.3. Describe the state of the tourism and/or fisheries infrastructure in Tyre and TCNR
- Q.4. How do you perceive the contribution of tourism and/or fisheries to local economic development?
- Q.5. How do you perceive the role of TCNR in terms of local economic development?
- Q.6. Describe the relationship of tourism and/or fisheries stakeholders in Tyre and TCNR with your organization
- Q.7. How do you perceive the relationship between tourism and/or fisheries with other economic sectors?
- Q.8. To what extent do you consider the tourism and/or fisheries value chains to be well-structured and organized in Tyre and TCNR
- Q.9. What are the main challenges facing the tourism and/or fisheries sector today in Tyre and TCNR (including the economic crisis and Covid-19)?
- Q.10. How do you perceive the future of the tourism and/or fisheries sector in the area? What role can be played by youth and women? What complementarities and synergies could be developed between these two sectors and other sectors (fisheries, nature conservation...)

## List of key informants (total of 16 key informants)

#	Organization type	Contact person	Position	Phone	Email
<b>Governmental (3 key informants)</b>					
1	Ministry of Environment, Ecosystems department	Lara Samaha	Head of Department of Ecosystems	03-717127	l.samaha@moe.gov.lb
2	Ministry of Agriculture, Fisheries and wildlife department	Salam Jabbour	Head of the Regional forestry department	03-252372	N/A
3	Ministry of Tourism, Local development office	Petra Obeid	Head of Youth and Local Bodies Department	03-559576	petra.p.obeid@gmail.com
<b>Municipal (1 Key informants)</b>					
4	Tyre Municipality	Salah Khalil Sabraoui	Vice President	07-740443	N/A
<b>Fisheries sector (3 key informants)</b>					
5	Fishermen's Syndicate	Sami Rizk	Vice President	03-160478	N/A
6	Fisherman	Miled Khoury	Fisherman	N/A	N/A
7	Researcher	Ali Badreddine	Freelancer Scientist in marine biology and biodiversity	70- 621889	ali.badreddine@hotmail.com
<b>Tourism and recreation (5 key informants)</b>					
8	Lebanon Diving Centre	Youssef El Jundi	Owner	03-877854	N/A
9	Hotel/resort owner - Al Fanar Auberge	Walid Salha	Owner	07-741111	N/A
10	Sandy beach kiosk owner - Cloud 59	Dalia Farran	Owner	03-238827	N/A
11	Union of Sustainable and Ecotourism Institutions in Lebanon	Pascal Abdallah	Founder	03-218048	pascal@responsiblemobilities.com responsible.mobilities@gmail.com
12	Fisherman and Tourism operator	Majed Bawab	Fisherman	N/A	N/A
<b>NGOs (3 Key informants)</b>					
13	ADR Association d'Aide au Développement Rural	Ali Ezzedine	General Manager	N/A	ali.ezzeddine@adr.org.lb
14	IUCN International Union for the Conservation of Nature	Ziad Samaha	Program Manager	03-933707	ziad.samaha@iucn.org
15	Med Wet Coast Project	Charbel Rizk	Project Manager	03-466615	N/A
<b>Nature reserve (1 Key informant)</b>					
16	Tyre Coast Nature Reserve	Nahed Msayleb	Director	03-287211	nmsayleb@gmail.com



## Annex.2. Knowledge Attitude Practices survey

### A. KAP Survey

Survey # \_\_\_\_\_

Date \_\_\_\_\_

Location \_\_\_\_\_

#### Survey Objectives

Explore the knowledge, attitudes and practices among the stakeholders of Tyre community with focus on fisheries and tourism sectors.

#### Disclaimer

Your answers will not be released to anyone and will remain anonymous. Your name will not be written on the questionnaire or be kept in any other records. Your participation is voluntary and you may choose to stop the interview at any time. Please note that the survey will take no longer than 30 minutes to complete.

### 1. Demographics

- 1.1. Age                    18-25   26-35   36-45   46-55   56-65   >65
- 1.2. Gender                M        F
- 1.3. Marital Status      \_\_\_ Single        \_\_\_ Married        \_\_\_ Divorced        \_\_\_ Widowed
- 1.4. Education level    \_\_\_ Illiterate    \_\_\_ Primary        \_\_\_ Complementary  
                                 \_\_\_ Secondary   \_\_\_ Vocational    \_\_\_ University

### 2. Household

2.1. In which area do you live?

- Tyre                    \_\_\_ Old town    \_\_\_ New town    \_\_\_ Al Bass  
                                 \_\_\_ Al Raml     \_\_\_ Ras El Ain   Other, please specify \_\_\_\_\_
- Surroundings        \_\_\_ Borj El Chemali    \_\_\_ Hammadieyh        \_\_\_ Jour El Nakhl  
                                 \_\_\_ Aabbasiyeh        \_\_\_ Ain Baal     Other, please specify \_\_\_\_\_

2.2. Household size    \_\_\_

2.3. Dependents        \_\_\_

2.4. Composition      \_\_\_ M   <3\_\_   3 to 12\_\_   13 to 17\_\_   18-25\_\_   26-35\_\_   36-45\_\_   46-55\_\_   56-65\_\_   >65\_\_  
                                 \_\_\_ F   <3\_\_   3 to 12\_\_   13 to 17\_\_   18-25\_\_   26-35\_\_   36-45\_\_   46-55\_\_   56-65\_\_   >65\_\_

2.5. Tenure            \_\_\_ Rented apartment    \_\_\_ Rented house            \_\_\_ Owned apartment    \_\_\_ Owned house  
                                 \_\_\_ Other \_\_\_\_\_

2.6. Occupation(s), mention the sector when necessary

- \_\_\_ Full time employee                    \_\_\_\_\_
- \_\_\_ Part time employee                    \_\_\_\_\_
- \_\_\_ Seasonal job                            \_\_\_\_\_
- \_\_\_ Business owner                        \_\_\_\_\_
- \_\_\_ Livelihoods                            \_\_\_\_\_
- \_\_\_ Student
- \_\_\_ Retired
- \_\_\_ Unemployed

2.7. Household income level and composition

Sector	Value in LBP per month
_____	_____
_____	_____

2.8. How do you assess your household access to these services?

	Inexistent	Bad	Average	Good	Very Good
Household water					
Drinking water					
Energy					
Solid waste management					
Waste water and sanitation					
Transportation					

3. Involvement in fisheries sector (ONLY FOR RESPONDENTS INVOLVED IN THE SECTOR)

3.1. Since what age have you been involved in fishing? \_\_\_\_\_

3.2. Is there any other member of your household involved in the fisheries sector? \_\_\_Yes \_\_\_No  
If yes, how many \_\_\_\_\_

3.3. In what type of activities are you involved and why have you chosen them?

ACTIVITY	REASON
___ Wild capture	_____
___ Aquaculture	_____
___ Wholesale	_____
___ Retail	_____
___ Transport and distribution	_____
___ Processing and storage	_____
___ Selling fishing equipment and tools	_____
___ Manufacturing fishing equipment and tools	_____
___ Maintaining fishing equipment and tools	_____

3.4. Membership in social networks and groups

___ Cooperative	_____
___ Syndicate	_____
___ None	_____

3.5. Number, type, size and tenure status of vessels

Type	Size	Tenure (Owned or Rental)
_____	_____	_____
_____	_____	_____

### 3.6. Main fishing methods, equipment, and tools

---



---

### 3.7. Most frequent catch (type and volume) and average selling price (LBP/kg)

Species	Estimated volume per year (in T)	Average Selling price LBP/kg

### 3.8. How is your catch distributed on the market (in %)?

- \_\_\_ Personal consumption \_\_\_\_\_
- \_\_\_ Direct sales to consumers \_\_\_\_\_
- \_\_\_ Direct sales to restaurants/hotels \_\_\_\_\_
- \_\_\_ Wholesale market \_\_\_\_\_
- \_\_\_ Other \_\_\_\_\_

### 3.9. What is the annual cost of your fishing operations and how it is distributed (in LBP)?

- Vessel maintenance \_\_\_\_\_
- Equipment and tools maintenance \_\_\_\_\_
- Purchase of new equipment and tools \_\_\_\_\_
- Energy/fuel \_\_\_\_\_
- Lubricants \_\_\_\_\_
- Labor \_\_\_\_\_
- Transportation \_\_\_\_\_
- Storage \_\_\_\_\_

## 4. Involvement in the tourism sector (ONLY FOR RESPONDENTS INVOLVED IN THE TOURISM SECTOR)

4.1. Since what age (for individuals), what year (for businesses) have you been involved in the tourism and recreation sector? \_\_\_\_\_

4.2. Is there any other member of your household involved in the tourism and recreation sector? \_\_\_Yes \_\_\_No  
If yes, how many \_\_\_\_\_

4.3. In what type of activities are you involved and why have you chosen them?

ACTIVITY	TYPE	REASON
___Accommodation	_____	_____
___Food and beverage	_____	_____
___Transportation	_____	_____
___Travel agency	_____	_____
___Tour operator	_____	_____
___Guiding	_____	_____
___Recreational activities	_____	_____
Other _____	_____	_____

4.4. Are you the owner of the business or an employee?  Owner  Full time employee  
 Part time employee  Seasonal employee

4.5. If employee, what is your position/responsibilities? \_\_\_\_\_

4.6. Do you have any educational degree related to the tourism/recreational activity you work in?  Yes  No  
If yes, please specify \_\_\_\_\_

4.7. Membership in social networks and groups

Cooperative \_\_\_\_\_  
 Syndicate \_\_\_\_\_  
 Others \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4.8. What is the average number of yearly users/visitors of your business (for owners only)?

Accommodation \_\_\_\_\_  
 Food and beverage \_\_\_\_\_  
 Transportation \_\_\_\_\_  
 Travel agency \_\_\_\_\_  
 Tour operator \_\_\_\_\_  
 Guiding \_\_\_\_\_  
 Recreational activities \_\_\_\_\_  
Other \_\_\_\_\_

4.9. What is the annual income (business) or annual salary (employee) you make from tourism and recreational services and activities (in LBP)?

Accommodation \_\_\_\_\_  
 Food and beverage \_\_\_\_\_  
 Transportation \_\_\_\_\_  
 Travel agency \_\_\_\_\_  
 Tour operator \_\_\_\_\_  
 Guiding \_\_\_\_\_  
 Recreational activities \_\_\_\_\_  
Other \_\_\_\_\_

## 5. KNOWLEDGE

5.1. Have you heard about Tyre Coast Nature Reserve?  Yes  No  
If no the survey will end

5.2. Do you know when was TCNR created?  Yes  No If yes, when \_\_\_\_\_

5.3. Have you ever had the chance to read the Law of TCNR? Yes No

If yes, do you remember any specific part of it \_\_\_\_\_  
\_\_\_\_\_

5.4. Do you know the main conservation and development objectives of TCNR? Yes No

If yes, explain \_\_\_\_\_  
\_\_\_\_\_

5.5. Do you know the boundaries of the TCNR? Yes No

If yes, mention them \_\_\_\_\_  
\_\_\_\_\_

Or draw on a map (To Insert Tyre Map)

5.6. Do you know the surface area of TCNR? Yes No

If yes, what is the area in square meters \_\_\_\_\_

5.7. Do you know how many zones the TCNR have and what differs between them? Yes No

If yes, mention the zones and explain the difference (what activities are allowed/not allowed)

Zone 1 \_\_\_\_\_

Zone 2 \_\_\_\_\_

Zone 3 \_\_\_\_\_

5.8. Do you know any of the emblematic/endemic terrestrial and/or aquatic species that distinguishes TCNR and their specific location?

Yes No

Species common name (Arabic or English)	Scientific name	Location(s)
_____	_____	_____
_____	_____	_____

5.9. Do you know who manages the TCNR and how it is managed? Yes No

If yes, explain \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

5.10. Do you know if there are ecological sensitive areas and species in TCNR? Yes No

If yes, mention them \_\_\_\_\_  
\_\_\_\_\_

5.11. Do you know if TCNR have any designation(s) for ecological/environmental characteristics of international importance? Yes No

If yes, name them \_\_\_\_\_  
\_\_\_\_\_

## 6. ATTITUDE

6.1. Rate the following on a scale from 1 to 5, and explain your choice

1 Not important 2 Little importance 3 Neutral 4 Important 5 Extremely important

	1	2	3	4	5
TCNR role in the conservation of natural resources and biodiversity in Tyre					
TCNR role in the conservation of the visual landscape in Tyre					
TCNR role in the economic development of Tyre					
TCNR role in the socio-economic development of Tyre in south Lebanon					
TCNR role in the socio-economic development of Tyre in Lebanon					
TCNR role and the environmental conservation of Tyre in south Lebanon					
TCNR role in the environmental conservation of Tyre in Lebanon					

6.2. Do you feel that there are threats on TCNR? \_\_\_Yes \_\_\_No

If yes, describe the threats and what should be done to reduce them

Threat

Measure(s) to reduce it(them)

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

## 7. PRACTICES

7.1. Do you use any resource or practice any activities within the TCNR areas? \_\_\_Yes \_\_\_No

If yes, explain what resources and/or activities and in which area they take place, and their frequency (permanent, seasonal, occasional, etc.)

Activity/Resource use

Area

Frequency

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

7.2. Do you take into consideration the environmental sensitivity of the area when practicing your activities?

\_\_\_Yes \_\_\_No

If yes, explain

Activity

Measure(s)

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

## Annex.3. Projects Implemented in TCNR

#	Project Name	Funded by	Implemented by	Implementation Period	Project Objective
1	Mediterranean Action Plan (MAP) for the Conservation of Marine Turtles	Mediterranean Association to Save the Sea Turtles MEDASSET	UNEP- MAP- RAC/SPA ; MEDASSET; Project for the Conservation of Wetlands and Coastal Ecosystems in the Mediterranean Region (MEDWETCOAST)	2005	Monitoring of Sea Turtles.
2	Socio-economic development of the Fishing Community of Tyre, Lebanon: Commercial landing and fishing métiers within the artisanal fishery of Tyre, Lebanon.	Italian Ministry of Foreign Affairs	Italian NGO 'Ricerca e Cooperazione' in collaboration with Caritas Lebanon	2005-2006	
3	MedWetCoast: Project for the Conservation of Wetlands and Coastal Ecosystems in the Mediterranean region	French Global Environment Facility (FFEM) Project Coordination hosted by Tour du Valat	MedWet ; United Nations Development Programme (UNDP) ; MoE Lebanon	1999-2006	"To conserve globally endangered species and their habitat, recognising wildlife conservation as an integral part of sustainable human development, while improving capacity of government and non-government agencies to address biodiversity conservation issues" Conserving wetland and coastal biodiversity of global and regional importance of six countries in the Mediterranean basin. Development of fields and methods in the fields of capacity building and application of the results of research.
4	Appui aux reserves naturelles du Liban (Support for natural reserves in Lebanon)	FFEM and AFD	TCNR	2009-2012	
5	Mare Nostrum project	European Union	Paralleli Institute	2010	the Paralleli Institute has the task of conducting an initial reconnaissance-mapping in Rhodes (Greece) and Tyre (Lebanon), two cities where during a second phase the technique of participative planning will be tested. The objective of the mapping is to provide a detailed and concise picture of the situation in the two cities from the perspective of tourism in order to prepare a report that identifies the problems, but also the strong points of the sector. A second correlated aim is to provide some valuable ideas for the construction of possible alternative/ sustainable tourist routes in the two cities to connect the so-called "waterfront" to the major archaeological sites.

6	Capacity Building Programme for monitoring and exchange visits	MedPAN	TCNR	2010-2012	
7	Supporting the Management of Important Marine Habitats and Species in Lebanon		Ministry of Environment and the IUCN - Centre Malaga, Spain (IUCN – MED),	2011-2013	
8	Scientific and Institutional Cooperation to Support Responsible Fisheries in the Eastern Mediterranean - EastMed	Greece, Italy and EC	FAO	2012	This study was implemented after the EastMed 2 <sup>nd</sup> co-ordination meeting on the 5-6 <sup>th</sup> April, Antalya, Turkey (EastMed 2012), where the participants agreed to have a Preliminary assessment of the economic situation of the Lebanese fisheries sector.
9	Satellite tracking of two Sea Turtles in South Lebanon	Regional Action Centre of Specially Protected Areas (RAC/SPA) and Tyre Municipality	TCNR	2012	
10	MEET Project	EU-ENPI	TCNR	2013-2015	
11	Sustainable Fisheries Management for Improved Livelihoods of the Coastal Fishing Community in Tyre, South Lebanon	Drosos funded project, in partnership with IUCN ROWA as the project leader	ADR	2014-2017	Objective 1 Livelihoods security & Empowerment Improved livelihood security of fishermen and their families through sustainable and decentralized governance of natural resources and use of additional income resources; Objective 2 Tyre Marine Management and Protection Empower TCNR to improve conservation efforts and establish locally managed marine area; Objective 3 Sustainable marine ecosystem management Empowered Stakeholders on marine management planning and change process for effective and sustainable management of marine ecosystems;



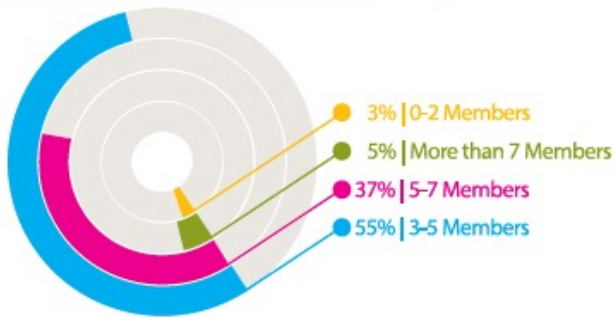
12	MedMPAnet Project: Regional Project for the Development of a Mediterranean Marine and Coastal Protected Areas (MPAs) Network through the boosting of MPA creation and management	EC, AECID and FFEM.	Regional Activity Centre for Specially Protected Areas (RAC/SPA)	2015	To enhance the effective conservation of regionally important coastal and marine biodiversity features, through the creation of an ecologically coherent MPA network in the Mediterranean region, as required by Barcelona Convention's Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol).
13	Develop and sustain Tyre's underwater natural and heritage snorkeling trails	MedPAN, ARESMAR and Tyre Municipality	TCNR	2015-2016	
14	Master Plan for the Sustainable Development of the Lebanese Coast	Italian Ministry of Foreign Affairs (MAEC/DGCS) through the Italian Agency for Development Cooperation (AICS)	CIHEAM Bari and the Lebanese Council for Development and Reconstruction (CDR), in partnership with the Lebanese Ministry of Agriculture	2017-2018	The Project aims at supporting the sustainable development of 7 Lebanese coastal communities -Batroun, Bebnine-Abdeh, Byblos, El Mina, Entfeh, Sarafand and Tyre - promoting the dimensions of economic, social and environmental sustainability, through the elaboration of 7 Coastal Areas Local Sustainable Development Plans.
15	Design and Install Marah Tyre Coast Nature Reserve Hub to activate TCNR local activities	American University of Beirut	TCNR	2017	
16	NEMO project - Mediterranean Coastal Communities	Italian Cooperation	CIHEAM Bari in collaboration with the MoA and main local actors (TCNR, Municipality of Tyre, Union of Municipalities of Tyre province, LAG, TYROS, Mosan Centre, Syndicate and Cooperative of fishermen).	2018-2019	Contributing to the inclusive and sustainable development of the Mediterranean region, improving the living conditions as well as the socio-economic opportunities of coastal communities
17	Coastal Management and Monitoring Network for Tackling marine litter in the Mediterranean Sea. (COMMON)	ENI CBC MED project	TCNR	Ongoing	Apply ICZM principles to the marine litter management in 5 pilot coastal areas through local coordination and Mediterranean networking among different stakeholders.
18	Mediterranean forum for applied Ecosystem-Based Management (MED4EBM)	ENI CBC MED project	TCNR	Ongoing	

19	Co-Evolution of coastal human activities & Med natural systems for sustainable tourism & Blue Growth in the Mediterranean (CoEvolve4BG)	ENI CBC MED project	TCNR as Associated Partner	Ongoing	
20	Towards achieving a good environmental status of the Mediterranean Sea and coast through an ecologically representative and efficiently managed and monitored network of marine protected areas" ("IMAP-MPA Project"). *This study is under this project.	European Union	UNEP/MAP and executed through its Programme for Assessment and Control of Marine Pollution in the Mediterranean Region (MED POL) and the Regional Activity Centre for Specially Protected Areas (SPA/RAC)	Ongoing	The main objective of the IMAP-MPA Project is to contribute to the achievement of the Good Environmental Status (GES) of the Mediterranean Sea and coasts. Thus, this project proposes to consolidate, integrate, and strengthen the Ecosystem Approach (EcAp) for the management of Marine Protected Areas (MPAs) and their sustainable development. This will be achieved by monitoring and assessing the ecological status of the Mediterranean Sea and its coastline, including MPAs, in a comparative and integrated manner.

## Annex.4. Fisheries Sector Tyre Value Chain

### FISHERMEN & THEIR HOUSEHOLDS

#### Number of Household Members



#### Households Earning vs Spending

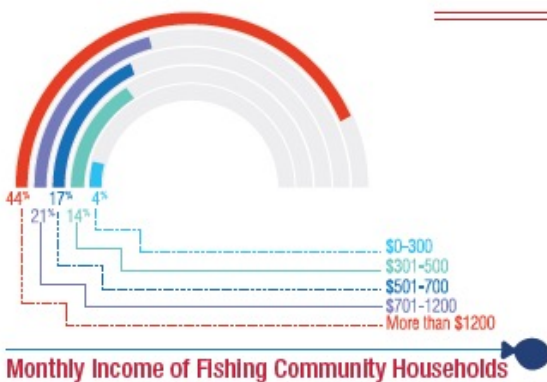
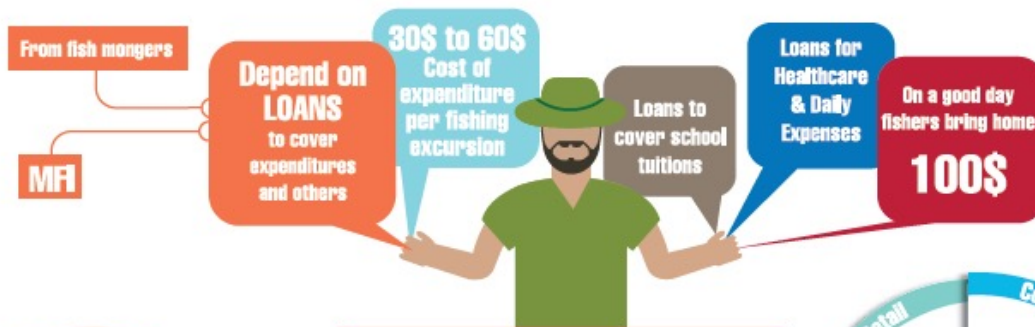
**73%**  
Spend over  
700USD

**61%**  
Earn  
500USD

**Household Debt: 3008 USD**

{ However 45% of households claim they do not have any debt }

#### Fishermen and Expenditures

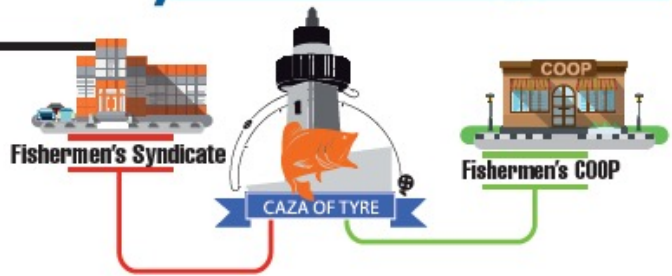


Source: (Halabi, 2016)

# FISHERY SECTOR

## Collective Organizations

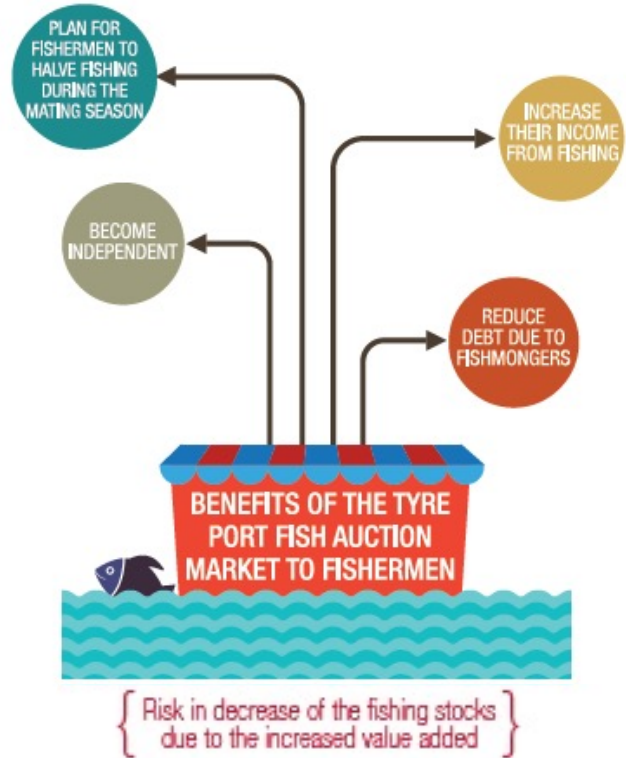
### Fishermen's fixed asset in Tyre Caza



## Retailers

No direct selling due to the dependency on fishmongers and lack of a formal fish market

### Wholesale Fishmongers



Source: (Halabi, 2016)

## Annex.5. Knowledge questions and responses (KAP survey)

Question/correct answer	Fishermen	Tourism operators	Farmers	Household members	All respondents
Do you know when was TCNR created?	Yes: 60% No: 40%	Yes: 67% No: 33%	Yes: 42% No: 58%	Yes: 40% No: 60%	Yes: 52% No: 48%
If yes when? <b>1998</b>	Correct: 0% Incorrect: 100%	Correct: 0% Incorrect: 100%	Correct: 0% Incorrect: 100%	Correct: 13% Incorrect: 87%	Correct: 3% Incorrect: 97%
Have you ever had the chance to read the Law of TCNR?	Yes: 45% No: 55%	Yes: 50% No: 50%	Yes: 40% No: 60%	Yes: 40% No: 60%	Yes: 43% No: 57%
If yes, do you remember any specific part of it: <b>Attributing a Legal Status to the reserves, which entitles them to own and register assets (vehicles, buildings, boats, etc....), delimitating its borders and determining the management system</b>	Correct: 0% Incorrect: 100%	Correct: 0% Incorrect: 100%	Correct: 0% Incorrect: 100%	Correct: 0% Incorrect: 100%	Correct: 0% Incorrect: 100%
Do you know the main conservation and development objectives of TCNR?	Yes: 45% No: 55%	Yes: 61% No: 39%	Yes: 47% No: 53%	Yes: 84% No: 16%	Yes: 58% No: 42%
If yes, explain: <b>to conserve the 4 ecosystems existing at the reserve, and their pertaining biodiversity</b>	Partially correct: 100%	Partially correct: 100%	Partially correct: 100%	Partially correct: 100%	Partially correct: 100%
Do you know the surface area (in Km <sup>2</sup> ) and the boundaries of the TCNR?	Yes: 60% No: 40%	Yes: 83% No: 17%	Yes: 74% No: 26%	Yes: 75% No: 25%	Yes: 73% No: 27%
If yes, mention them: Terrestrial section: <b>3.8 km<sup>2</sup>; Marine section: 113 km<sup>2</sup></b>	Correct: 0% Incorrect: 100%	Correct: 0% Incorrect: 100%	Correct: 0% Incorrect: 100%	Correct: 7% Incorrect: 93%	Correct: 2% Incorrect: 98%
Do you know how many zones the TCNR have and what differs between them?	Yes: 25% No: 75%	Yes: 33% No: 67%	Yes: 21% No: 79%	Yes: 50% No: 50%	Yes: 32% No: 68%
If yes, mention the zones: <b>Zone 1: Touristic zone: public sandy beach, allowing to exert recreational beach activities; Zone 2: Conservation zone: restricted/ to research and fauna &amp; flora monitoring and conservation, and limited/ controlled visits; Zone 3: Agricultural zone: farming, irrigation with water coming from the ponds of Ras El Ain, which also provides domestic water to Tyre city and its surrounding villages; Zone 4: Marine zone: facing the land zones of the reserve until the territorial waters. Only artisanal fishing is allowed, with recreational diving and small boats' tour making.</b>	Correct: 0% Incorrect: 100%	Correct: 34% Incorrect: 66%	Correct: 0% Incorrect: 100%	Correct: 20% Incorrect: 80%	Correct: 16% Incorrect: 84%

Question/correct answer	Fishermen	Tourism operators	Farmers	Household members	All respondents
Do you know any of the emblematic/endermic terrestrial and/or aquatic species that distinguishes TCNR and their specific location	<b>Fishermen</b> Yes: 40% No: 60%	<b>Tourism operators</b> Yes: 55% No: 45%	<b>Farmers</b> Yes: 44% No: 56%	<b>Household members</b> Yes: 75% No: 25%	<b>All respondents</b> Yes: 53% No: 47%
If yes, please specify: <b>Loggerhead sea turtles - <i>Caretta caretta</i> nesting at the sandy beach and living in the sea of Tyre; Green sea turtles - <i>Chelonia mydas</i> living in the sea of Tyre; Sea daffodil or sand lily - <i>Pancratium maritimum</i> .found on the sand dunes of the conservation zone</b>	Partially correct: 100% Incorrect: 0%	Partially correct: 100% Incorrect: 0%	Partially correct: 38% Incorrect: 62%	Partially correct: 73% Incorrect: 27%	<b>Partially correct: 78% Incorrect: 22%</b>
?Do you know who manages the TCNR and how it is managed	Partially correct: 100% Incorrect: 0%	Partially correct: 100% Incorrect: 0%	Partially correct: 38% Incorrect: 62%	Partially correct: 73% Incorrect: 27%	<b>Partially correct: 78% Incorrect: 22%</b>
If yes, explain: <b>An administrative committee composed of 5 volunteering members and headed by a president (usually the mayor of Tyre) is appointed by the Minister of Environment and is responsible for handling the overall administrative decision about the reserve. In addition, an executive management team of 7 employees is formed, consisting of a manager, an assistant manager, an administrative assistant, 3 rangers and one dustman/refuse collector, and is responsible for the executive management of the reserve, fund raising, communication with the local communities, implementation of activities and conducting scientific research, conservation of the reserve and protection of its biodiversity, development of the services at the reserve, and implementing and updating the reserve's management plan. The management team reports to the administrative committee, which in turn reports to the Ministry of Environment as the Governing Authority of .reference for the reserves and protected areas in Lebanon</b>	Yes: 35% No: 65%	Yes: 67% No: 33%	Yes: 79% No: 21%	Yes: 55% No: 45%	<b>Yes: 58% No: 42%</b>
?Do you know if there are ecological sensitive areas and species in TCNR	Correct: 0% Incorrect: 100%	Correct: 0% Incorrect: 100%	Correct: 0% Incorrect: 100%	Correct: 0% Incorrect: 100%	Correct: 0% Incorrect: 100%
If yes, mention them: <b>Sand dunes ecosystem, the last of its kind in Lebanon; TCNR wetland, for which the reserve was classified as a Ramsar site; The water resources of Ras El Ain; The estuary emerging from the natural springs of Ras El Ain and flowing out into the sea; Marine zone of the reserve, which is a suitable habitat for 2 endangered species of sea turtles and other marine .species</b>	Yes: 35% No: 65%	Yes: 50% Yes: 50%	Yes: 55% No: 45%	Yes: 45% No: 55%	<b>Yes: 46% No: 54%</b>
Do you know if TCNR have any designation(s) for ecological/environmental ?characteristics of international importance	Partially correct: 100%	Partially correct: 100%	Partially correct: 100%	Partially correct: 100%	Partially correct: 100%
If yes, name them: <b>Ramsar site (wetland); SPAMI (Specially Protected Area of Mediterranean Importance) since 2013; IBA-to be (Important Bird Area, being considered); Belongs to Tyre city, designated as World Heritage Site by .UNESCO</b>	Yes: 25% No: 75%	Yes: 50% No: 50%	Yes: 32% No: 68%	Yes: 50% No: 50%	<b>Yes: 39% No: 61%</b>



**Mediterranean  
Action Plan**  
Barcelona  
Convention



*The Mediterranean  
Biodiversity  
Centre*

Specially Protected Areas Regional Activity Centre (SPA/RAC)  
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